



Bio-Formats Documentation

Release 5.1.3

The Open Microscopy Environment

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Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](#) or the [previous versions²](#) page to find documentation for the version you are using.

The following documentation is split into four parts. *About Bio-Formats* explains the goal of the software, discusses how it processes metadata, and provides other useful information such as version history and how to report bugs. *User Information* focuses on how to use Bio-Formats as a plugin for ImageJ and Fiji, and also gives details of other software packages which can use Bio-Formats to read and write microscopy formats. *Developer Documentation* covers more indepth information on using Bio-Formats as a Java library and how to interface from non-Java codes. Finally, *Formats* is a guide to all the file formats currently supported by Bio-Formats.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³](#) or the [previous versions⁴](#) page to find documentation for the version you are using.

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴<http://www.openmicroscopy.org/site/support/legacy/>

Part I

About Bio-Formats

Bio-Formats is a standalone Java library for reading and writing life sciences image file formats. It is capable of parsing both pixels and metadata for a large number of formats, as well as writing to several formats.

The primary goal of Bio-Formats is to facilitate the exchange of microscopy data between different software packages and organizations. It achieves this by converting proprietary microscopy data into an open standard called the [OME data model](#)⁵, particularly into the [OME-TIFF](#)⁶ file format.

We believe the standardization of microscopy metadata to a common structure is of vital importance to the community. You may find LOCI's article on [open source software in science](#)⁷ of interest.

⁵<http://genomebiology.com/2005/6/5/R47>

⁶<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff>

⁷<http://loci.wisc.edu/software/oss>

There is a *[guide for reporting bugs here](#)*.

For help relating to opening images in ImageJ or FIJI or when using the command line tools, refer to the *[users documentation](#)*. You can also find tips on common issues with specific formats on the pages linked from the *[supported formats table](#)*.

Please [contact us](#)¹ if you have any questions or problems with Bio-Formats not addressed by referring to the documentation.

Other places where questions are commonly asked and/or bugs are reported include:

- [OME Trac](#)²
- [ome-devel mailing list](#)³ (searchable using google with 'site:lists.openmicroscopy.org.uk')
- [ome-users mailing list](#)⁴ (searchable using google with 'site:lists.openmicroscopy.org.uk')
- ImageJ mailing list (for ImageJ/Fiji issues) [forum archive](#)⁵ and [mailing list](#)⁶
- [ImageJ developer mailing list](#)⁷
- [Fiji Bugzilla](#) (for ImageJ/Fiji issues)⁸
- [Fiji developer google group](#)⁹
- [Confocal microscopy mailing list](#)¹⁰

¹<http://www.openmicroscopy.org/site/community/mailing-lists>

²<http://trac.openmicroscopy.org.uk/ome>

³<http://lists.openmicroscopy.org.uk/pipermail/ome-devel>

⁴<http://lists.openmicroscopy.org.uk/pipermail/ome-users>

⁵<http://imagej.1557.n6.nabble.com/>

⁶<http://imagej.nih.gov/ij/list.html>

⁷<http://imagej.net/mailman/listinfo/imagej-devel>

⁸<http://fiji.sc/cgi-bin/bugzilla/index.cgi>

⁹<https://groups.google.com/forum/#!forum/fiji-devel>

¹⁰<http://lists.umn.edu/cgi-bin/wa?A0=confocalmicroscopy>

BIO-FORMATS VERSIONS

Bio-Formats is now decoupled from OMERO with its own release schedule rather than being updated whenever a new version of [OMERO](#)¹ is released. We expect this to result in more frequent releases to get fixes out to the community faster.

The version number is three numbers separated by dots e.g. 4.0.0. See the [version history](#) for a list of major changes in each release.

¹<http://www.openmicroscopy.org/site/support/omero5.1/>

WHY JAVA?

From a practical perspective, Bio-Formats is written in Java because it is cross-platform and widely used, with a vast array of libraries for handling common programming tasks. Java is one of the easiest languages from which to deploy cross-platform software. In contrast to C++, which has a large number of complex platform issues to consider, and Python, which leans heavily on C and C++ for many of its components (e.g., NumPy and SciPy), Java code is compiled one time into platform-independent byte code, which can be deployed as is to all supported platforms. And despite this enormous flexibility, Java manages to provide time performance nearly equal to C++, often better in the case of I/O operations (see further discussion on the [comparative speed of Java on the LOCI site](http://loci.wisc.edu/faq/isnt-java-too-slow)¹).

There are also historical reasons associated with the fact that the project grew out of work on the [VisAD Java component library](http://visad.ssec.wisc.edu)². You can read more about the origins of Bio-Formats on the [LOCI Bio-Formats homepage](http://loci.wisc.edu/software/bio-formats)³.

¹<http://loci.wisc.edu/faq/isnt-java-too-slow>

²<http://visad.ssec.wisc.edu>

³<http://loci.wisc.edu/software/bio-formats>

BIO-FORMATS METADATA PROCESSING

Pixels in microscopy are almost always very straightforward, stored on evenly spaced rectangular grids. It is the metadata (details about the acquisition, experiment, user, and other information) that can be complex. Using the OME data model enables applications to support a single metadata format, rather than the multitude of proprietary formats available today.

Every file format has a distinct set of metadata, stored differently. Bio-Formats processes and converts each format's metadata structures into a standard form called the [OME data model](#)¹, according to the [OME-XML](#)² specification. We have defined an open exchange format called [OME-TIFF](#)³ that stores its metadata as OME-XML. Any software package that supports OME-TIFF is also compatible with the dozens of formats listed on the Bio-Formats page, because Bio-Formats can convert your files to OME-TIFF format.

To facilitate support of OME-XML, we have created a [library in Java](#)⁴ for reading and writing [OME-XML](#)⁵ metadata.

There are three types of metadata in Bio-Formats, which we call core metadata, original metadata, and OME metadata.

1. **Core metadata** only includes things necessary to understand the basic structure of the pixels: image resolution; number of focal planes, time points, channels, and other dimensional axes; byte order; dimension order; color arrangement (RGB, indexed color or separate channels); and thumbnail resolution.
2. **Original metadata** is information specific to a particular file format. These fields are key/value pairs in the original format, with no guarantee of cross-format naming consistency or compatibility. Nomenclature often differs between formats, as each vendor is free to use their own terminology.
3. **OME metadata** is information from #1 and #2 converted by Bio-Formats into the OME data model. **Performing this conversion is the primary purpose of Bio-Formats.** Bio-Formats uses its ability to convert proprietary metadata into OME-XML as part of its integration with the OME and OMERO servers—essentially, they are able to populate their databases in a structured way because Bio-Formats sorts the metadata into the proper places. This conversion is nowhere near complete or bug free, but we are constantly working to improve it. We would greatly appreciate any and all input from users concerning missing or improperly converted metadata fields.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶ or the [previous versions](#)⁷ page to find documentation for the version you are using.

4.1 Reporting a bug

4.1.1 Before filing a bug report

If you think you have found a bug in Bio-Formats, the first thing to do is update your version of Bio-Formats to the latest version to check if the problem has already been addressed. The Fiji updater will automatically do this for you, while in ImageJ you can select *Plugins* → *Bio-Formats* → *Update Bio-Formats Plugins*.

You can also download the [latest version of Bio-Formats](#)⁸. If you are not sure which version you need, select the latest build of the Bio-Formats package bundle from the components table.

¹<http://genomebiology.com/2005/6/5/R47>

²<http://www.openmicroscopy.org/site/support/ome-model/ome-xml>

³<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff>

⁴<http://www.openmicroscopy.org/site/support/ome-model/ome-xml/java-library.html>

⁵<http://www.openmicroscopy.org/site/support/ome-model/ome-xml>

⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

4.1.2 Common issues to check

- If your 12, 14 or 16-bit images look all black when you open them, typically the problem is that the pixel values are very, very small relative to the maximum possible pixel value (4095, 16383, and 65535, respectively), so when displayed the pixels are effectively black. In ImageJ/Fiji, this is fixable by checking the “Autoscale” option; with the command line tools, the “-autoscale -fast” options should work.
- If the file is very, very small (4096 bytes) and any exception is generated when reading the file, then make sure it is not a [Mac OS X resource fork](#)⁹. The ‘file’ command should tell you:

```
$ file /path/to/suspicious-file
suspicious-file: AppleDouble encoded Macintosh file
```

- If you get an `OutOfMemory` or `NegativeArraySize` error message when attempting to open an SVS or JPEG-2000 file then the amount of pixel data in a single image plane exceeds the amount of memory allocated to the JVM (Java Virtual Machine) or 2 GB, respectively. For the former, you can increase the amount of memory allocated; in the latter case, you will need to open the image in sections. If you are using Bio-Formats as a library, this means using the `openBytes(int, int, int, int, int)` method in `loci.formats.IFormatReader`. If you are using Bio-Formats within ImageJ, you can use the *Crop on import* option.

Note that JPEG-2000 is a very efficient compression algorithm - thus the size of the file on disk will be substantially smaller than the amount of memory required to store the uncompressed pixel data. It is not uncommon for a JPEG-2000 or SVS file to occupy less than 200 MB on disk, and yet have over 2 GB of uncompressed pixel data.

4.1.3 Sending a bug report

If you can still reproduce the bug after updating to the latest version of Bio-Formats, and your issue does not relate to anything listed above or noted on the relevant file format page, please send a bug report to the [OME Users mailing list](#)¹⁰. You can upload files to our [QA system](#)¹¹ or for large files (>2 GB), we can provide you with an FTP server address if you write to the mailing list.

To ensure that any inquiries you make are resolved promptly, please include the following information:

- **Exact error message.** Copy and paste any error messages into the text of your email. Alternatively, attach a screenshot of the relevant windows.
- **Version information.** Indicate which release of Bio-Formats, which operating system, and which version of Java you are using.
- **Non-working data.** If possible, please send a non-working file. This helps us ensure that the problem is fixed for next release and will not reappear in later releases. Note that any data provided is used for internal testing only; we do not make images publicly available unless given explicit permission to do so.
- **Metadata and screenshots.** If possible, include any additional information about your data. We are especially interested in the expected dimensions (width, height, number of channels, Z slices, and timepoints). Screenshots of the image being successfully opened in other software are also useful.
- **Format details.** If you are requesting support for a new format, we ask that you send as much data as you have regarding this format (sample files, specifications, vendor/manufacture information, etc.). This helps us to better support the format and ensures future versions of the format are also supported.

Please be patient - it may be a few days until you receive a response, but we reply to *every* email inquiry we receive.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹² or the [previous versions](#)¹³ page to find documentation for the version you are using.

⁹http://en.wikipedia.org/wiki/Resource_fork#The_Macintosh_file_system

¹⁰<http://lists.openmicroscopy.org.uk/mailman/listinfo/ome-users>

¹¹<http://qa.openmicroscopy.org.uk/qa/upload/>

¹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³<http://www.openmicroscopy.org/site/support/legacy/>

4.2 Version history

4.2.1 5.1.3 (2015 July 21)

- **Native C++ updates:**
 - Added cmake superbuild to build core dependencies (zlib, bzip2, png, icu, xerces, boost)
 - Progress on support for Windows
- **Bug fixes, including:**
 - Fixed segfault in the *showinf* tool used with the C++ bindings
 - Allow reading from https URLs
 - **ImageJ**
 - * improved performance of displaying ROIs
 - **Command line tools**
 - * fixed bfconvert to correctly create datasets with multiple files
 - **Metamorph**
 - * improved detection of time series
 - * fixed .nd datasets with variable Z and T counts in each channel
 - * fixed .nd datasets that contain invalid TIFF/STK files
 - * fixed dimensions when the number of planes does not match the recorded Z, C, and T sizes
 - **SlideBook**
 - * improved native library detection (thanks to Richard Myers)
 - **JPEG**
 - * fixed decompression of lossless files with multiple channels (thanks to Aaron Avery)
 - **Inspector OBF**
 - * updated to support version 2 files (thanks to Bjoern Thiel)
 - **Inspector MSR**
 - * improved detection of Z stacks
 - **PerkinElmer Opera Flex**
 - * improved handling of multiple acquisitions of the same plate
 - **Zeiss CZI**
 - * fixed error when opening single-file datasets whose names contained “(” and ”)”
 - **TIFF**
 - * improved speed of reading files with many tiles
 - **AVI**
 - * updated to read frame index (idx1) tables
 - **Nikon ND2**
 - * fixed channel counts for files with more than 3 channels
 - **PNG**
 - * fixed decoding of interlaced images with a width or height that is not a multiple of 8
 - **PSD**
 - * improved reading of compressed images

- **Documentation improvements, including:**
 - updated instructions for writing a new file format reader
 - updated usage information for command line tools
 - new Javadocs for the *MetadataStore* and *MetadataRetrieve* interfaces

4.2.2 5.1.2 (2015 May 28)

- Added OME-TIFF writing support to the native C++ implementation
- OME-TIFF export: switch to BigTIFF if .ome.tf2, .ome.tf8, or .ome.btf extensions are used
- Improved MATLAB developer documentation
- Added SlideBook reader that uses the SDK from 3I (thanks to Richard Myers and [3I - Intelligent Imaging Innovations](https://www.intelligent-imaging.com)¹⁴)
- Preliminary work to make MATLAB toolbox work with Octave
- **Many bug fixes, including:**
 - **ImageJ**
 - * fixed regression in getPlanePosition* macro extension methods
 - * fixed display of composite color virtual stacks
 - **Nikon ND2**
 - * improved parsing of plane position and timestamp data
 - **TIFF**
 - * reduced memory required to read color lookup tables
 - **Zeiss LSM**
 - * improved parsing of 16-bit color lookup tables
 - **Zeiss CZI**
 - * fixed ordering of original metadata table
 - * fixed reading of large pre-stitched tiled images
 - **AIM**
 - * fixed handling of truncated files
 - **Metamorph/MetaXpress TIFF**
 - * improved UIC1 metadata tag parsing

4.2.3 5.1.1 (2015 April 28)

- Add TIFF writing support to the native C++ implementation
- Fixed remaining functional differences between Windows and Mac/Linux
- Improved performance of ImageJ plugin when working with ROIs
- TIFF export: switch to BigTIFF if .tf2, .tf8, or .btf extensions are used
- **Many bug fixes, including:**
 - fixed upgrade checking to more accurately report when a new version is available
 - **Zeiss CZI**
 - * fixed ordering of multiposition data
 - * improved support for RGB and fused images

¹⁴<https://www.intelligent-imaging.com>

- **Nikon ND2**
 - * improved ordering of multiposition data
- **Leica LIF**
 - * improved metadata validity checks
 - * improved excitation wavelength detection
- **Metamorph STK/TIFF**
 - * record lens numerical aperture
 - * fixed millisecond values in timestamps
- **Gatan DM3**
 - * correctly detect signed pixel data
- **Imaris HDF**
 - * fix channel count detection
- **ICS export**
 - * fix writing of files larger than 2GB

4.2.4 5.1.0 (2015 April 2)

- Improvements to performance with network file systems
- Improvements to developer documentation
- Initial version of *native C++ implementation*
- Improved support for opening and saving ROI data with ImageJ
- Added support for *CellH5* data (thanks to Christophe Sommer)
- Added support for *Perkin Elmer Nuance* data (thanks to Lee Kamentsky)
- Added support for *Amnis FlowSight* data (thanks to Lee Kamentsky and Sebastien Simard)
- Added support for *Veeco AFM* data
- Added support for *Zeiss .lms* data (not to be confused with .lsm)
- Added support for *I2I* data
- Added support for writing Vaa3D data (thanks to Brian Long)
- Updated to *OME schema 2015-01*¹⁵
- Update RandomAccessInputStream and RandomAccessOutputStream to read and write bits
- **Many bug fixes, including:**
 - **Leica SCN**
 - * fix pixel data decompression
 - * fix handling of files with multiple channels
 - * parse magnification and physical pixel size data
 - **Olympus/CellSens .vsi**
 - * more thorough parsing of metadata
 - * improved reading of thumbnails and multi-resolution images
 - **NDPI**
 - * fix reading of files larger than 4GB

¹⁵<http://www.openmicroscopy.org/site/support/ome-model/schemas/january-2015.html>

- * parse magnification data
- **Zeiss CZI**
 - * improve parsing of plane position coordinates
- **Inveon**
 - * fix reading of files larger than 2 GB
- **Nikon ND2**
 - * many improvements to dimension detection
 - * many improvements to metadata parsing accuracy
 - * update original metadata table to include PFS data
- **Gatan DM3**
 - * fix encoding when parsing metadata
 - * fix physical pixel size parsing
- **Metamorph**
 - * fix off-by-one in metadata parsing
 - * fix number parsing to be independent of the system locale
- **JPEG**
 - * parse EXIF data, if present (thanks to Paul Van Schayck)
- **OME-XML/OME-TIFF**
 - * fix handling of missing image data
- **PrairieView**
 - * improved support for version 5.2 data (thanks to Curtis Rueden)
- **DICOM**
 - * fix dimensions for multi-file datasets
 - * fix pixel data decoding for files with multiple images
- **PNG**
 - * reduce memory required to read large images
- **Inspector OBF**
 - * fix support for version 5 data (thanks to Bjoern Thiel)
- **PCORAW**
 - * fix reading of files larger than 4 GB
- **AIM**
 - * fix reading of files larger than 4 GB
- **MRC**
 - * add support for signed 8-bit data
- Fix build errors in MIPAV plugin
- **ImageJ**
 - * fix export from a script/macro
 - * fix windowless export
 - * allow exporting from any open image window
 - * allow the “Group files with similar names” and “Swap dimensions” options to be used from a script/macro
- **bfconvert**

- * fix writing each channel, Z section, and/or timepoint to a separate file
- * add options for configuring the tile size to be used when saving images

4.2.5 5.0.8 (2015 February 10)

- No changes - release to keep version numbers in sync with OMERO

4.2.6 5.0.7 (2015 February 5)

- **Several bug fixes, including:**
 - ND filter parsing for DeltaVision
 - Timepoint count and original metadata parsing for Metamorph
 - Build issues when Genshi or Git are missing
 - LZW image decoding

4.2.7 5.0.6 (2014 November 11)

- **Several bug fixes, including:**
 - Pixel sign for DICOM images
 - Image dimensions for Zeiss CZI and Nikon ND2
 - Support for Leica LIF files produced by LAS AF 4.0 and later

4.2.8 5.0.5 (2014 September 23)

- Documentation improvements
- Support for non-spectral Prairie 5.2 datasets

4.2.9 5.0.4 (2014 September 3)

- Fix compile and runtime errors under Java 1.8
- Improvements to Nikon .nd2 metadata parsing
- Added support for PicoQuant .bin files (thanks to Ian Munro)

4.2.10 5.0.3 (2014 August 7)

- Many bug fixes for Nikon .nd2 files
- **Several other bug fixes, including:**
 - LZW image decoding
 - Stage position parsing for Zeiss CZI
 - Exposure time units for ScanR
 - Physical pixel size units for DICOM
 - NDPI and Zeiss LSM files larger than 4GB
 - Z and T dimensions for InCell 6000 plates
 - Export of RGB images in ImageJ
- Improved metadata saving in MATLAB functions

4.2.11 5.0.2 (2014 May 28)

- Many bug fixes for Zeiss .czi files
- **Several other bug fixes, including:**
 - Gatan .dm3 units and step count parsing
 - Inspector .msr 5D image support
 - DICOM reading of nested tags
- Update native-lib-loader version (to 2.0.1)
- Updates and improvements to user documentation

4.2.12 5.0.1 (2014 Apr 7)

- Added image pyramid support for CellSens .vsi data
- **Several bug fixes, including:**
 - Woolz import into OMERO
 - Cellomics file name parsing (thanks to Lee Kamentsky)
 - Olympus FV1000 timestamp support (thanks to Lewis Kraft and Patrick Riley)
 - (A)PNG large image support
 - Zeiss .czi dimension detection for SPIM datasets
- Performance improvements for Becker & Hickl .sdt file reading (thanks to Ian Munro)
- Performance improvements to directory listing over NFS
- Update slf4j and logback versions (to 1.7.6 and 1.1.1 respectively)
- Update jgoodies-forms version (to 1.7.2)

4.2.13 5.0.0 (2014 Feb 25)

- New bundled 'bioformats_package.jar' for ImageJ
- Now uses logback as the slf4j binding by default
- Updated component names, .jar file names, and Maven artifact names
- Fixed support for Becker & Hickl .sdt files with multiple blocks
- Fixed tiling support for TIFF, Hamamatsu .ndpi, JPEG, and Zeiss .czi files
- Improved continuous integration testing
- Updated *command line documentation*

4.2.14 5.0.0-RC1 (2013 Dec 19)

- Updated Maven build system and launched new Artifactory repository (<http://artifacts.openmicroscopy.org>)
- **Added support for:**
 - *Bio-Rad SCN*
 - *Yokogawa CellVoyager* (thanks to Jean-Yves Tinevez)
 - *LaVision Inspector*
 - *PCORAW*
 - *Woolz* (thanks to Bill Hill)
- Added support for populating and parsing ModuloAlong{Z, C, T} annotations for FLIM/SPIM data

- Updated netCDF and slf4j version requirements - netCDF 4.3.19 and slf4j 1.7.2 are now required
- Updated and improved *MATLAB users* and *developers* documentation
- Many bug fixes including for Nikon ND2, Zeiss CZI, and CellWorX formats

4.2.15 5.0.0-beta1 (2013 June 20)

- Updated to 2013-06 OME-XML schema¹⁶
- Improved the performance in tiled formats
- Added caching of Reader metadata using <http://code.google.com/p/kryo/>
- **Added support for:**
 - *Aperio AFI*
 - *Inveon*
 - *MPI-BPC Inspector*
- **Many bug fixes, including:**
 - Add ZEN 2012/Lightsheet support to Zeiss CZI
 - Improved testing of autogenerated code
 - Moved OME-XML specification into Bio-Formats repository

4.2.16 4.4.10 (2014 Jan 15)

- Bug fixes including CellWorx, Metamorph and Zeiss CZI
- Updates to MATLAB documentation

4.2.17 4.4.9 (2013 Oct 16)

- Many bug fixes including improvements to support for ND2 format
- Java 1.6 is now the minimum supported version; Java 1.5 is no longer supported

4.2.18 4.4.8 (2013 May 2)

- No changes - release to keep version numbers in sync with OMERO

4.2.19 4.4.7 (2013 April 25)

- Many bug fixes to improve support for more than 20 formats
- Improved export to multi-file datasets
- Now uses slf4j for logging rather than using log4j directly, enabling other logging implementations to be used, for example when Bio-Formats is used as a component in other software using a different logging system.

4.2.20 4.4.6 (2013 February 11)

- Many bug fixes
- Further documentation improvements

¹⁶<http://www.openmicroscopy.org/site/support/ome-model/>

4.2.21 4.4.5 (2012 November 13)

- Restructured and improved documentation
- **Many bug fixes, including:**
 - File grouping in many multi-file formats
 - Maven build fixes
 - ITK plugin fixes

4.2.22 4.4.4 (2012 September 24)

- Many bug fixes

4.2.23 4.4.2 (2012 August 22)

- Security fix for OMERO plugins for ImageJ

4.2.24 4.4.1 (2012 July 20)

- Fix a bug that prevented BigTIFF files from being read
- Fix a bug that prevented PerkinElmer .flex files from importing into OMERO

4.2.25 4.4.0 (2012 July 13)

- Many, many bug fixes
- **Added support for:**
 - .nd2 files from Nikon Elements version 4
 - PerkinElmer Operetta data
 - MJPEG-compressed AVIs
 - MicroManager datasets with multiple positions
 - Zeiss CZI data
 - IMOD data

4.2.26 4.3.3 (2011 October 18)

- **Many bug fixes, including:**
 - Speed improvements to HCImage/SimplePCI and Zeiss ZVI files
 - Reduce memory required by Leica LIF reader
 - More accurately populate metadata for Prairie TIFF datasets
 - Various fixes to improve the security of the OMERO plugin for ImageJ
 - Better dimension detection for Bruker MRI datasets
 - Better thumbnail generation for histology (SVS, NDPI) datasets
 - Fix stage position parsing for Metamorph TIFF datasets
 - Correctly populate the channel name for PerkinElmer Flex files

4.2.27 4.3.2 (2011 September 15)

- **Many bug fixes, including:**
 - Better support for Volocity datasets that contain compressed data
 - More accurate parsing of ICS metadata
 - More accurate parsing of cellSens .vsi files
- **Added support for a few new formats**
 - .inr
 - Canon DNG
 - Hitachi S-4800
 - Kodak .bip
 - JPX
 - Volocity Library Clipping (.acff)
 - Bruker MRI
- Updated Zeiss LSM reader to parse application tags
- Various performance improvements, particularly for reading/writing TIFFs
- Updated OMERO ImageJ plugin to work with OMERO 4.3.x

4.2.28 4.3.1 (2011 July 8)

- **Several bug fixes, including:**
 - Fixes for multi-position DeltaVision files
 - Fixes for MicroManager 1.4 data
 - Fixes for 12 and 14-bit JPEG-2000 data
 - Various fixes for reading Volocity .mvd2 datasets
- Added various options to the ‘showinf’ and ‘bfconvert’ command line tools
- Added better tests for OME-XML backwards compatibility
- Added the ability to roughly stitch tiles in a multi-position dataset

4.2.29 4.3.0 (2011 June 14)

- **Many bug fixes, including:**
 - Many fixes for reading and writing sub-images
 - Fixes for stage position parsing in the Zeiss formats
 - File type detection fixes
- Updated JPEG-2000 reading and writing support to be more flexible
- **Added support for 9 new formats:**
 - InCell 3000
 - Trestle
 - Hamamatsu .ndpi
 - Hamamatsu VMS
 - SPIDER
 - Volocity .mvd2

- Olympus SIS TIFF
- IMAGIC
- cellSens VSI
- Updated to 2011-06 OME-XML schema
- Minor speed improvements in many formats
- Switched version control system from SVN to Git
- Moved all Trac tickets into the OME Trac: <http://trac.openmicroscopy.org.uk>
- Improvements to testing frameworks
- Added Maven build system as an alternative to the existing Ant build system
- Added pre-compiled C++ bindings to the download page

4.2.30 4.2.2 (2010 December 6)

- **Several bug fixes, notably:**
 - Metadata parsing fixes for Zeiss LSM, Metamorph STK, and FV1000
 - Prevented leaked file handles when exporting to TIFF/OME-TIFF
 - Fixed how BufferedImages are converted to byte arrays
- Proper support for OME-XML XML annotations
- Added support for SCANCO Medical .aim files
- Minor improvements to ImageJ plugins
- Added support for reading JPEG-compressed AVI files

4.2.31 4.2.1 (2010 November 12)

- Many, many bug fixes
- **Added support for 7 new formats:**
 - CellWorX .pnl
 - ECAT7
 - Varian FDF
 - Perkin Elmer Densitometer
 - FEI TIFF
 - Compix/SimplePCI TIFF
 - Nikon Elements TIFF
- Updated Zeiss LSM metadata parsing, with generous assistance from Zeiss, FMI, and MPI-CBG
- Lots of work to ensure that converted OME-XML validates
- Improved file stitching functionality; non-numerical file patterns and limited regular expression-style patterns are now supported

4.2.32 4.2.0 (2010 July 9)

- Fixed many, many bugs in all aspects of Bio-Formats
- Reworked ImageJ plugins to be more user- and developer-friendly
- Added many new unit tests

- Added support for approximately 25 new file formats, primarily in the SPM domain
- Rewrote underlying I/O infrastructure to be thread-safe and based on Java NIO
- Rewrote OME-XML parsing/generation layer; OME-XML 2010-06 is now supported
- Improved support for exporting large images
- Improved support for exporting to multiple files
- Updated logging infrastructure to use slf4j and log4j

4.2.33 4.1.1 (2009 December 3)

- Fixed many bugs in popular file format readers

4.1 (2009 October 21):

- Fixed many bugs in most file format readers
- Significantly improved confocal and HCS metadata parsing
- Improved C++ bindings
- Eliminated references to Java AWT classes in core Bio-Formats packages
- Added support for reading Flex datasets from multiple servers
- Improved OME-XML generation; generated OME-XML is now valid
- Added support for Olympus ScanR data
- Added OSGi information to JARs
- Added support for Amira Mesh files
- Added support for LI-FLIM files
- Added more informative exceptions
- Added support for various types of ICS lifetime data
- Added support for Nikon EZ-C1 TIFFs
- Added support for Maia Scientific MIAS data

4.2.34 4.0.1 (2009 June 1)

- Lots of bug fixes in most format readers and writers
- Added support for Analyze 7.1 files
- Added support for Nifti files
- Added support for Cellomics .c01 files
- Refactored ImageJ plugins
- Bio-Formats, the common package, and the ImageJ plugins now require Java 1.5
- Eliminated native library dependency for reading lossless JPEGs
- Changed license from GPL v3 or later to GPL v2 or later
- Updated Olympus FV1000, Zeiss LSM, Zeiss ZVI and Nikon ND2 readers to parse ROI data
- Added option to ImageJ plugin for displaying ROIs parsed from the chosen dataset
- Fixed BufferedImage construction for signed data and unsigned int data

4.2.35 4.0.0 (2009 March 3)

- Improved OME data model population for Olympus FV1000, Nikon ND2, Metamorph STK, Leica LEI, Leica LIF, InCell 1000 and MicroManager
- Added TestNG tests for format writers
- Added option to ImageJ plugin to specify custom colors when customizing channels
- Added ability to upgrade the ImageJ plugin from within ImageJ
- Fixed bugs in Nikon ND2, Leica LIF, BioRad PIC, TIFF, PSD, and OME-TIFF
- Fixed bugs in Data Browser and Exporter plugins
- Added support for Axon Raw Format (ARF), courtesy of Johannes Schindelin
- Added preliminary support for IPLab-Mac file format

4.2.36 2008 December 29

- Improved metadata support for DeltaVision, Zeiss LSM, MicroManager, and Leica LEI
- Restructured code base/build system to be component-driven
- Added support for JPEG and JPEG-2000 codecs within TIFF, OME-TIFF and OME-XML
- Added support for 16-bit compressed Flex files
- Added support for writing JPEG-2000 files
- Added support for Minolta MRW format
- Added support for the 2008-09 release of OME-XML
- Removed dependency on JMagick
- Re-added caching support to data browser plugin
- Updated loci.formats.Codec API to be more user-friendly
- Expanded loci.formats.MetadataStore API to better represent the OME-XML model
- Improved support for Nikon NEF
- Improved support for TillVision files
- Improved ImageJ import options dialog
- Fixed bugs with Zeiss LSM files larger than 4 GB
- Fixed minor bugs in most readers
- Fixed bugs with exporting from an Image5D window
- Fixed several problems with virtual stacks in ImageJ

4.2.37 2008 August 30

- Fixed bugs in many file format readers
- Fixed several bugs with swapping dimensions
- Added support for Olympus CellR/APL files
- Added support for MINC MRI files
- Added support for Aperio SVS files compressed with JPEG 2000
- Added support for writing OME-XML files
- Added support for writing APNG files
- Added faster LZW codec

- Added drag and drop support to ImageJ shortcut window
- Re-integrated caching into the data browser plugin

4.2.38 2008 July 1

- Fixed bugs in most file format readers
- Fixed bugs in OME and OMERO download functionality
- Fixed bugs in OME server-side import
- Improved metadata storage/retrieval when uploading to and downloading from the OME Perl server
- Improved Bio-Formats ImageJ macro extensions
- Major updates to MetadataStore API
- Updated OME-XML generation to use 2008-02 schema by default
- Addressed time and memory performance issues in many readers
- Changed license from LGPL to GPL
- Added support for the FEI file format
- Added support for uncompressed Hamamatsu Aquacosmos NAF files
- Added support for Animated PNG files
- Added several new options to Bio-Formats ImageJ plugin
- Added support for writing ICS files

4.2.39 2008 April 17

- Fixed bugs in Slidebook, ND2, FV1000 OIB/OIF, Perkin Elmer, TIFF, Prairie, Openlab, Zeiss LSM, MNG, Molecular Dynamics GEL, and OME-TIFF
- Fixed bugs in OME and OMERO download functionality
- Fixed bugs in OME server-side import
- Fixed bugs in Data Browser
- Added support for downloading from OMERO 2.3 servers
- Added configuration plugin
- Updates to MetadataStore API
- Updates to OME-XML generation - 2007-06 schema used by default
- Added support for Li-Cor L2D format
- Major updates to TestNG testing framework
- Added support for writing multi-series OME-TIFF files
- Added support for writing BigTIFF files

4.2.40 2008 Feb 12

- Fixed bugs in QuickTime, SimplePCI and DICOM
- Fixed a bug in channel splitting logic

4.2.41 2008 Feb 8

- Many critical bugfixes in format readers and ImageJ plugins
- **Newly reborn Data Browser for 5D image visualization**
 - some combinations of import options do not work yet

4.2.42 2008 Feb 1

- Fixed bugs in Zeiss LSM, Metamorph STK, FV1000 OIB/OIF, Leica LEI, TIFF, Zeiss ZVI, ICS, Prairie, Openlab LIFF, Gatan, DICOM, QuickTime
- Fixed bug in OME-TIFF writer
- Major changes to MetadataStore API
- Added support for JPEG-compressed TIFF files
- **Added basic support for Aperio SVS files**
 - JPEG2000 compression is still not supported
- Improved “crop on import” functionality
- Improvements to bfconvert and bfview
- Improved OME-XML population for several formats
- Added support for JPEG2000-compressed DICOM files
- EXIF data is now parsed from TIFF files

4.2.43 2007 Dec 28

- Fixed bugs in Leica LEI, Leica TCS, SDT, Leica LIF, Visitech, DICOM, Imaris 5.5 (HDF), and Slidebook readers
- Better parsing of comments in TIFF files exported from ImageJ
- Fixed problem with exporting 48-bit RGB data
- Added logic to read multi-series datasets spread across multiple files
- Improved channel merging in ImageJ - requires ImageJ 1.39l
- Support for hyperstacks and virtual stacks in ImageJ - requires ImageJ 1.39l
- Added API for reading directly from a byte array or InputStream
- Metadata key/value pairs are now stored in ImageJ’s “Info” property
- Improved OMERO download plugin - it is now much faster
- Added “open all series” option to ImageJ importer
- ND2 reader based on Nikon’s SDK now uses our own native bindings
- Fixed metadata saving bug in ImageJ
- Added sub-channel labels to ImageJ windows
- Major updates to 4D Data Browser
- Minor updates to automated testing suite

4.2.44 2007 Dec 1

- Updated OME plugin for ImageJ to support downloading from OMERO
- Fixed bug with floating point TIFFs
- Fixed bugs in Visitech, Zeiss LSM, Imaris 5.5 (HDF)
- Added alternate ND2 reader that uses Nikon's native libraries
- Fixed calibration and series name settings in importer
- Added basic support for InCell 1000 datasets

4.2.45 2007 Nov 21

- Fixed bugs in ND2, Leica LIF, DICOM, Zeiss ZVI, Zeiss LSM, FV1000 OIB, FV1000 OIF, BMP, Evotec Flex, BioRad PIC, Slidebook, TIFF
- Added new ImageJ plugins to slice stacks and do "smart" RGB merging
- **Added "windowless" importer plugin**
 - uses import parameters from IJ_Prefs.txt, without prompting the user
- Improved stack slicing and colorizing logic in importer plugin
- **Added support for DICOM files compressed with lossless JPEG**
 - requires native libraries
- Fixed bugs with signed pixel data
- Added support for Imaris 5.5 (HDF) files
- Added 4 channel merging to importer plugin
- Added API methods for reading subimages
- Major updates to the 4D Data Browser

4.2.46 2007 Oct 17

- Critical OME-TIFF bugfixes
- Fixed bugs in Leica LIF, Zeiss ZVI, TIFF, DICOM, and AVI readers
- Added support for JPEG-compressed ZVI images
- Added support for BigTIFF
- Added importer plugin option to open each plane in a new window
- Added MS Video 1 codec for AVI

4.2.47 2007 Oct 1

- Added support for compressed DICOM images
- Added support for uncompressed LIM files
- Added support for Adobe Photoshop PSD files
- Fixed bugs in DICOM, OME-TIFF, Leica LIF, Zeiss ZVI, Visitech, PerkinElmer and Metamorph
- Improved indexed color support
- Addressed several efficiency issues
- Fixed how multiple series are handled in 4D data browser
- Added option to reorder stacks in importer plugin

- Added option to turn off autoscaling in importer plugin
- Additional metadata convenience methods

4.2.48 2007 Sept 11

- Major improvements to ND2 support; lossless compression now supported
- Support for indexed color images
- Added support for Simple-PCI .cxd files
- Command-line OME-XML validation
- Bugfixes in most readers, especially Zeiss ZVI, Metamorph, PerkinElmer and Leica LEI
- Initial version of Bio-Formats macro extensions for ImageJ

4.2.49 2007 Aug 1

- Added support for latest version of Leica LIF
- Fixed several issues with Leica LIF, Zeiss ZVI
- Better metadata mapping for Zeiss ZVI
- Added OME-TIFF writer
- Added MetadataRetrieve API for retrieving data from a MetadataStore
- Miscellaneous bugfixes

4.2.50 2007 July 16

- Fixed several issues with ImageJ plugins
- Better support for Improvion and Leica TCS TIFF files
- Minor improvements to Leica LIF, ICS, QuickTime and Zeiss ZVI readers
- Added searchable metadata window to ImageJ importer

4.2.51 2007 July 2

- Fixed issues with ND2, Openlab LIFF and Slidebook
- Added support for Visitech XYS
- Added composite stack support to ImageJ importer

4.2.52 2007 June 18

- Fixed issues with ICS, ND2, MicroManager, Leica LEI, and FV1000 OIF
- Added support for large (> 2 GB) ND2 files
- Added support for new version of ND2
- Minor enhancements to ImageJ importer
- Implemented more flexible logging
- Updated automated testing framework to use TestNG
- Added package for caching images produced by Bio-Formats

4.2.53 2007 June 6

- Fixed OME upload/download bugs
- Fixed issues with ND2, EPS, Leica LIF, and OIF
- Added support for Khoros XV
- Minor improvements to the importer

4.2.54 2007 May 24

- Better Slidebook support
- Added support for Quicktime RPZA
- Better Leica LIF metadata parsing
- Added support for BioRad PIC companion files
- Added support for bzip2-compressed files
- Improved ImageJ plugins
- Native support for FITS and PGM

4.2.55 2007 May 2

- Added support for NRRD
- Added support for Evotec Flex (requires LuraWave Java SDK with license code)
- Added support for gzip-compressed files
- Added support for compressed QuickTime headers
- Fixed QuickTime Motion JPEG-B support
- Fixed some memory issues (repeated small array allocations)
- Fixed issues reading large (> 2 GB) files
- Removed “ignore color table” logic, and replaced with Leica-specific solution
- Added status event reporting to readers
- Added API to toggle metadata collection
- Support for multiple dimensions rasterized into channels
- Deprecated reader and writer methods that accept the ‘id’ parameter
- Deprecated IFormatWriter.save in favor of saveImage and saveBytes
- Moved dimension swapping and min/max calculation logic to delegates
- Separate GUI logic into isolated loci.formats.gui package
- Miscellaneous bugfixes and tweaks in most readers and writers
- Many other bugfixes and improvements

4.2.56 2007 Mar 16

- Fixed calibration bugs in importer plugin
- Enhanced metadata support for additional formats
- Fixed LSM bug

4.2.57 2007 Mar 7

- Added support for Micro-Manager file format
- Fixed several bugs – Leica LIF, Leica LEI, ICS, ND2, and others
- Enhanced metadata support for several formats
- Load series preview thumbnails in the background
- Better implementation of `openBytes(String, int, byte[])` for most readers
- Expanded unit testing framework

4.2.58 2007 Feb 28

- Better series preview thumbnails
- Fixed bugs with multi-channel Leica LEI
- Fixed bugs with “ignore color tables” option in ImageJ plugin

4.2.59 2007 Feb 26

- Many bugfixes: Leica LEI, ICS, FV1000 OIB, OME-XML and others
- Better metadata parsing for BioRad PIC files
- Enhanced API for calculating channel minimum and maximum values
- Expanded `MetadataStore` API to include more semantic types
- Added thumbnails to series chooser in ImageJ plugin
- Fixed plugins that upload and download from an OME server

4.2.60 2007 Feb 7

- Added plugin for downloading images from OME server
- Improved HTTP import functionality
- Added metadata filtering – unreadable metadata is no longer shown
- Better metadata table for multi-series datasets
- Added support for calibration information in Gatan DM3
- Eliminated need to install JAI Image I/O Tools to read ND2 files
- Fixed ZVI bugs: metadata truncation, and other problems
- Fixed bugs in Leica LIF: incorrect calibration, first series labeling
- Fixed memory bug in Zeiss LSM
- Many bugfixes: PerkinElmer, DeltaVision, Leica LEI, LSM, ND2, and others
- `IFormatReader.close(boolean)` method to close files temporarily
- Replaced Compression utility class with extensible Compressor interface
- Improved testing framework to use `.bioformats` configuration files

4.2.61 2007 Jan 5

- Added support for Prairie TIFF
- Fixed bugs in Zeiss LSM, OIB, OIF, and ND2
- Improved API for writing files
- Added feature to read files over HTTP
- Fixed bugs in automated testing framework
- Miscellaneous bugfixes

4.2.62 2006 Dec 22

- Expanded ImageJ plugin to optionally use Image5D or View5D
- Improved support for ND2 and JPEG-2000 files
- Added automated testing framework
- Fixed bugs in Zeiss ZVI reader
- Miscellaneous bugfixes

4.2.63 2006 Nov 30

- Added support for ND2/JPEG-2000
- Added support for MRC
- Added support for MNG
- Improved support for floating-point images
- Fixed problem with 2-channel Leica LIF data
- Minor tweaks and bugfixes in many readers
- Improved file stitching logic
- Allow ImageJ plugin to be called from a macro

4.2.64 2006 Nov 2

- Bugfixes and improvements for Leica LIF, Zeiss LSM, OIF and OIB
- Colorize channels when they are split into separate windows
- Fixed a bug with 4-channel datasets

4.2.65 2006 Oct 31

- Added support for Imaris 5 files
- Added support for RGB ICS images

4.2.66 2006 Oct 30

- Added support for tiled TIFFs
- Fixed bugs in ICS reader
- Fixed importer plugin deadlock on some systems

4.2.67 2006 Oct 27

- Multi-series support for Slidebook
- Added support for Alicona AL3D
- Fixed plane ordering issue with FV1000 OIB
- Enhanced dimension detection in FV1000 OIF
- Added preliminary support for reading NEF images
- Added option to ignore color tables
- Fixed ImageJ GUI problems
- Fixed spatial calibration problem in ImageJ
- Fixed some lingering bugs in Zeiss ZVI support
- Fixed bugs in OME-XML reader
- Tweaked ICS floating-point logic
- Fixed memory leaks in all readers
- Better file stitching logic

4.2.68 2006 Oct 6

- Support for 3i SlideBook format (single series only for now)
- Support for 16-bit RGB palette TIFF
- Fixed bug preventing import of certain Metamorph STK files
- Fixed some bugs in PerkinElmer UltraView support
- Fixed some bugs in Leica LEI support
- Fixed a bug in Zeiss ZVI support
- Fixed bugs in Zeiss LSM support
- Fixed a bug causing slow identification of Leica datasets
- Fixed bugs in the channel merging logic
- Fixed memory leak for OIB format
- Better scaling of 48-bit RGB data to 24-bit RGB
- Fixed duplicate channels bug in “open each channel in a separate window”
- Fixed a bug preventing PICT import into ImageJ
- Better integration with HandleExtraFileTypes
- Better virtual stack support in Data Browser plugin
- Fixed bug in native QuickTime random access
- Keep aspect ratio for computed thumbnails
- Much faster file stitching logic

4.2.69 2006 Sep 27

- PerkinElmer: support for PE UltraView
- Openlab LIFF: support for Openlab v5
- Leica LEI: bugfixes, and support for multiple series
- ZVI, OIB, IPW: more robust handling of these formats (eliminated custom OLE parsing logic in favor of Apache POI)

- OIB: better metadata parsing (but maybe still not perfect?)
- LSM: fixed a bug preventing import of certain LSMs
- Metamorph STK: fixed a bug resulting in duplicate image planes
- User interface: use of system look & feel for file chooser dialog when available
- Better notification when JAR libraries are missing

4.2.70 2006 Sep 6

- Leica LIF: multiple distinct image series within a single file
- Zeiss ZVI: fixes and improvements contributed by Michel Boudinot
- Zeiss LSM: fixed bugs preventing the import of certain LSM files
- TIFF: fixed a bug preventing import of TIFFs created with Bio-Rad software

4.2.71 2006 Mar 31

- First release

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁷](#) or the [previous versions¹⁸](#) page to find documentation for the version you are using.

¹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁸<http://www.openmicroscopy.org/site/support/legacy/>

Part II

User Information

USING BIO-FORMATS WITH IMAGEJ AND FIJI

The following sections explain the features of Bio-Formats and how to use it within ImageJ and Fiji:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](#) or the [previous versions²](#) page to find documentation for the version you are using.

5.1 ImageJ overview

ImageJ³ is an image processing and analysis application written in Java, widely used in the life sciences fields, with an extensible plugin infrastructure. You can use Bio-Formats as a plugin for ImageJ to read and write images in the formats it supports.

5.1.1 Installation

Download [bioformats_package.jar⁴](#) and drop it into your **ImageJ/plugins** folder. Next time you run ImageJ, a new Bio-Formats submenu with several plugins will appear in the Plugins menu, including the Bio-Formats Importer and Bio-Formats Exporter.

5.1.2 Usage

The Bio-Formats Importer plugin can display image stacks in several ways:

- In a standard ImageJ window (including as a hyperstack)
- Using the [LOCI Data Browser⁵](#) plugin (included)
- With Joachim Walter's [Image5D⁶](#) plugin (if installed)
- With Rainer Heintzmann's [View5D⁷](#) plugin (if installed)

ImageJ v1.37 and later automatically (via `HandleExtraFileTypes`) calls the Bio-Formats logic, if installed, as needed when a file is opened within ImageJ, i.e. when using *File* → *Open* instead of explicitly choosing *Plugins* → *Bio-Formats* → *Bio-Formats Importer* from the menu.

For a more detailed description of each plugin, see the [Bio-Formats page⁸](#) of the Fiji wiki.

5.1.3 Upgrading

To upgrade, just overwrite the old **bioformats_package.jar** with the [latest one⁹](#).

You may want to download the latest version of ImageJ first, to take advantage of new features and bug-fixes.

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

³<http://rsb.info.nih.gov/ij/>

⁴http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/bioformats_package.jar

⁵<http://loci.wisc.edu/software/data-browser>

⁶<http://developer.imagej.net/plugins/image5d>

⁷<http://www.nanoimaging.de/View5D>

⁸<http://fiji.sc/Bio-Formats>

⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

As of the 4.0.0 release, you can also upgrade the Bio-Formats plugin directly from ImageJ. Select *Plugins* → *Bio-Formats* → *Update Bio-Formats Plugins* from the ImageJ menu, then select which release you would like to use. You will then need to restart ImageJ to complete the upgrade process.

5.1.4 Macros and plugins

Bio-Formats is fully scriptable in a macro, and callable from a plugin. To use in a macro, use the Macro Recorder to record a call to the Bio-Formats Importer with the desired options. You can also perform more targeted metadata queries using the Bio-Formats macro extensions.

Here are some example ImageJ macros and plugins that use Bio-Formats to get you started:

[basicMetadata.txt](#)¹⁰ - A macro that uses the Bio-Formats macro extensions to print the chosen file's basic dimensional parameters to the Log.

[planeTimings.txt](#)¹¹ - A macro that uses the Bio-Formats macro extensions to print the chosen file's plane timings to the Log.

[recursiveTiffConvert.txt](#)¹² - A macro for recursively converting files to TIFF using Bio-Formats.

[bfOpenAsHyperstack.txt](#)¹³ - This macro from Wayne Rasband opens a file as a hyperstack using only the Bio-Formats macro extensions (without calling the Bio-Formats Importer plugin).

[zvi2HyperStack.txt](#)¹⁴ - This macro from Sebastien Huart reads in a ZVI file using Bio-Formats, synthesizes the LUT using emission wavelength metadata, and displays the result as a hyperstack.

[dvSplitTimePoints.txt](#)¹⁵ - This macro from Sebastien Huart splits timepoints/channels on all DV files in a folder.

[batchTiffConvert.txt](#)¹⁶ - This macro converts all files in a directory to TIFF using the Bio-Formats macro extensions.

[Read_Image](#)¹⁷ - A simple plugin that demonstrates how to use Bio-Formats to read files into ImageJ.

[Mass_Importer](#)¹⁸ - A simple plugin that demonstrates how to open all image files in a directory using Bio-Formats, grouping files with similar names to avoiding opening the same dataset more than once.

5.1.5 Usage tips

- “How do I make the options window go away?” is a common question. There are a few ways to do this:
 - To disable the options window only for files in a specific format, select *Plugins* > *Bio-Formats* > *Bio-Formats Plugins Configuration*, then pick the format from the list and make sure the “Windowless” option is checked.
 - To avoid the options window entirely, use the *Plugins* > *Bio-Formats* > *Bio-Formats Windowless Importer* menu item to import files.
 - Open files by calling the Bio-Formats importer plugin from a macro.
- A common cause of problems having multiple copies of `bioformats_package.jar` in you ImageJ plugins folder, or a copy of `bioformats_package.jar` and a copy of `formats-gpl.jar`. It is often difficult to determine for sure that this is the problem - the only error message that pretty much guarantees it is a `NoSuchMethodException`. If you downloaded the latest version and whatever error message or odd behavior you are seeing has been reported as fixed, it is worth removing all copies of `bioformats_package.jar` (and `loci_tools.jar` or any other Bio-Formats jars) and download a fresh version.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁹ or the [previous versions](#)²⁰ page to find documentation for the version you are using.

¹⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utils/macros/basicMetadata.txt>

¹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utils/macros/planeTimings.txt>

¹²<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utils/macros/recursiveTiffConvert.txt>

¹³<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utils/macros/bfOpenAsHyperstack.txt>

¹⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utils/macros/zvi2HyperStack.txt>

¹⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utils/macros/dvSplitTimePoints.txt>

¹⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utils/macros/batchTiffConvert.txt>

¹⁷https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utils/Read_Image.java

¹⁸https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utils/Mass_Importer.java

¹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁰<http://www.openmicroscopy.org/site/support/legacy/>

5.2 Fiji overview

Fiji²¹ is an image processing package. It can be described as a distribution of *ImageJ* together with Java, Java 3D and a lot of plugins organized into a *coherent menu structure*²². Fiji compares to ImageJ as Ubuntu compares to Linux.

Fiji works with Bio-Formats out of the box, because it comes bundled with the *Bio-Formats ImageJ plugins*.

For further details on Bio-Formats in Fiji, see the [Bio-Formats Fiji wiki page](#)²³.

5.2.1 Upgrading

Upgrading Bio-Formats within Fiji is as simple as invoking the “Update Fiji” command from the Help menu. By default, Fiji even automatically checks for updates every time it is launched, so you will always be notified when new versions of Bio-Formats (or any other bundled plugin) are available.

Using Bio-Formats daily builds

Fiji currently shipping with the 5.1.x release versions of Bio-Formats. However, if you have encountered a bug which has been fixed by the Bio-Formats team but not yet released, you can use the Bio-Formats update site to access the daily build as described in the [Fiji documentation](#)²⁴.

Warning: These builds are **not yet released** and should be considered **beta** in quality. In particular, you should **avoid exporting data using the Bio-Formats Exporter** in case you write incompatible files which cannot be read by released versions of Bio-Formats or other OME-compliant tools.
We recommend waiting for a fully tested release version of Bio-Formats if possible.

Manual upgrade

Manually updating your Fiji installation should not be necessary but if you need to do so, the steps are detailed below. Note that although we assume you will be upgrading to the latest release version, all previous versions of Bio-Formats are available from <http://downloads.openmicroscopy.org/bio-formats/> so you can revert to an earlier version using this guide if you need to.

1. Fiji must first be fully updated
2. Close Fiji
3. Open the Fiji installation folder (typically named ‘Fiji.app’)
4. Remove `bio-formats_plugins.jar` from the ‘plugins’ sub-folder
5. Remove all of the .jars from the ‘jars/bio-formats’ sub-folder:
 - `jai_imageio.jar`
 - `formats-gpl.jar`
 - `formats-common.jar`
 - `turbojpeg.jar`
 - `ome-xml.jar`
 - `formats-bsd.jar`
 - `ome-poi.jar`
 - `specification.jar`
 - `mdbtools-java.jar`
 - `metakit.jar`

²¹<http://fiji.sc/>

²²http://fiji.sc/Plugins_Menu

²³<http://fiji.sc/Bio-Formats>

²⁴http://fiji.sc/Bio-Formats#Daily_builds

- formats-api.jar
6. Download bio-formats_plugins.jar (from the latest release <http://downloads.openmicroscopy.org/bio-formats/>) and place it in the 'plugins' sub-folder
 7. Download each of the following (from the latest release <http://downloads.openmicroscopy.org/bio-formats/>) and place them in the 'jars/bio-formats' sub-folder:
 - jai_imageio.jar
 - formats-gpl.jar
 - formats-common.jar
 - turbojpeg.jar
 - ome-xml.jar
 - formats-bsd.jar
 - ome-poi.jar
 - specification.jar
 - mdbtools-java.jar
 - metakit.jar
 - formats-api.jar
 8. To Check Version of Bio-Formats *Select Help > About Plugins > Bio-Formats Plugins...* Check that the version of Bio-Formats matches the freshly downloaded version.
 9. Start Fiji and open any Image file using *Plugins > Bio-Formats > Bio-Formats Importer*

Note: It is vital to perform all of those steps in order; omitting even one will cause a problem. In particular, make sure that the old files are fully removed; it is not sufficient to add the new files to any sub-directory without removing the old files first.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁵](#) or the [previous versions²⁶](#) page to find documentation for the version you are using.

5.3 Bio-Formats features in ImageJ and Fiji

When you select Bio-Formats under the Plugin menu, you will see the following features:

- The **Bio-Formats Importer** is a plugin for *loading images* into ImageJ or Fiji. It can read over 140 proprietary life sciences formats and standardizes their acquisition metadata into the common *OME data model*. It will also extract and set basic metadata values such as *spatial calibration²⁷* if they are available in the file.
- The **Bio-Formats Exporter** is a plugin for exporting data to disk. It can save to the open *OME-TIFF²⁸* file format, as well as several movie formats (e.g. QuickTime, AVI) and graphics formats (e.g. PNG, JPEG).
- The **Bio-Formats Remote Importer** is a plugin for importing data from a remote URL. It is likely to be less robust than working with files on disk, so we recommend downloading your data to disk and using the regular Bio-Formats Importer whenever possible.
- The **Bio-Formats Windowless Importer** is a version of the Bio-Formats Importer plugin that runs with the last used settings to avoid any additional dialogs beyond the file chooser. If you always use the same import settings, you may wish to use the windowless importer to save time (Learn more [here](#)).
- The **Bio-Formats Macro Extensions** plugin prints out the set of commands that can be used to create macro extensions. The commands and the instructions for using them are printed to the ImageJ log window.

²⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁶<http://www.openmicroscopy.org/site/support/legacy/>

²⁷<http://fiji.sc/SpatialCalibration>

²⁸<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff>

- The **Stack Slicer** plugin is a helper plugin used by the Bio-Formats Importer. It can also be used to split a stack across channels, focal planes or time points.
- The **Bio-Formats Plugins Configuration** dialog is a useful way to configure the behavior of each file format. The Formats tab lists supported file formats and toggles each format on or off, which is useful if your file is detected as the wrong format. It also toggles whether each format bypasses the importer options dialog through the “Windowless” checkbox. You can also configure any specific option for each format. The Libraries tab provides a list of available helper libraries used by Bio-Formats.
- The **Bio-Formats Plugins Shortcut Window** opens a small window with a quick-launch button for each plugin. Dragging and dropping files onto the shortcut window opens them quickly using the **Bio-Formats Importer** plugin.
- The **Update Bio-Formats Plugins** command will check for updates to the plugins. We recommend you update to the newest Trunk build as soon as you think you may have *discovered a bug*.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁹ or the [previous versions](#)³⁰ page to find documentation for the version you are using.

5.4 Installing Bio-Formats in ImageJ

Note: Since FIJI is essentially ImageJ with plugins like Bio-Formats already built in, people who install Fiji can skip this section. If you are also using the OMERO plugin for ImageJ, you may find the set-up guide on the new [user help site](#)³¹ useful for getting you started with both plugins at the same time.

Once you [download](#)³² and install ImageJ, you can install the Bio-Formats plugin by going to the Bio-Formats [download page](#)³³.

For most end-users, we recommend downloading the **bioformats_package.jar** complete bundle.

However, you must decide which version of it you want to install. There are three primary versions of Bio-Formats: the latest builds, the daily builds, and the release versions. Which version you should download depends on your needs:

- The **latest build** is automatically updated every time any change is made to the source code on the main “dev_5_0” branch in Git, Bio-Formats’ software version control system. This build has the latest bug fixes, but it is not well tested and may have also introduced new bugs.
- The **daily build** is a compilation of that day’s changes that occurs daily around midnight. It is not any better tested than the latest build; but if you download it multiple times in a day, you can be sure you will get the same version each time.
- The **release** is thoroughly tested and has documentation to match. The list of supported formats on the Bio-Formats site corresponds to the most recent release. We do not add new formats to the list until a release containing support for that format has been completed. The release is less likely to contain bugs.

The release version is also more useful to programmers because they can link their software to a known, fixed version of Bio-Formats. Bio-Formats’ behavior will not be changing “out from under them” as they continue developing their own programs.

Note: There are currently **two** release version of Bio-Formats as we are maintaining support for the 4.4.x series while only actively developing the new 5.x series. Unless you are using Bio-Formats with the OMERO ImageJ plugin and an OMERO 4.4.x server, we recommend you use Bio-Formats 5. A new 4.4.x version will only be released if a major bug fix is required.

We often **recommend that most people simply use the latest build** for two reasons. First, it may contain bug-fixes or new features you want anyway; secondly, you will have to reproduce any bug you encounter in Bio-Formats against the latest build before submitting a bug report. Rather than using the release until you find a bug that requires you to upgrade and reproduce it, why not just use the latest build to begin with?

Once you decide which version you need, go to the Bio-Formats [download page](#)³⁴ and save the appropriate **bioformats_package.jar** to the Plugins directory within ImageJ.

²⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰<http://www.openmicroscopy.org/site/support/legacy/>

³¹<http://help.openmicroscopy.org/imagej.html>

³²<http://rsbweb.nih.gov/ij/download.html>

³³<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

³⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

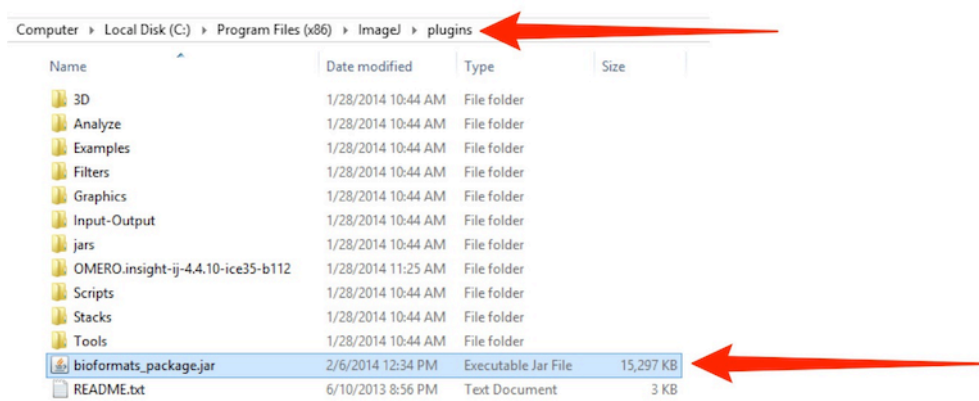
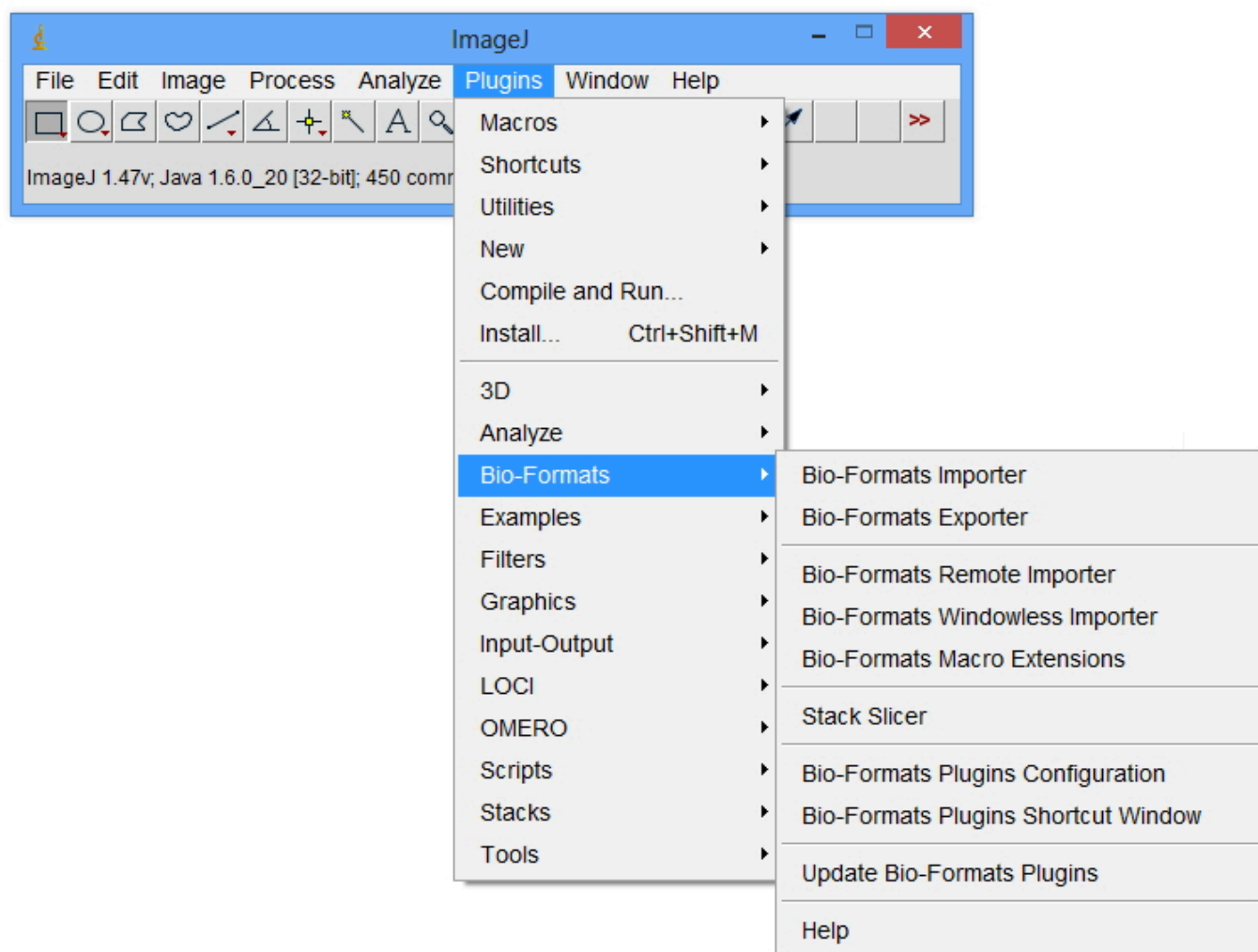


Figure 5.1: Plugin Directory for ImageJ: Where in ImageJ's file structure you should place the file once you downloaded it.

You may have to quit and restart ImageJ. Once you restart it, you will find Bio-Formats in the Bio-Formats option under the Plugins menu:



You are now ready to start using Bio-Formats.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](http://www.openmicroscopy.org/site/support/bio-formats5.0/)³⁵ or the [previous versions](http://www.openmicroscopy.org/site/support/legacy/)³⁶ page to find documentation for the version you are using.

³⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁶<http://www.openmicroscopy.org/site/support/legacy/>

5.5 Using Bio-Formats to load images into ImageJ

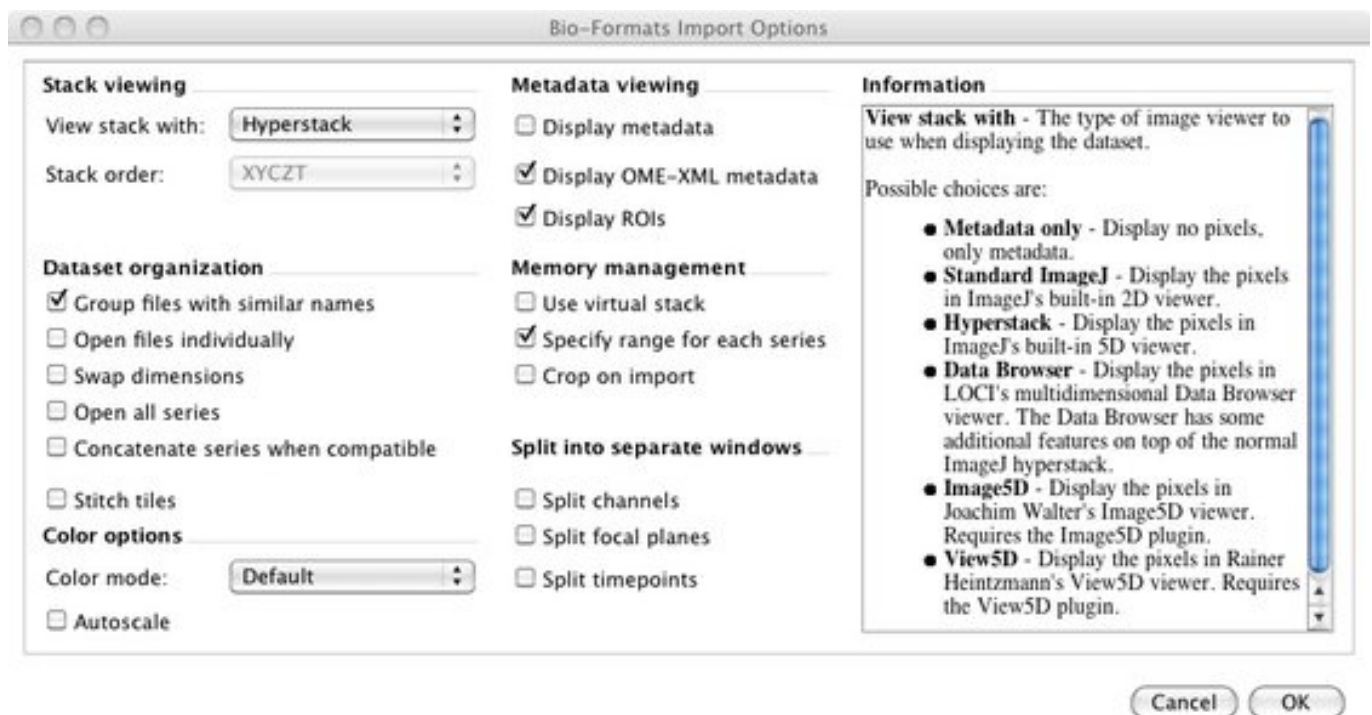
This section will explain how to use Bio-Formats to import files into ImageJ and how to use the settings on the Bio-Formats Import Options screen.

5.5.1 Opening files

There are three ways you can open a file using Bio-Formats:

1. Select the Bio-Formats Importer under the Bio-Formats plugins menu.
2. Drag and drop it onto the Bio-Formats Plugins Shortcut window.
3. Use the Open command in the File menu.

Unless you used the Bio-Formats Plugins Configuration dialog to open the file type windowlessly, you know you used Bio-Formats to open a file when you see a screen like this:



If you used the File > Open command and did not see the Bio-Formats Import Options screen, ImageJ/Fiji probably used another plugin instead of Bio-Formats to open the file. If this happens and you want to open a file using Bio-Formats, use one of the other two methods instead.

5.5.2 Opening files windowlessly

When you open a file with Bio-Formats, the Import Options Screen automatically recalls the settings you last used to open a file with that specific format (e.g. JPG, TIF, LSM, etc.). If you always choose the same options whenever you open files in a specific file format, you can save yourself time by bypassing the Bio-Formats Import Options screen. You can accomplish this two ways:

1. You can select the **Bio-Formats Windowless Importer**, located in the Bio-Formats menu under ImageJ's Plugin menu. When you select this option, Bio-Formats will import the file using the same settings you used the last time you imported a file with the same format.
2. If you invariably use the same settings when you open files in a specific format, you can always bypass the Import Options Screen by changing the settings in the **Bio-Formats Plugins Configuration** option, which is also located in the Bio-Formats menu under ImageJ's Plugin menu.

Once you select this option, select the file format you are interested in from the list on the left side of the screen. Check both the **Enabled** and **Windowless** boxes. Once you do this, whenever you open a file using the **Bio-Formats Windowless Importer**, the

Bio-Formats Importer, or the drag-and-drop method described in the previous section, the file will always open the same way using the last setting used.

Please note that if you want to change any of the import settings once you enable this windowless option, you will have to go back to the **Bio-Formats Plugins Configuration** screen, unselect the windowless option, open a file using the regular **Bio-Formats Importer**, select your settings, and re-select the windowless option.

5.5.3 Group files with similar names

One of the most important features of Bio-Formats is to combine multiple files from a data set into one coherent, multi-dimensional image.

To demonstrate how to use the **Group files with similar names** feature, you can use the [dub³⁷](http://loci.wisc.edu/sample-data/dub) data set available under LOCI's [Sample Data³⁸](http://loci.wisc.edu/sample-data) page. You will notice that it is a large dataset: each of the 85 files shows the specimen at 33 optical sections along the z-plane at a specific time.

If you open just one file in ImageJ/Fiji using the **Bio-Formats Importer**, you will get an image incorporating three dimensions (x, y, z). However, if you select **Group files with similar names** from the Bio-Formats Import Options screen, you will be able to create a 4-D image (x, y, z, and t) incorporating the 85 files.

After clicking OK, you will see a screen like this:

This screen allows you to select which files within the 85-file cluster to use to create that 4-D image. Some information will be pre-populated in the fields. Unless you want to change the settings in that field, there is no need to change or delete it. If you click OK at this point, you will load all 85 files.

However, you can specify which files you want to open by adjusting the “axis information”, the file “name contains”, or the “pattern” sections. Even though there are three options, you only need to make changes to one of them. Since Bio-Format’s precedence for processing data is from top to bottom, only the uppermost section that you made changes to will be used. If you change multiple boxes, any information you enter into lower boxes will be ignored.

To return to the example involving the dub data set, suppose you want to open the first image and only every fifth image afterwards (i.e. dub01, dub06, dub11 . . . dub81). This would give you 17 images. There are different ways to accomplish this:

You can use the **Axis Settings** only when your files are numbered in sequential order and you want to open only a subset of the files that have similar names. Since the dub data set is numbered sequentially, you can use this feature.

Axis 1 number of images refers to the total number of images you want to open. Since you want to view 17 images, enter 17. **Axis 1 axis first image** specifies which image in the set you want to be the first. Since you want to start with dub01, enter 1 in that box. You also want to view only every fifth image, so enter 5 in the **Axis 1 axis increment** box.

³⁷<http://loci.wisc.edu/sample-data/dub>

³⁸<http://loci.wisc.edu/software/sample-data>

The **File name contains** box should be used if all of the files that you want to open have common text. This is especially useful when the files are not numbered. For example, if you have “Image_Red.tif”, “Image_Green.tif”, and “Image_Blue.tif” you could enter “Image_” in the box to group them all.

To continue the example involving the dub data set, you cannot use the **file name contains** box to open every fifth image. However, if you only wanted to open dub10 through dub19, you could enter “dub1” in the **file name contains** box.

The **pattern** box can be used to do either of the options listed above or much more. This box can accept a single file name like “dub01.pic”. It can also contain a pattern that use “<” and “>” to specify what numbers or text the file names contain.

There are three basic forms to the “< >” blocks:

- Text enumeration - “Image_<Red,Green,Blue>.tif” is the pattern for Image_Red.tif, Image_Green.tif, Image_Blue.tif. (Note that the order you in which you enter the file names is the order in which they will be loaded.)
- Number range - “dub<1-85>.pic” is the pattern for “dub1.pic”, “dub2.pic”, “dub3.pic” . . . “dub85.pic”.
- Number range with step - “dub<1-85:5>.pic” is the pattern for “dub1.pic”, “dub6.pic”, “dub11.pic”, “dub11.pic” . . . “dub85.pic”.

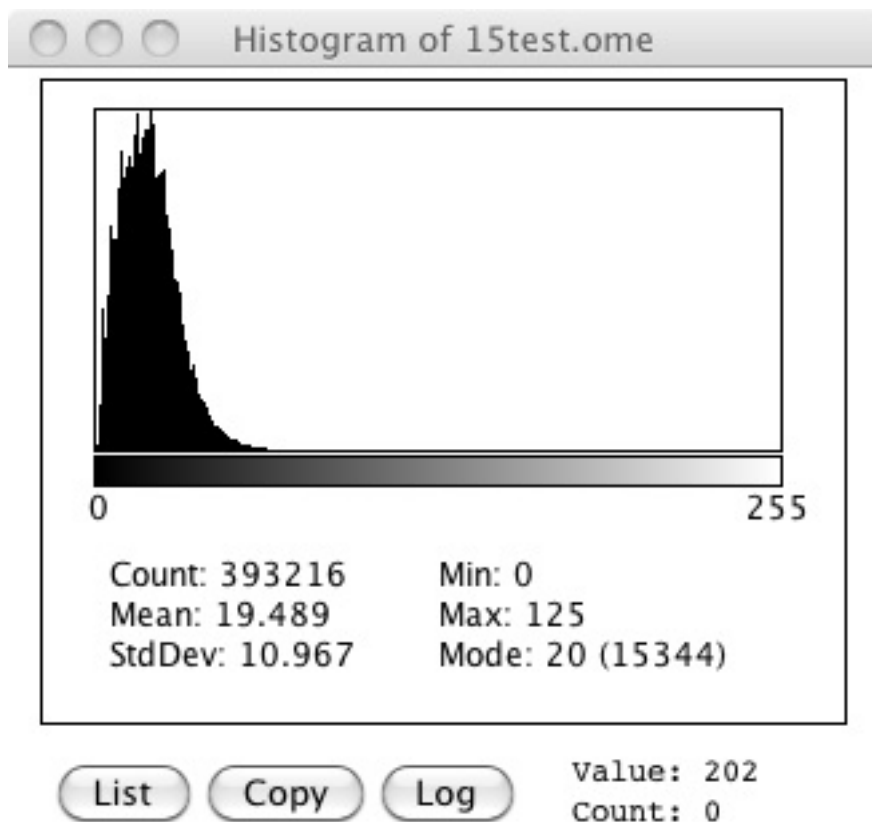
It can also accept a [Java regular expression](#)³⁹.

5.5.4 Autoscale

Autoscale helps increase the brightness and contrast of an image by adjusting the range of light intensity within an image to match the range of possible display values. Note that Autoscale does not change your data. It just changes how it is displayed.

Each pixel in an image has a numerical value ascribed to it to describe its intensity. The bit depth—the number of possible values—depends on the number of bits used in the image. Eight bits, for example, gives 256 values to express intensity where 0 is completely black, 255 is completely white, and 1 through 254 display increasingly lighter shades of grey.

ImageJ can collect the intensity information about each pixel from an image or stack and create a histogram (you can see it by selecting Histogram under the Analyze menu). Here is the histogram of a one particular image:

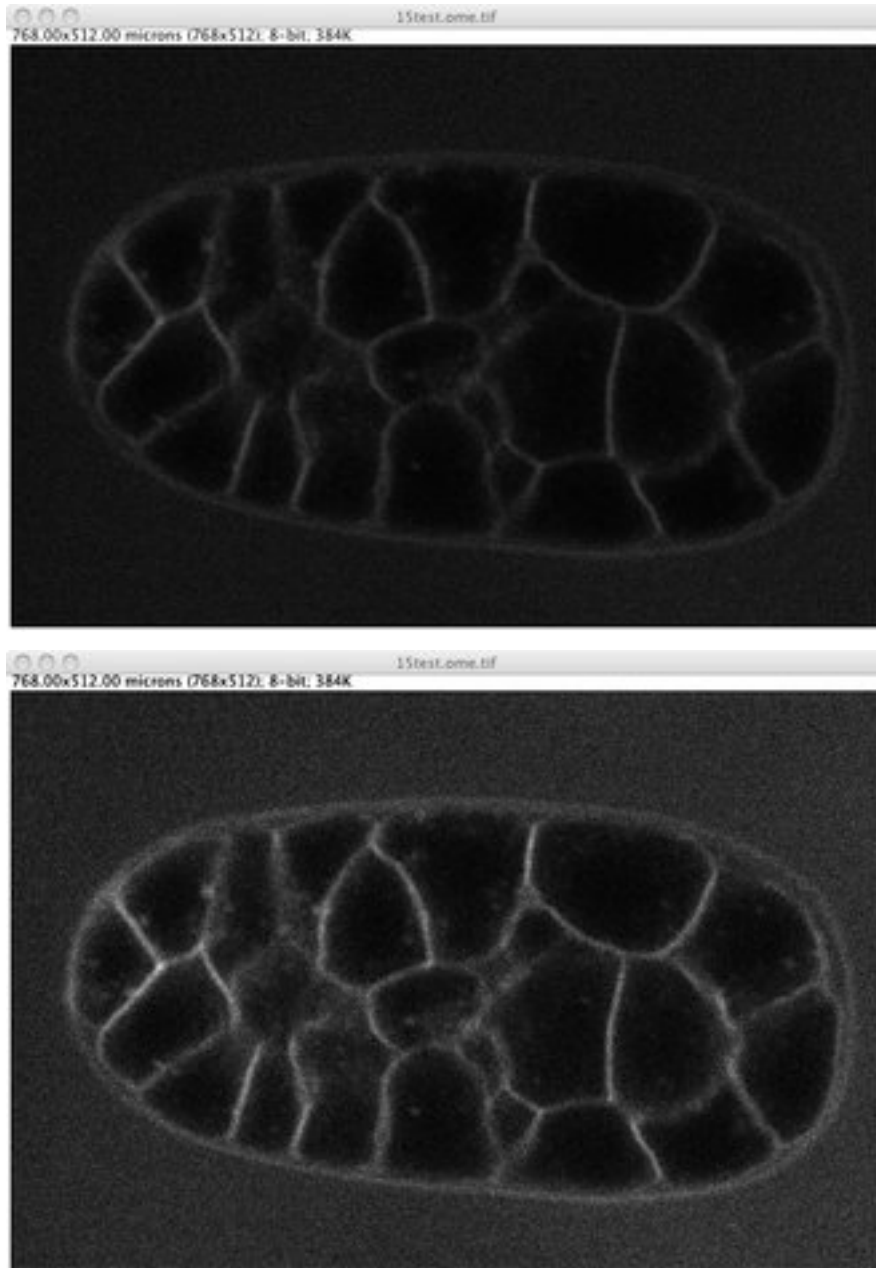


Notice that the histogram heavily skews right. Even though there are 256 possible values, only 0 through 125 are being used.

³⁹<http://download.oracle.com/javase/1.5.0/docs/api/java/util/regex/Pattern.html>

Autoscale adjusts the image so the smallest and largest number in that image or stack's histogram become the darkest and brightest settings. For this image, pixels with the intensity of 125 will be displayed in pure white. The other values will be adjusted too to help show contrast between values that were too insignificant to see before.

Here is one image Bio-Formats imported with and without using Autoscale:



Autoscale readjusts the image based on the highest value in the entire data set. This means if the highest value in your dataset is close to maximum display value, Autoscale's adjusting may be undetectable to the eye.

ImageJ/Fiji also has its own tools for adjusting the image, which are available by selecting Brightness/Contrast, which is under the Adjust option in the Image menu.

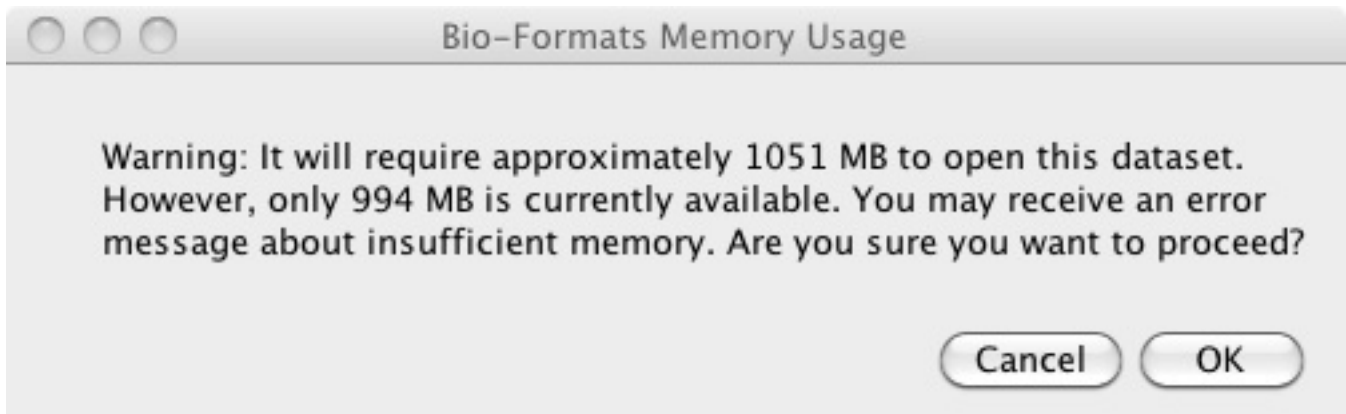
Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴⁰](#) or the [previous versions⁴¹](#) page to find documentation for the version you are using.

⁴⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴¹<http://www.openmicroscopy.org/site/support/legacy/>

5.6 Managing memory in ImageJ/Fiji using Bio-Formats

When dealing with a large stack of images, you may receive a warning like this:



This means the allotted memory is less than what Bio-Formats needs to load all the images. If you have a very large data set, you may have to:

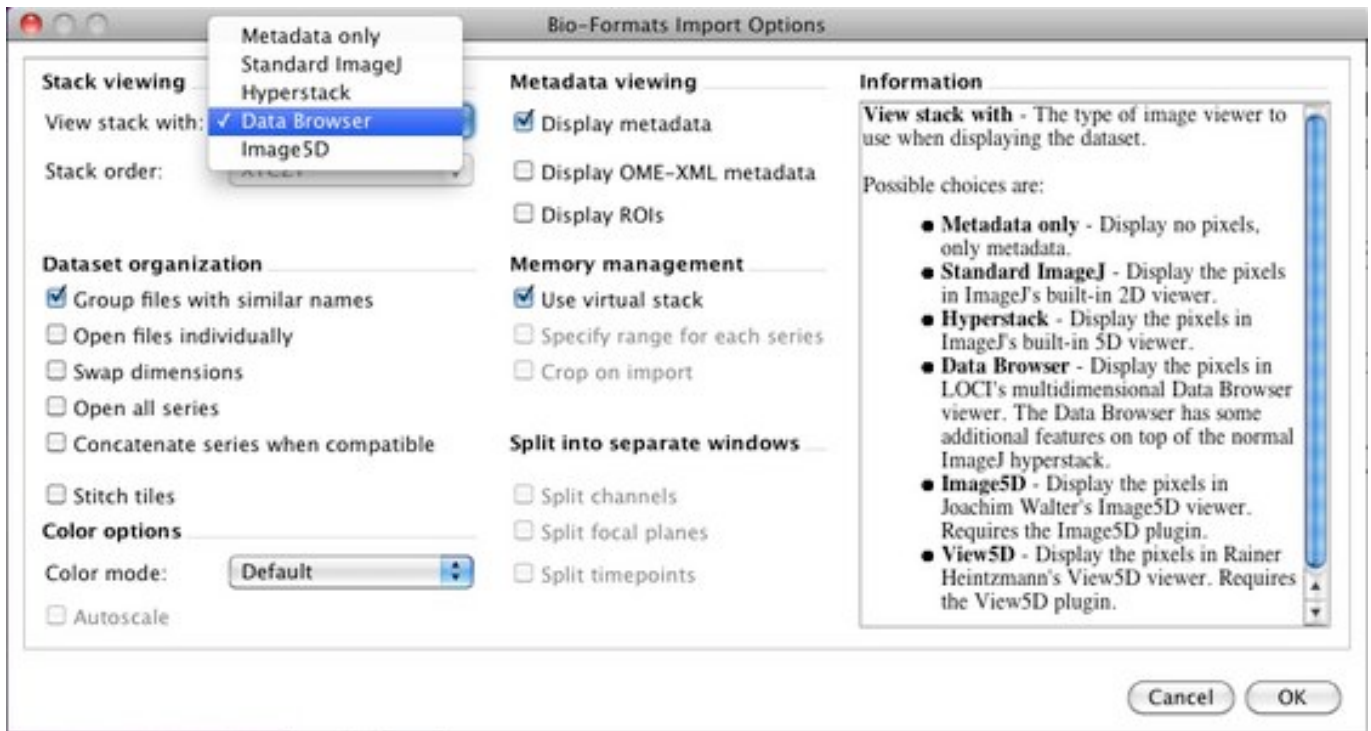
- View your stack with Data Browser
- Crop the view area
- Open only a subset of images
- Use Virtual Stack
- Increase ImageJ/Fiji's memory.

If your files contain JPEG or JPEG-2000 images, you may see this memory warning even if your file size is smaller than the amount of allocated memory. This is because compressed images like JPEG need to be decompressed into memory before being displayed and require more memory than their file size suggests. If you are having this issue, try utilizing one of the memory management tools below.

5.6.1 View your stack with Data Browser

Data Browser is another part of Bio-Formats that enables users to view large 3, 4, or 5-D datasets by caching a subset of all the images available. This enables users to view a stack that is bigger than the computer's memory.

You can select Data Browser as an option for **View stack with**, the leftmost, uppermost option in the **Bio-Formats Import Options** screen.



Note that when you use Data Browser, other features like cropping and specifying range are not available. You can, however, adjust the size of the image cache in the Data Browser after you open the files. You can read more about it on LOCI's [Data Browser page](http://loci.wisc.edu/software/data-browser)⁴².

5.6.2 Cropping the view area

Crop on Import is useful if your images are very large and you are only interested in one specific section of the stack you are importing. If you select this feature, you will see a screen where you can enter the height and width (in pixels) of the part of image you want to see. Note that these measurements are from the top left corner of the image.

5.6.3 Opening only a subset of images

The **Specify Range for Each Series** option is useful for viewing a portion of a data set where all the plane images are encapsulated into one file (e.g. the Zeiss LSM format). If your file has a large quantity of images, you can specify which channels, Z-planes, and times you want to load.

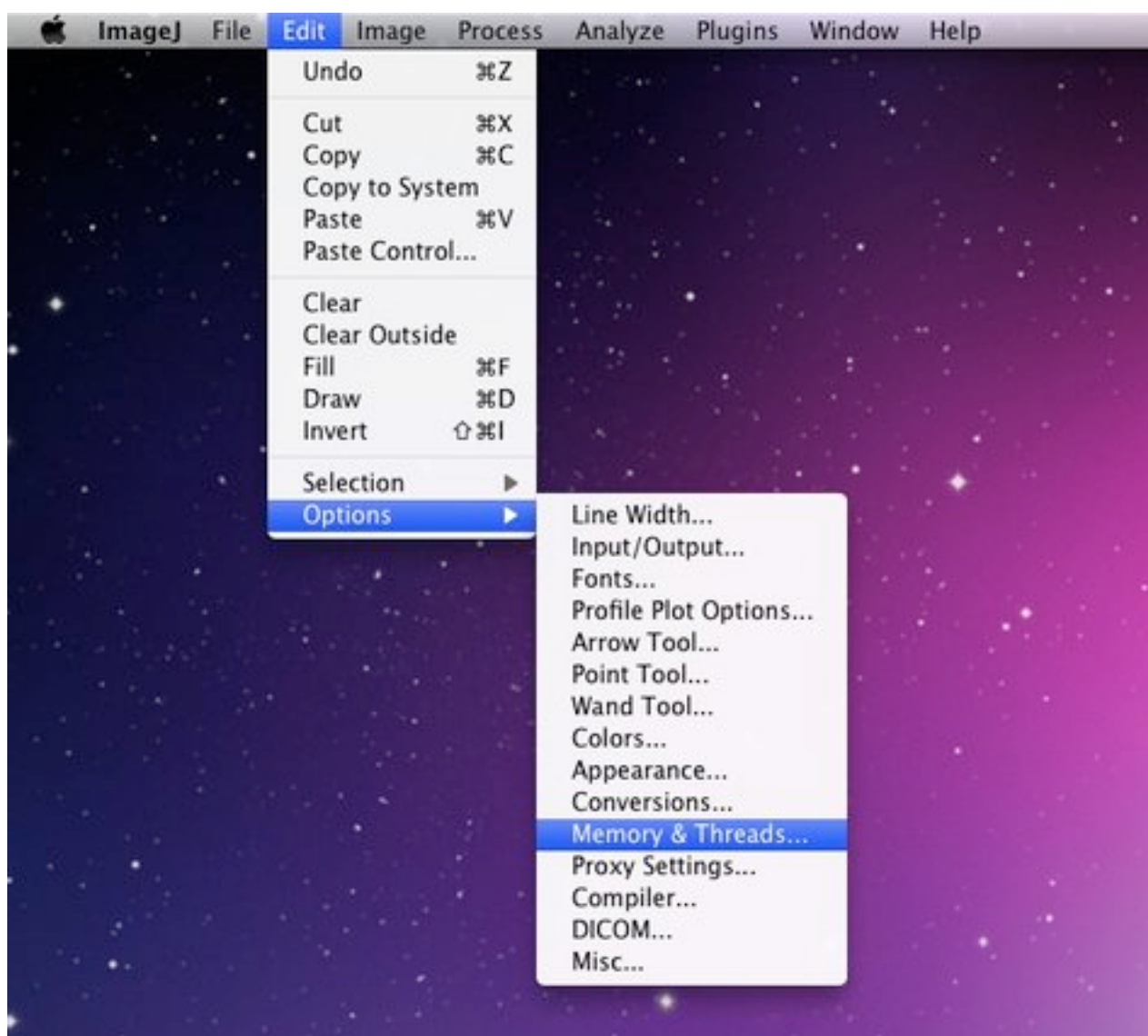
5.6.4 Use Virtual Stack

Virtual Stack conserves memory by not loading specific images until necessary. Note that unlike Data Browser, Virtual Stack does not contain a buffer and may produce choppy animations.

5.6.5 Increasing ImageJ/Fiji's memory

Finally, you can also increase the amount of the computer memory devoted to ImageJ/Fiji by selecting **Memory & Threads** under the **Edit** menu.

⁴²<http://loci.wisc.edu/software/data-browser>



Generally, allocating more than 75% of the computer's total memory will cause ImageJ/Fiji to become slow and unstable.

Please note that unlike the other three features, ImageJ/Fiji itself provides this feature and not Bio-Formats. You can find out more about this feature by looking at ImageJ's [documentation](http://rsbweb.nih.gov/ij/docs/menus/edit.html#options)⁴³.

⁴³<http://rsbweb.nih.gov/ij/docs/menus/edit.html#options>

COMMAND LINE TOOLS

The Bio-Formats Command line tools (bftools.zip) provide a complete package for carrying out a variety of tasks:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](#) or the [previous versions²](#) page to find documentation for the version you are using.

6.1 Command line tools introduction

There are several scripts for using Bio-Formats on the command line.

6.1.1 Installation

Download [bftools.zip³](#), unzip it into a new folder.

Note: As of Bio-Formats 5.0.0, this zip now contains the bundled jar and you no longer need to download `loci_tools.jar` or the new `bioformats_package.jar` separately.

The zip file contains both Unix scripts and Windows batch files.

6.1.2 Tools available

Currently available tools include:

showinf Prints information about a given image file to the console, and displays the image itself in the Bio-Formats image viewer (see [Displaying images and metadata](#) for more information).

ijview Displays the given image file in ImageJ using the Bio-Formats Importer plugin. See [Display file in ImageJ](#) for details.

bfconvert Converts an image file from one format to another. Bio-Formats must support writing to the output file (see [Converting a file to different format](#) for more information).

formatlist Displays a list of supported file formats in HTML, plaintext or XML. See [List supported file formats](#) for details.

xmlindent A simple XML prettifier similar to **xmllint -format** but more robust in that it attempts to produce output regardless of syntax errors in the XML. See [Format XML data](#) for details.

xmlvalid A command-line XML validation tool, useful for checking an OME-XML document for compliance with the OME-XML schema.

tiffcomment Dumps the comment from the given TIFF file's first IFD entry; useful for examining the OME-XML block in an OME-TIFF file (also see [Editing XML in an OME-TIFF](#)).

domainlist Displays a list of imaging domains and the supported formats associated with each domain. See [List formats by domain](#) for more information.

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

³<http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/bftools.zip>

mkfake Creates a “fake” high-content screen with configurable dimensions. This is useful for testing how HCS metadata is handled, without requiring real image data from an acquired screen. See [Create a high-content screen for testing](#) for more information.

Some of these tools also work in combination, for example *Validating XML in an OME-TIFF* uses both **tiffcomment** and **xmlvalid**.

Running any of these commands without any arguments will print usage information to help you. When run with the `-version` argument, **showinf** and **bfconvert** will display the version of Bio-Formats that is being used (version number, build date, and Git commit reference).

6.1.3 Using the tools directly from source

Firstly, obtain a copy of the sources and build them (see [Obtaining and building Bio-Formats](#)). You can configure the scripts to use your source tree instead of **bioformats_package.jar** in the same directory by following these steps:

1. Point your CLASSPATH to the checked-out directory and the JAR files in the **jar** folder.
 - E.g. on Windows with Java 1.6 or later, if you have checked out the source at `C:\code\bio-formats`, set your CLASSPATH environment variable to the value `C:\code\bio-formats\jar*;C:\code\bio-formats`. You can access the environment variable configuration area by right-clicking on My Computer, choosing Properties, Advanced tab, Environment Variables button.
2. Compile the source with `ant compile`.
3. Set the `BF_DEVEL` environment variable to any value (the variable just needs to be defined).

6.1.4 Version checker

If you run **bftools** outside of the OMERO environment, you may encounter an issue with the automatic version checker causing a tool to crash when trying to connect to `upgrade.openmicroscopy.org.uk`. The error message will look something like this:

```
Failed to compare version numbers
java.io.IOException: Server returned HTTP response code: 400 for URL:
http://upgrade.openmicroscopy.org.uk?version=4.4.8;os.name=Linux;os.
version=2.6.32-358.6.2.el6.x86_64;os.arch=amd64;java.runtime.version=
1.6.0_24-b24;java.vm.vendor=Sun+Microsystems+Inc.;bioformats.caller=
Bio-Formats+utilities
```

To avoid this issue, call the tool with the `-no-upgrade` parameter.

6.1.5 Profiling

For debugging errors or investigating performance issues, it can be useful to use profiling tools while running Bio-Formats. The command-line tools can invoke the [HPROF](#)⁴ agent library to profile Heap and CPU usage. Setting the `BF_PROFILE` environment variable allows to turn profiling on, e.g.:

```
BF_PROFILE=true showinf -nopix -no-upgrade myfile
```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵ or the [previous versions](#)⁶ page to find documentation for the version you are using.

⁴<http://docs.oracle.com/javase/7/docs/technotes/samples/hprof.html>

⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶<http://www.openmicroscopy.org/site/support/legacy/>

6.2 Displaying images and metadata

The **showinf** *command line tool* can be used to show the images and metadata contained in a file.

If no options are specified, **showinf** displays a summary of available options.

To simply display images:

```
showinf /path/to/file
```

All of the images in the first ‘series’ (or 5 dimensional stack) will be opened and displayed in a simple image viewer. The number of series, image dimensions, and other basic metadata will be printed to the console.

-series SERIES

Displays a different series, for example the second one:

```
showinf -series 1 /path/to/file
```

Note that series numbers begin with 0.

-omexml

Displays the OME-XML metadata for a file on the console:

```
showinf -omexml /path/to/file
```

-nopix

Image reading can be suppressed if only the metadata is needed:

```
showinf -nopix /path/to/file
```

-range START END

A subset of images can also be opened instead of the entire stack, by specifying the start and end plane indices (inclusive):

```
showinf -range 0 0 /path/to/file
```

That opens only the first image in first series in the file.

-crop X, Y, WIDTH, HEIGHT

For very large images, it may also be useful to open a small tile from the image instead of reading everything into memory. To open the upper-left-most 512x512 tile from the images:

```
showinf -crop 0,0,512,512 /path/to/file
```

The parameter to **-crop** is of the format `x, y, width, height`. The (x, y) coordinate (0, 0) is the upper-left corner of the image; `x + width` must be less than or equal to the image width and `y + height` must be less than or equal to the image height.

-no-upgrade

By default, **showinf** will check for a new version of Bio-Formats. This can take several seconds (especially on a slow internet connection); to save time, the update check can be disabled:

```
showinf -no-upgrade /path/to/file
```

-no-valid

Similarly, if OME-XML is displayed then it will automatically be validated. On slow or missing internet connections, this can take some time, and so can be disabled:

```
showinf -novalid /path/to/file
```

-no-core

Most output can be suppressed:

```
showinf -nocore /path/to/file
```

-omexml-only

Displays the OME-XML alone:

```
showinf -omexml-only /path/to/file
```

This is particularly helpful when there are hundreds or thousands of series.

-debug

Enables debugging output if more information is needed:

```
showinf -debug /path/to/file
```

-fast

Displays an image as quickly as possible. This is achieved by converting the raw data into a 8 bit RGB image:

```
showinf -fast /path/to/file
```

Note: Due to the data conversion to a RGB image, using this option results in a loss of precision.

-autoscale

Adjusts the display range to the minimum and maximum pixel values:

```
showinf -autoscale /path/to/file
```

Note: This option automatically sets the *-fast* option and suffers from the same limitations.

-cache

Caches the reader under the same directory as the input file after initialization:

```
showinf -cache /path/to/file
```

-cache-dir DIR

Specifies the base directory under which the reader should be cached:

```
showinf -cache-dir /tmp/cachedir /path/to/file
```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](http://www.openmicroscopy.org/site/support/bio-formats5.0/)⁷ or the [previous versions](http://www.openmicroscopy.org/site/support/legacy/)⁸ page to find documentation for the version you are using.

⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸<http://www.openmicroscopy.org/site/support/legacy/>

6.3 Converting a file to different format

The **bfconvert** *command line tool* can be used to convert files between *supported formats*.

bfconvert with no options displays a summary of available options.

To convert a file to single output file (e.g. TIFF):

```
bfconvert /path/to/input output.tiff
```

The output file format is determined by the extension of the output file, e.g. `.tiff` for TIFF files, `.ome.tiff` for OME-TIFF, `.png` for PNG.

-series SERIES

All images in the input file are converted by default. To convert only one series:

```
bfconvert -series 0 /path/to/input output-first-series.tiff
```

-timepoint TIMEPOINT

To convert only one timepoint:

```
bfconvert -timepoint 0 /path/to/input output-first-timepoint.tiff
```

-channel CHANNEL

To convert only one channel:

```
bfconvert -channel 0 /path/to/input output-first-channel.tiff
```

-z Z

To convert only one Z section:

```
bfconvert -z 0 /path/to/input output-first-z.tiff
```

-range START END

To convert images between certain indices (inclusive):

```
bfconvert -range 0 2 /path/to/input output-first-3-images.tiff
```

-tilex TILEX, **-tiley** TILEY

All images larger than 4096x4096 will be saved as a set of tiles if the output format supports doing so. The default tile size is determined by the input format, and can be overridden like this:

```
bfconvert -tilex 512 -tiley 512 /path/to/input output-512x512-tiles.tiff
```

`-tilex` is the width in pixels of each tile; `-tiley` is the height in pixels of each tile. The last row and column of tiles may be slightly smaller if the image width and height are not multiples of the specified tile width and height. Note that specifying `-tilex` and `-tiley` will cause tiles to be written even if the image is smaller than 4096x4096.

Also note that the specified tile size will affect performance. If large amounts of data are being processed, it is a good idea to try converting a single tile with a few different tile sizes using the `-crop` option. This gives an idea of what the most performant size will be.

Images can also be written to multiple files by specifying a pattern string in the output file. For example, to write one series, timepoint, channel, and Z section per file:


```
bfconvert /path/to/input output_series_%s_Z%z_C%c_T%t.tiff
```

%s is the series index, %z is the Z section index, %c is the channel index, and %t is the timepoint index (all indices begin at 0).

For large images in particular, it can also be useful to write each tile to a separate file:

```
bfconvert -tilex 512 -tiley 512 /path/to/input output_tile_%x_%y_%m.jpg
```

%x is the row index of the tile, %y is the column index of the tile, and %m is the overall tile index. As above, all indices begin at 0. Note that if %x or %y is included in the file name pattern, then the other must be included too. The only exception is if %m was also included in the pattern.

-compression COMPRESSION

By default, all images will be written uncompressed. Supported compression modes vary based upon the output format, but when multiple modes are available the compression can be changed using the *-compression* option. For example, to use LZW compression in a TIFF file:

```
bfconvert -compression LZW /path/to/input output-lzw.tiff
```

-overwrite

If the specified output file already exists, **bfconvert** will prompt to overwrite the file. When running **bfconvert** non-interactively, it may be useful to always allow **bfconvert** to overwrite the output file:

```
bfconvert -overwrite /path/to/input /path/to/output
```

-nooverwrite

To always exit without overwriting:

```
bfconvert -nooverwrite /path/to/input /path/to/output
```

-bigtiff

This option forces the writing of a BigTiff file:

```
bfconvert -bigtiff /path/to/input output.ome.tiff
```

New in version 5.1.2: The *-bigtiff* option is not necessary if a BigTiff extension is used for the output file, e.g.:

```
bfconvert /path/to/input output.ome.btf
```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](http://www.openmicroscopy.org/site/support/bio-formats5.0/)⁹ or the [previous versions](http://www.openmicroscopy.org/site/support/legacy/)¹⁰ page to find documentation for the version you are using.

6.4 Validating XML in an OME-TIFF

The XML stored in an OME-TIFF file can be validated using the *command line tools*.

Both the **tiffcomment** and **xmlvalid** commands are used; **tiffcomment** extracts the XML from the file and **xmlvalid** validates the XML and prints any errors to the console.

For example:

⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰<http://www.openmicroscopy.org/site/support/legacy/>


```
tiffcomment /path/to/file.ome.tiff | xmlvalid -
```

will perform the extraction and validation all at once.

Typical successful output is:

```
[~/Work/bftools]$ ./xmlvalid sample.ome
Parsing schema path
http://www.openmicroscopy.org/Schemas/OME/2010-06/ome.xsd
Validating sample.ome
No validation errors found.
[~/Work/bftools]$
```

If any errors are found they are reported. When correcting errors it is usually best to work from the top of the file as errors higher up can cause extra errors further down. In this example the output shows 3 errors but there are only 2 mistakes in the file:

```
[~/Work/bftools]$ ./xmlvalid broken.ome
Parsing schema path
http://www.openmicroscopy.org/Schemas/OME/2010-06/ome.xsd
Validating broken.ome
cvc-complex-type.4: Attribute 'SizeY' must appear on element 'Pixels'.
cvc-enumeration-valid: Value 'Non Zero' is not facet-valid with respect
  to enumeration '[EvenOdd, NonZero]'. It must be a value from the enumeration.
cvc-attribute.3: The value 'Non Zero' of attribute 'FillRule' on element
  'ROI:Shape' is not valid with respect to its type, 'null'.
Error validating document: 3 errors found
[~/Work/bftools]$
```

If the XML is found to have validation errors, the **tiffcomment** command can be used to overwrite the XML in the OME-TIFF file with corrected XML. The XML can be displayed in an editor window:

```
tiffcomment -edit /path/to/file.ome.tiff
```

or the new XML can be read from a file:

```
tiffcomment -set new-comment.xml /path/to/file.ome.tiff
```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](http://www.openmicroscopy.org/site/support/bio-formats5.0/)¹¹ or the [previous versions](http://www.openmicroscopy.org/site/support/legacy/)¹² page to find documentation for the version you are using.

6.5 Editing XML in an OME-TIFF

To edit the XML in an OME-TIFF file you can use **tiffcomment**, one of the Bio-Formats tools.

To use the built in editor run:

```
tiffcomment -edit sample.ome.tif
```

To extract or view the XML run:

¹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹²<http://www.openmicroscopy.org/site/support/legacy/>

```
tiffcomment sample.ome.tif
```

To inject replacement XML into a file run:

```
tiffcomment -set 'newmetadata.xml' sample.ome.tif
```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹³](#) or the [previous versions¹⁴](#) page to find documentation for the version you are using.

6.6 List formats by domain

Each supported file format has one or more imaging domains associated with it. To print the list of formats associated with each imaging domain:

```
domainlist
```

The command does not accept any arguments. The known image domains are defined by:

- [ASTRONOMY_DOMAIN¹⁵](#)
- [EM_DOMAIN¹⁶](#)
- [FLIM_DOMAIN¹⁷](#)
- [GEL_DOMAIN¹⁸](#)
- [GRAPHICS_DOMAIN¹⁹](#)
- [HCS_DOMAIN²⁰](#)
- [HISTOLOGY_DOMAIN²¹](#)
- [LM_DOMAIN²²](#)
- [MEDICAL_DOMAIN²³](#)
- [SEM_DOMAIN²⁴](#)
- [SPM_DOMAIN²⁵](#)
- [UNKNOWN_DOMAIN²⁶](#)

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁷](#) or the [previous versions²⁸](#) page to find documentation for the version you are using.

¹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁴<http://www.openmicroscopy.org/site/support/legacy/>

¹⁵http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#ASTRONOMY_DOMAIN

¹⁶http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#EM_DOMAIN

¹⁷http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#FLIM_DOMAIN

¹⁸http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#GEL_DOMAIN

¹⁹http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#GRAPHICS_DOMAIN

²⁰http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#HCS_DOMAIN

²¹http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#HISTOLOGY_DOMAIN

²²http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#LM_DOMAIN

²³http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#MEDICAL_DOMAIN

²⁴http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#SEM_DOMAIN

²⁵http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#SPM_DOMAIN

²⁶http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#UNKNOWN_DOMAIN

²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁸<http://www.openmicroscopy.org/site/support/legacy/>

6.7 List supported file formats

A detailed list of supported formats can be displayed using the **formatlist** command.

The default behavior is to print a plain-text list of formats:

```
formatlist
```

-txt

Prints the list of formats as plain-text:

```
formatlist -txt
```

-html

Prints the list of formats as HTML:

```
formatlist -html
```

-xml

Prints the list of formats as XML:

```
formatlist -xml
```

-help

Displays the usage information:

```
formatlist -help
```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁹](#) or the [previous versions³⁰](#) page to find documentation for the version you are using.

6.8 Display file in ImageJ

Files can be displayed from the command line in ImageJ. The Bio-Formats importer plugin for ImageJ is used to open the file.

The command takes a single argument:

```
ijview /file/to/open
```

If the input file is not specified, ImageJ will show a file chooser window.

The Bio-Formats import options window will then appear, after which the image(s) will be displayed.

If the *BF_DEVEL* environment variable is set, the ImageJ `jar <jars/ij.jar>` must be included in the classpath.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³¹](#) or the [previous versions³²](#) page to find documentation for the version you are using.

²⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰<http://www.openmicroscopy.org/site/support/legacy/>

³¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²<http://www.openmicroscopy.org/site/support/legacy/>

6.9 Format XML data

The **xmlindent** command formats and adds indenting to XML so that it is easier to read. Indenting is currently set to 3 spaces.

If an XML file name is not specified, the XML to indent will be read from standard output. Otherwise, one or more file names can be specified:

```
xmlindent /path/to/xml
xmlindent /path/to/first-xml /path/to/second-xml
```

The formatted XML from each file will be printed in the order in which the files were specified.

By default, extra whitespace may be added to CDATA elements. To preserve the contents of CDATA elements:

```
xmlindent -valid /path/to/xml
```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³³](#) or the [previous versions³⁴](#) page to find documentation for the version you are using.

6.10 Create a high-content screen for testing

The **mkfake** command creates a high-content screen for testing. The image data will be meaningless, but it allows testing of screen, plate, and well metadata without having to find appropriately-sized screens from real acquisitions.

If no arguments are specified, **mkfake** prints usage information.

To create a single screen with default plate dimensions:

```
mkfake default-screen.fake
```

This will create a directory that represents one screen with a single plate containing one well, one field, and one acquisition of the plate (see [PlateAcquisition³⁵](#)).

-plates PLATES

To change the number of plates in the screen:

```
mkfake -plates 3 three-plates.fake
```

-runs RUNS

To change the number of acquisitions for each plate:

```
mkfake -runs 4 four-plate-acquisitions.fake
```

-rows ROWS

To change the number of rows of wells in each plate:

```
mkfake -rows 8 eight-row-plate.fake
```

-columns COLUMNS

To change the number of columns of wells in each plate:

³³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁴<http://www.openmicroscopy.org/site/support/legacy/>

³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

```
mkfake -columns 12 twelve-column-plate.fake
```

-fields FIELDS

To change the number of fields per well:

```
mkfake -fields 2 two-field-plate.fake
```

It is often most useful to use the arguments together to create a realistic screen, for example:

```
mkfake -rows 16 -columns 24 -plates 2 -fields 3 two-384-well-plates.fake
```

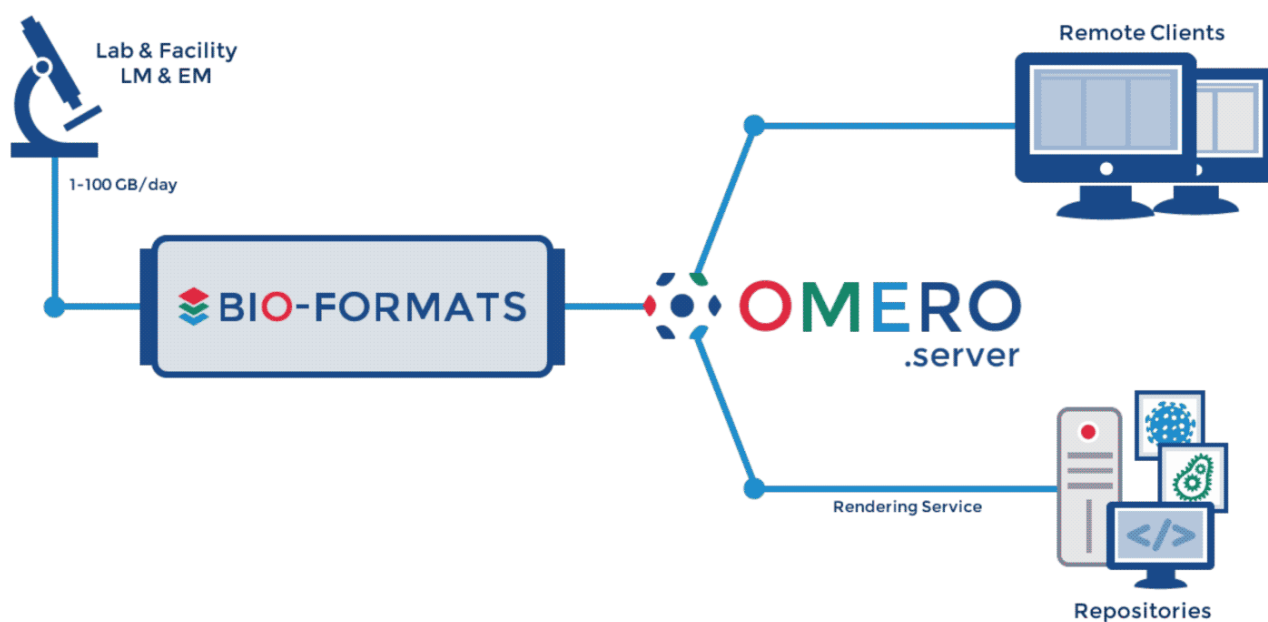
-debug DEBUG

As with other command line tools, debugging output can be enabled if necessary:

```
mkfake -debug debug-screen.fake
```

OMERO

OMERO 5 uses Bio-Formats to read original files from over 140 file formats. Please refer to the [OMERO documentation¹](http://www.openmicroscopy.org/site/support/omero5.1/) for further information.



¹<http://www.openmicroscopy.org/site/support/omero5.1/>

IMAGE SERVER APPLICATIONS

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](#) or the [previous versions²](#) page to find documentation for the version you are using.

8.1 BISQUE

The **BISQUE³** (Bio-Image Semantic Query User Environment) Database, developed at the Center for Bio-Image Informatics at UCSB, was developed for the exchange and exploration of biological images. The Bisque system supports several areas useful for imaging researchers from image capture to image analysis and querying. The bisque system is centered around a database of images and metadata. Search and comparison of datasets by image data and content is supported. Novel semantic analyses are integrated into the system allowing high level semantic queries and comparison of image content.

Bisque integrates with Bio-Formats by calling the *showinf command line tool*.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴](#) or the [previous versions⁵](#) page to find documentation for the version you are using.

8.2 OME Server

OME⁶ is a set of software that interacts with a database to manage images, image metadata, image analysis and analysis results. The OME system is capable of leveraging Bio-Formats to import files.

Please note - the OME server is no longer maintained and has now been superseded by the **OMERO server⁷**. Support for the OME server has been entirely removed in the 5.0.0 version of Bio-Formats; the following instructions can still be used with the 4.4.x versions.

8.2.1 Installation

For **OME Perl v2.6.1⁸** and later, the command line installer automatically downloads the latest **loci_tools.jar** and places it in the proper location. This location is configurable, but is **/OME/java/loci_tools.jar** by default.

For a list of what was recognized for a particular import into the OME server, go to the Image details page in the web interface, and click the “Image import” link in the upper right hand box.

Bio-Formats is capable of parsing original metadata for supported formats, and standardizes what it can into the OME data model. For the rest, it expresses the metadata in OME terms as key/value pairs using an OriginalMetadata custom semantic type. However, this latter method of metadata representation is of limited utility, as it is not a full conversion into the OME data model.

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

³<http://www.bioimage.ucsb.edu/bisque>

⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁶<http://openmicroscopy.org/site/support/legacy/ome-server>

⁷<http://www.openmicroscopy.org/site/support/omero5.1/>

⁸<http://downloads.openmicroscopy.org/ome/2.6.1/>

Bio-Formats is enabled in OME v2.6.1 for all formats except:

- OME-TIFF
- Metamorph HTD
- Deltavision DV
- Metamorph STK
- Bio-Rad PIC
- Zeiss LSM
- TIFF
- BMP
- DICOM
- OME-XML

The above formats have their own Perl importers that override Bio-Formats, meaning that Bio-Formats is not used to process them by default. However, you can override this behavior (except for Metamorph HTD, which Bio-Formats does not support) by editing an OME database configuration value:

```
% psql ome
```

To see the current file format reader list:

```
ome=# select value from configuration where name='import_formats';
value
-----
['OME::ImportEngine::OMETIFFreader', 'OME::ImportEngine::MetamorphHTDFormat',
'OME::ImportEngine::DVreader', 'OME::ImportEngine::STKreader',
'OME::ImportEngine::BioradReader', 'OME::ImportEngine::LSMreader',
'OME::ImportEngine::TIFFreader', 'OME::ImportEngine::BMPreader',
'OME::ImportEngine::DICOMreader', 'OME::ImportEngine::XMLreader',
'OME::ImportEngine::BioFormats']
(1 row)
```

To remove extraneous readers from the list:

```
ome=# update configuration set value=['\OME::ImportEngine::MetamorphHTDFormat\',
'\OME::ImportEngine::XMLreader\', '\OME::ImportEngine::BioFormats\'] where
name='import_formats';
UPDATE 1
ome=# select value from configuration where name='import_formats';
value
-----
['OME::ImportEngine::MetamorphHTDFormat', 'OME::ImportEngine::XMLreader',
'OME::ImportEngine::BioFormats']
(1 row)
```

To reset things back to how they were:

```
ome=# update configuration set value=['\OME::ImportEngine::OMETIFFreader\',
'\OME::ImportEngine::MetamorphHTDFormat\', '\OME::ImportEngine::DVreader\',
'\OME::ImportEngine::STKreader\', '\OME::ImportEngine::BioradReader\',
'\OME::ImportEngine::LSMreader\', '\OME::ImportEngine::TIFFreader\',
'\OME::ImportEngine::BMPreader\', '\OME::ImportEngine::DICOMreader\',
'\OME::ImportEngine::XMLreader\', '\OME::ImportEngine::BioFormats\'] where
name='import_formats';
```


Lastly, please note that Li-Cor L2D files cannot be imported into an OME server (see [this Trac ticket](#)⁹ for details). Since the OME perl server has been discontinued, we have no plans to fix this limitation.

8.2.2 Upgrading

You can upgrade your OME server installation to take advantage of a [new Bio-Formats release](#)¹⁰ by overwriting the old **loci_tools.jar** with the new one.

8.2.3 Source Code

The source code for the Bio-Formats integration with OME server spans three languages, using piped system calls in both directions to communicate, with imported pixels written to OMEIS pixels files. The relevant source files are:

- [OmeisImporter.java](#)¹¹ – omebf Java command line tool
- [BioFormats.pm](#)¹² – Perl module for OME Bio-Formats importer
- [omeis.c](#)¹³ – OMEIS C functions for Bio-Formats (search for “bioformats” case insensitively to find relevant sections)

⁹<http://dev.loci.wisc.edu/trac/software/ticket/266>

¹⁰<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

¹¹<http://github.com/openmicroscopy/bioformats/tree/v4.4.10/components/scifio/src/loci/formats/ome/OmeisImporter.java>

¹²<http://downloads.openmicroscopy.org/ome/code/BioFormats.pm>

¹³<http://downloads.openmicroscopy.org/ome/code/omeis.c>

LIBRARIES AND SCRIPTING APPLICATIONS

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](#) or the [previous versions²](#) page to find documentation for the version you are using.

9.1 FARSIGHT

FARSIGHT³ is a collection of modules for image analysis created by LOCI's collaborators at the [University of Houston⁴](#). These open source modules are built on the *ITK* library and thus can take advantage of ITK's support for Bio-Formats to process otherwise unsupported image formats.

The principal FARSIGHT module that benefits from Bio-Formats is the [Nucleus Editor⁵](#), though in principle any FARSIGHT-based code that reads image formats via the standard ITK mechanism will be able to leverage Bio-Formats.

See also:

[FARSIGHT Downloads page⁶](#)

[FARSIGHT HowToBuild tutorial⁷](#)

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁸](#) or the [previous versions⁹](#) page to find documentation for the version you are using.

9.2 i3dcore

i3dcore¹⁰, also known as the CBIA 3D image representation library, is a 3D image processing library developed at the [Centre for Biomedical Image Analysis¹¹](#). Together with [i3dalgo¹²](#) and [i4dcore¹³](#), i3dcore forms a continuously developed templated cross-platform C++ suite of libraries for multidimensional image processing and analysis.

i3dcore is capable of reading images with Bio-Formats using [Java for C++¹⁴](#) (java4cpp).

See also:

[Download i3dcore¹⁵](#)

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

³<http://www.farsight-toolkit.org/>

⁴<http://www.uh.edu/>

⁵<http://www.farsight-toolkit.org/wiki/NucleusEditor>

⁶<http://www.farsight-toolkit.org/wiki/Special:FarsightDownloads>

⁷http://www.farsight-toolkit.org/wiki/FARSIGHT_HowToBuild

⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹<http://www.openmicroscopy.org/site/support/legacy/>

¹⁰http://cbia.fi.muni.cz/user_dirs/i3dlib_doc/i3dcore/index.html

¹¹<http://cbia.fi.muni.cz/software-development.html>

¹²http://cbia.fi.muni.cz/user_dirs/i3dlib_doc/i3dalgo/index.html

¹³http://cbia.fi.muni.cz/user_dirs/of_doc/libi4d.html

¹⁴<http://java4cpp.kapott.org/>

¹⁵http://cbia.fi.muni.cz/user_dirs/i3dlib_doc/i3dcore/index.html#download

CBIA Software Development¹⁶

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁷](#) or the [previous versions¹⁸](#) page to find documentation for the version you are using.

9.3 ImgLib

ImgLib2¹⁹ is a multidimensional image processing library. It provides a general mechanism for writing image analysis algorithms, without writing case logic for [bit depth²⁰](#), or worrying about the source of the pixel data (arrays in memory, files on disk, etc.).

The SCIFIO²¹ project provides an [ImgOpener²²](#) utility class for reading data into ImgLib2 data structures using Bio-Formats.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²³](#) or the [previous versions²⁴](#) page to find documentation for the version you are using.

9.4 ITK

The [Insight Toolkit²⁵](#) (ITK) is an open-source, cross-platform system that provides developers with an extensive suite of software tools for image analysis. Developed through extreme programming methodologies, ITK employs leading-edge algorithms for registering and segmenting multidimensional data.

ITK provides an ImageIO plug-in structure that works via discovery through a dependency injection scheme. This allows a program built on ITK to load plug-ins for reading and writing different image types without actually linking to the ImageIO libraries required for those types. Such encapsulation automatically grants two major boons: firstly, programs can be easily extended just by virtue of using ITK (developers do not have to specifically accommodate or anticipate what plug-ins may be used). Secondly, the architecture provides a distribution method for open source software, like Bio-Formats, which have licenses that might otherwise exclude them from being used with other software suites.

The SCIFIO [ImageIO²⁶](#) plugin provides an ITK imageIO base that uses Bio-Formats to read and write supported life sciences file formats. This plugin allows any program built on ITK to read any of the image types supported by Bio-Formats.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁷](#) or the [previous versions²⁸](#) page to find documentation for the version you are using.

9.5 Qu for MATLAB

Qu for MATLAB²⁹ is a MATLAB toolbox for the visualization and analysis of N-dimensional datasets targeted to the field of biomedical imaging, developed by Aaron Ponti.

- Uses Bio-Formats to read files
- Open source software available under the Mozilla Public License

¹⁶<http://cbia.fi.muni.cz/software-development.html>

¹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁹<http://imglib2.net/>

²⁰http://en.wikipedia.org/wiki/Color_depth

²¹<http://scif.io/>

²²<https://github.com/scifio/scifio/blob/master/src/main/java/io/scif/img/ImgOpener.java>

²³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴<http://www.openmicroscopy.org/site/support/legacy/>

²⁵<http://itk.org/>

²⁶<https://github.com/scifio/scifio-imageio>

²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁸<http://www.openmicroscopy.org/site/support/legacy/>

²⁹http://www.scs2.net/home/index.php?option=com_content&view=article&id=46%3Aqu-for-matlab&catid=34%3Aqu&Itemid=55

See also:

[Qu for MATLAB download page](#)³⁰

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³¹ or the [previous versions](#)³² page to find documentation for the version you are using.

9.6 Subimager

[Subimager](#)³³, the SUBprocess IMAGE servER, is an HTTP server that uses Bio-Formats as a back-end to serve .TIF images. Subimager is designed to be run as a subprocess of CellProfiler to provide CellProfiler with the capability to read and write a variety of image formats. It can be used as a stand-alone image server. It was developed by the [Broad Institute](#)³⁴ to facilitate integration with their [CellProfiler](#)³⁵ image analysis application.

³⁰http://www.scs2.net/home/index.php?option=com_content&view=article&id=46%3Aqu-for-matlab&catid=34%3Aqu&Itemid=55&limitstart=3

³¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²<http://www.openmicroscopy.org/site/support/legacy/>

³³<https://github.com/CellProfiler/subimager>

³⁴<http://www.broadinstitute.org/>

³⁵<http://www.cellprofiler.org/>

NUMERICAL DATA PROCESSING APPLICATIONS

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](#) or the [previous versions²](#) page to find documentation for the version you are using.

10.1 IDL

IDL³ (Interactive Data Language) is a popular data visualization and analysis platform used for interactive processing of large amounts of data including images.

IDL possesses the ability to interact with Java applications via its IDL-Java bridge. Karsten Rodenacker has written a script that uses Bio-Formats to read in image files to IDL.

10.1.1 Installation

Download the `ij_read_bio_formats.pro`⁴ script from Karsten Rodenacker's [IDL goodies \(?\)](#)⁵ web site. See the comments at the top of the script for installation instructions and caveats.

10.1.2 Upgrading

To use a newer version of Bio-Formats, overwrite the requisite JAR files with the [newer version⁶](#) and restart IDL.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁷](#) or the [previous versions⁸](#) page to find documentation for the version you are using.

10.2 KNIME

KNIME⁹ (Konstanz Information Miner) is a user-friendly and comprehensive open-source data integration, processing, analysis, and exploration platform. KNIME supports image import using Bio-Formats using the [KNIME Image Processing](#)¹⁰ (a.k.a. KNIP) plugin.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹¹](#) or the [previous versions¹²](#) page to find documentation for the version you are using.

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

³<http://www.exelisvis.com/ProductsServices/IDL.aspx>

⁴http://karo03.bplaced.net/karo/IDL/_pro/ij_read_bio_formats.pro

⁵http://karo03.bplaced.net/karo/ro_embed.php?file=IDL/index.html

⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁹<http://www.knime.org/>

¹⁰<http://tech.knime.org/community/image-processing>

¹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹²<http://www.openmicroscopy.org/site/support/legacy/>

10.3 MATLAB

MATLAB¹³ is a high-level language and interactive environment that facilitates rapid development of algorithms for performing computationally intensive tasks.

Calling Bio-Formats from MATLAB is fairly straightforward, since MATLAB has built-in interoperability with Java. We have created a [set of scripts](#)¹⁴ for reading image files. Note the minimum supported MATLAB version is R2007b (7.5).

10.3.1 Installation

Download the MATLAB toolbox from the Bio-Formats [downloads page](#)¹⁵. Unzip `bformatlab.zip` and add the unzipped `bformatlab` folder to your MATLAB path.

Note: As of Bio-Formats 5.0.0, this zip now contains the bundled jar and you no longer need to download `loci_tools.jar` or the new `bioformats_package.jar` separately.

10.3.2 Usage

Please see *Using Bio-Formats in MATLAB* for usage instructions. If you intend to extend the existing `.m` files, please also see the *developer page* for more information on how to use Bio-Formats in general.

10.3.3 Performance

In our tests (MATLAB R14 vs. java 1.6.0_20), the script executes at approximately half the speed of our *showinf command line tool*, due to overhead from copying arrays.

10.3.4 Upgrading

To use a newer version of Bio-Formats, overwrite the content of the `bformatlab` folder with the [newer version](#)¹⁶ of the toolbox and restart MATLAB.

10.3.5 Alternative scripts

Several other groups have developed their own MATLAB scripts that use Bio-Formats, including the following:

- <https://github.com/prakatmac/bf-tools/>
- [imread for multiple life science image file formats](#)¹⁷

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁸ or the [previous versions](#)¹⁹ page to find documentation for the version you are using.

¹³<http://www.mathworks.com/products/matlab/>

¹⁴<https://github.com/openmicroscopy/bioformats/tree/develop/components/formats-gpl/matlab>

¹⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

¹⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

¹⁷<http://www.mathworks.com/matlabcentral/fileexchange/32920-imread-for-multiple-life-science-image-file-formats>

¹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹<http://www.openmicroscopy.org/site/support/legacy/>

10.4 VisAD

The **VisAD**²⁰ visualization toolkit is a Java component library for interactive and collaborative visualization and analysis of numerical data. VisAD uses Bio-Formats to read many image formats, notably TIFF.

10.4.1 Installation

The **visad.jar** file has Bio-Formats bundled inside, so no further installation is necessary.

10.4.2 Upgrading

It should be possible to use a newer version of Bio-Formats by putting the latest **bioformats_package.jar**²¹ or **formats-gpl.jar**²² before **visad.jar** in the class path. Alternately, you can create a “VisAD Lite” using the `make lite` command from VisAD source, and use the resultant **visad-lite.jar**, which is a stripped down version of VisAD without sample applications or Bio-Formats bundled in.

²⁰<http://www.ssec.wisc.edu/%7Ebillh/visad.html>

²¹http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/bioformats_package.jar

²²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/formats-gpl.jar>

VISUALIZATION AND ANALYSIS APPLICATIONS

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](#) or the [previous versions²](#) page to find documentation for the version you are using.

11.1 Bitplane Imaris

Imaris³ is Bitplane's core scientific software module that delivers all the necessary functionality for data visualization, analysis, segmentation and interpretation of 3D and 4D microscopy datasets. Combining speed, precision and ease-of-use, Imaris provides a complete set of features for working with three- and four-dimensional multi-channel images of any size, from a few megabytes to multiple gigabytes in size.

As of version 7.2⁴, Imaris integrates with *Fiji overview*, which includes Bio-Formats. See [this page⁵](#) for a detailed list of Imaris' features.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁶](#) or the [previous versions⁷](#) page to find documentation for the version you are using.

11.2 CellProfiler

CellProfiler⁸—developed by the [Broad Institute Imaging Platform⁹](#)—is free open-source software designed to enable biologists without training in computer vision or programming to quantitatively measure phenotypes from thousands of images automatically. CellProfiler uses Bio-Formats to read images from disk, as well as write movies.

11.2.1 Installation

The CellProfiler distribution comes with Bio-Formats included, so no further installation is necessary.

11.2.2 Upgrading

It should be possible to use a newer version of Bio-Formats by replacing the bundled **loci_tools.jar** with a newer version.

- For example, on Mac OS X, Ctrl+click the CellProfiler icon, choose *Show Package Contents*, and replace the following files:

– Contents/Resources/bioformats/loci_tools.jar

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

³<http://www.bitplane.com/>

⁴<http://www.bitplane.com/releasenotes.aspx?product=Imaris&version=7.2&patch=0>

⁵<http://www.bitplane.com/Imaris/Imaris>

⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁸<http://www.cellprofiler.org>

⁹<http://www.broadinstitute.org/science/platforms/imaging/imaging-platform>

– `Contents/Resources/lib/python2.5/bioformats/loci_tools.jar`

See also:

CellProfiler¹⁰ Website of the CellProfiler software

Using Bio-Formats in Python Section of the developer documentation describing the Python wrapper for Bio-Formats used by CellProfiler

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹¹ or the [previous versions](#)¹² page to find documentation for the version you are using.

11.3 Comstat2

Comstat2 is a Java-based computer program for the analysis and treatment of biofilm images in 3D. It is the Master's project of Martin Vorregaard¹³.

Comstat2 uses the *Bio-Formats Importer plugin for ImageJ* to read files in TIFF and Leica LIF formats.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁴ or the [previous versions](#)¹⁵ page to find documentation for the version you are using.

11.4 Endrov

Endrov¹⁶ (or <http://www.endrov.net>) (EV) is a multi-purpose image analysis program developed by the Thomas Burglin group¹⁷ at Karolinska Institute¹⁸, Department of Biosciences and Nutrition.

11.4.1 Installation

The EV distribution comes bundled with the core Bio-Formats library (**bio-formats.jar**), so no further installation is necessary.

11.4.2 Upgrading

It should be possible to use a newer version of Bio-Formats by downloading the latest [formats-gpl.jar](#)¹⁹ and putting it into the `libs` folder of the EV distribution, overwriting the old file.

You could also include some *optional libraries*, to add support for additional formats, if desired.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁰ or the [previous versions](#)²¹ page to find documentation for the version you are using.

¹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹²<http://www.openmicroscopy.org/site/support/legacy/>

¹³<http://www.comstat.dk/>

¹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹⁶<https://github.com/mahogny/Endrov>

¹⁷<http://www.biosci.ki.se/groups/tbu>

¹⁸<http://www.ki.se/>

¹⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/formats-gpl.jar>

²⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²¹<http://www.openmicroscopy.org/site/support/legacy/>

11.5 FocalPoint

FocalPoint²² is an image browser, similar to Windows Explorer²³ or other file manager²⁴ application, specifically designed to work with more complex image types. FocalPoint uses Bio-Formats to generate thumbnails for some formats.

11.5.1 Installation

FocalPoint is bundled with Bio-Formats, so no further installation is necessary.

11.5.2 Upgrading

It should be possible to use a newer version of Bio-Formats²⁵ by overwriting the old **loci_tools.jar** within the FocalPoint distribution. For Mac OS X, you will have to control click the FocalPoint program icon, choose “Show Package Contents” and navigate into Contents/Resources/Java to find the **loci_tools.jar** file.

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁶ or the previous versions²⁷ page to find documentation for the version you are using.

11.6 Graphic Converter

Graphic Converter²⁸ is a Mac OS application for opening, editing, and organizing photos. Versions 6.4.1 and later use Bio-Formats to open all file formats supported by Bio-Formats.

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁹ or the previous versions³⁰ page to find documentation for the version you are using.

11.7 Icy

Icy³¹ is an open-source image analysis and visualization software package that combines a user-friendly graphical interface with the ability to write scripts and plugins that can be uploaded to a centralized website. It uses Bio-Formats internally to read images and acquisition metadata, so no further installation is necessary.

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³² or the previous versions³³ page to find documentation for the version you are using.

11.8 imago

Mayachitra imago³⁴ is an advanced desktop image management package that enables scientists to easily store, manage, search, and analyze 5D biological images and their analysis results. imago integrates flexible annotation and metadata management with advanced image analysis tools.

²²<http://www.bioinformatics.bbsrc.ac.uk/projects/focalpoint/>

²³http://en.wikipedia.org/wiki/Windows_Explorer

²⁴http://en.wikipedia.org/wiki/File_manager

²⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

²⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁷<http://www.openmicroscopy.org/site/support/legacy/>

²⁸<http://www.lemkesoft.com>

²⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰<http://www.openmicroscopy.org/site/support/legacy/>

³¹<http://icy.bioimageanalysis.org/>

³²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³³<http://www.openmicroscopy.org/site/support/legacy/>

³⁴<http://mayachitra.com/imago/index.html>

imago uses Bio-Formats to read files in some formats, including Bio-Rad PIC, Image-Pro Workspace, Metamorph TIFF, Leica LCS LEI, Olympus FluoView FV1000, Nikon NIS-Elements ND2, and Zeiss LSM.

A free 30-day trial version of imago is available [here](#)³⁵.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁶ or the [previous versions](#)³⁷ page to find documentation for the version you are using.

11.9 Iqm

Iqm³⁸ is an image processing application written in Java. It is mainly constructed around the Java JAI library and furthermore it incorporates the functionality of the popular ImageJ image processing software.

Because iqm integrates with ImageJ, it can take advantage of the *Bio-Formats ImageJ plugin* to read image data.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁹ or the [previous versions](#)⁴⁰ page to find documentation for the version you are using.

11.10 Macnification

Macnification⁴¹ is a Mac OS X application for organizing, editing, analyzing and annotating microscopic images, designed for ease of use. It is being developed by Orbicule⁴².

Macnification uses Bio-Formats to read files in some formats, including Gatan DM3, ICS, ImagePro SEQ, ImagePro IPW, Metamorph STK, OME-TIFF and Zeiss LSM.

See also:

[Free trial download](#)⁴³

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁴ or the [previous versions](#)⁴⁵ page to find documentation for the version you are using.

11.11 MIPAV

The MIPAV⁴⁶ (Medical Image Processing, Analysis, and Visualization) application—developed at the [Center for Information Technology](#)⁴⁷ at the [National Institutes of Health](#)⁴⁸—enables quantitative analysis and visualization of medical images of numerous modalities such as PET, MRI, CT, or microscopy. You can use Bio-Formats as a plugin for MIPAV to read images in the formats it supports.

11.11.1 Installation

Follow these steps to install the Bio-Formats plugin for MIPAV:

³⁵<http://mayachitra.com/imago/download-trial.php>

³⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷<http://www.openmicroscopy.org/site/support/legacy/>

³⁸<http://code.google.com/p/iqm/>

³⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁴¹<http://www.orbicule.com/macnification/>

⁴²<http://www.orbicule.com>

⁴³<http://www.orbicule.com/macnification/download>

⁴⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁶<http://mipav.cit.nih.gov/>

⁴⁷<http://cit.nih.gov/>

⁴⁸<http://nih.gov/>

1. Download [bioformats_package.jar](#)⁴⁹ and drop it into your MIPAV folder.
2. Download the [plugin source code](#)⁵⁰ into your user `mipav/plugins` folder.
3. From the command line, compile the plugin with:

```
cd mipav/plugins
javac -cp $MIPAV:$MIPAV/bioformats\_package.jar \
  PlugInBioFormatsImporter.java
```

4. where `$MIPAV` is the location of your MIPAV installation.
5. Add **bioformats_package.jar** to MIPAV's class path:
 - How to do so depends on your platform.
 - E.g., in Mac OS X, edit the `mipav.app/Contents/Info.plist` file.
6. Run MIPAV and a new "BioFormatsImporter - read image" menu item will appear in the Plugins > File submenu.

See the [readme file](#)⁵¹ for more information.

To upgrade, just overwrite the old **bioformats_package.jar** with the [latest one](#)⁵². You may want to download the latest version of MIPAV first, to take advantage of new features and bug-fixes.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵³ or the [previous versions](#)⁵⁴ page to find documentation for the version you are using.

11.12 Vaa3D

Vaa3D⁵⁵, developed by the [Peng Lab](#)⁵⁶ at the [HHMI Janelia Farm Research Campus](#)⁵⁷, is a handy, fast, and versatile 3D/4D/5D Image Visualization & Analysis System for Bioimages & Surface Objects.

Vaa3D can use Bio-Formats via the [Bio-Formats C++ bindings](#)⁵⁸ to read images.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁹ or the [previous versions](#)⁶⁰ page to find documentation for the version you are using.

11.13 VisBio

VisBio⁶¹ is a biological visualization tool designed for easy visualization and analysis of multidimensional image data. VisBio uses Bio-Formats to import files as the Bio-Formats library originally grew out of our efforts to continually expand the file format support within VisBio.

11.13.1 Installation

VisBio is bundled with Bio-Formats, so no further installation is necessary.

⁴⁹http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/bioformats_package.jar

⁵⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/utis/mipav/PlugInBioFormatsImporter.java>

⁵¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/utis/mipav/readme.txt>

⁵²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

⁵³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁵<http://vaa3d.org>

⁵⁶<http://penglab.janelia.org/>

⁵⁷<http://www.hhmi.org/janelia/>

⁵⁸http://www.farsight-toolkit.org/wiki/FARSIGHT_Tutorials/Building_Software/Bio-Formats/Building_C%2B%2B_Bindings

⁵⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁶¹<http://loci.wisc.edu/software/visbio>

11.13.2 Upgrading

It should be possible to use a [newer version of Bio-Formats](#)⁶² by overwriting the old **bio-formats.jar** and optional libraries within the VisBio distribution. For Mac OS X, you'll have to control click the VisBio program icon, choose "Show Package Contents" and navigate into Contents/Resources/Java to find the JAR files.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶³ or the [previous versions](#)⁶⁴ page to find documentation for the version you are using.

11.14 XuvTools

XuvTools⁶⁵ is automated 3D stitching software for biomedical image data. As of release 1.8.0, XuvTools uses Bio-Formats to read image data.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁶ or the [previous versions](#)⁶⁷ page to find documentation for the version you are using.

⁶²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

⁶³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁵<http://www.xuvtools.org>

⁶⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁷<http://www.openmicroscopy.org/site/support/legacy/>

Part III

Developer Documentation

The following sections describe various things that are useful to know when working with Bio-Formats. It is recommended that you obtain the Bio-Formats source by following the directions in the [Source code](#) section. Referring to the [Javadocs](#)⁶⁸ as you read over these pages should help, as the notes will make more sense when you see the API.

For a complete list of supported formats, see the Bio-Formats [supported formats table](#).

For a few working examples of how to use Bio-Formats, see [these Github pages](#)⁶⁹.

⁶⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/>

⁶⁹<https://github.com/openmicroscopy/bioformats/tree/develop/components/formats-gpl/utis>

INTRODUCTION TO BIO-FORMATS

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](http://www.openmicroscopy.org/site/support/bio-formats5.0/) or the [previous versions²](http://www.openmicroscopy.org/site/support/legacy/) page to find documentation for the version you are using.

12.1 Overview for developers

From the rest of the Bio-Formats developer documentation one may piece together a correct and useful understanding of what Bio-Formats does and how it does it. This section gives a high-level tour of these technical details, for those new to working on Bio-Formats itself, making it easier to understand how the information from the other sections fits into the big picture.

12.1.1 Terms and concepts

Bio-Formats can read image data from files for many formats, and can write image data to files for some formats. An image may have many two-dimensional “planes” of pixel intensity values. Each pixel on a plane is identified by its x , y values. Planes within an image may be identified by various dimensions including z (third spatial dimension), c (channel, e.g. wavelength) or t (time). Planes may be divided into tiles, which are rectangular subsections of a plane; this is helpful in handling very large planes. A file (or set of related files) on disk may contain multiple images: each image is identified by a unique *series* number.

An image is more than a set of planes: it also has metadata. Bio-Formats distinguishes *core metadata*, such as the x , y , z , c , t dimensions of the image, from format-specific *original metadata*, e.g. information about the microscope and its settings, which is represented as a dictionary of values indexed by unique keys. Metadata apply to the image data as a whole, or separately to specific series within it.

Bio-Formats is able to translate the above metadata into a further form, *OME metadata*. The translation may be partial or incomplete, but remains very useful for allowing the metadata of images from different file formats to be used and compared in a common format defined by the OME data model.

12.1.2 Implementation

Bio-Formats is primarily a Java project. It can be used from MATLAB, and there are C++ bindings and an ongoing C++ implementation effort. The source code is available for download and sometimes the user community contributes code back into Bio-Formats by opening a pull request on GitHub. Bio-Formats is built from source with Ant or Maven and some of the Bio-Formats source code is generated from other files during the build process. The resulting JARs corresponding to official Bio-Formats releases are available for download.

Readers and writers for different image file formats are implemented in separate Java classes. Readers for related formats may reflect that relationship in the Java class hierarchy. Simple standalone command-line tools are provided with Bio-Formats, but it is more commonly used as a third-party library by other applications. Various examples show how one may use Bio-Formats in different ways in writing a new application that reads or writes image data. A common pattern is to initialize a reader based on the image data’s primary file, then query that reader for the metadata and planes of interest.

The set of readers is easily modified. The [readers.txt³](https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-api/src/loci/formats/readers.txt) file lists the readers to try in determining an image file’s format, and there are many useful classes and methods among the Bio-Formats Java code to assist in writing new readers and writers.

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-api/src/loci/formats/readers.txt>

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴](#) or the [previous versions⁵](#) page to find documentation for the version you are using.

12.2 Obtaining and building Bio-Formats

12.2.1 Source code

The source code for this Bio-Formats release is available from the [download page⁶](#). This release and the latest Bio-Formats source code are also available from the Git repository. This may be accessed using the repository path:

```
git@github.com:openmicroscopy/bioformats.git
```

More information about Git and client downloads are available from the [Git project website⁷](#). You can also browse the [Bio-Formats source on GitHub⁸](#)

Note: Windows users must set git to use `core.autocrlf=input` to ensure that Bio-Formats uses LF rather than CRLF line endings, otherwise the build will fail (Genshi can't process code templates with CRLF line endings, leading to broken sources being generated). This can be set globally in the registry when installing **msysgit** or by editing `etc/gitconfig` in the git installation directory. Annoyingly, these settings appear to override per-user and per-repository configuration values, requiring these to be set globally.

Lastly, you can browse the [Bio-Formats Javadocs online⁹](#), or generate them yourself using the “docs” Ant target.

12.2.2 Source code structure

The Bio-Formats code is divided into several projects. Core components are located in subfolders of the [components¹⁰](#) folder, with some components further classified into [components/forks¹¹](#) or [components/stubs¹²](#), depending on the nature of the project. See the [Component overview](#) for more information, including associated build targets for each component.

Each project has a corresponding Maven POM file, which can be used to work with the project in your favorite IDE, or from the command line, once you have cloned the source.

12.2.3 Building from source

Instructions for several popular options follow. In all cases, make sure that the prerequisites are installed before you begin.

If you are interested in working on the Bio-Formats source code itself, you can load it into your favorite IDE, or develop with your favorite text editor.

Prerequisites

In addition to the Bio-Formats source code, the following programs and packages are also required:

- [Python 2¹³](#), version 2.6 or later (note: not version 3)
- [Genshi¹⁴](#) 0.5 or later (0.7 recommended)

⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/>

⁷<http://git-scm.com/>

⁸<https://github.com/openmicroscopy/bioformats>

⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/>

¹⁰<https://github.com/openmicroscopy/bioformats/tree/develop/components/>

¹¹<https://github.com/openmicroscopy/bioformats/tree/develop/components/forks/>

¹²<https://github.com/openmicroscopy/bioformats/tree/develop/components/stubs/>

¹³<http://python.org>

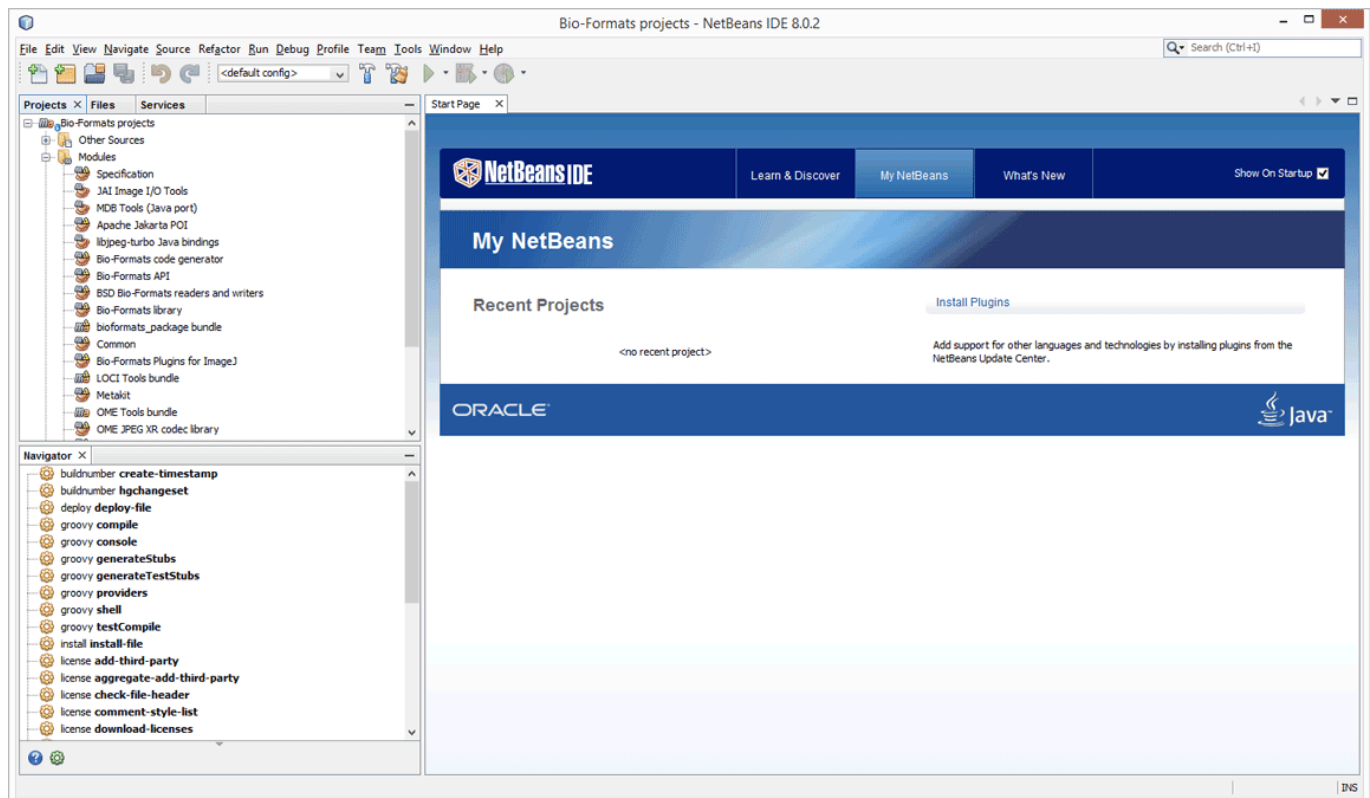
¹⁴<http://genshi.edgewall.org>

Note: Genshi may be installed (in order of decreasing preference) with some Linux distributions' package managers, **pip** (`pip install genshi`), by downloading a compatible `.egg` for your system from the [Genshi download page](http://genshi.edgewall.org/wiki/Download)¹⁵, or from source. If using a `.egg`, make sure it is added to your `PYTHONPATH` environment variable.

NetBeans

NetBeans comes with Maven support built in. To import the Bio-Formats source, perform the following steps:

1. Select *File* → *Open Project* from the menu - choose the top-level path to `bioformats.git` and click *Open Project*
2. In the 'Projects' tab on the left-hand side, expand the 'Bio-Formats projects' entry - you should now have a series of folders including 'Other Sources', 'Modules' and 'Dependencies'.
3. Expand the 'Modules' folder to give a list of components and then double-click the desired project(s) to work with them.



Alternately, you can clone the source directly from NetBeans into a project by selecting *Team* → *Git* → *Clone Other...* from the menu.

Eclipse

Eclipse uses the “Maven Integration for Eclipse” (m2e) plugin to work with Maven projects. It is more flexible than Eclipse’s built-in project management because m2e transparently converts between project dependencies and JAR dependencies (stored in the Maven repository in `~/ .m2/repository`) on the build path, depending on which projects are currently open.

We recommend using Eclipse 4.3 (Kepler), specifically - “Eclipse IDE for Java developers”. It comes with m2e installed (<http://eclipse.org/downloads/compare.php?release=kepler>).

You can then import the Bio-Formats source by choosing *File* → *Import* → *Existing Maven Projects* from the menu and browsing to the top-level folder of your Bio-Formats working copy. Alternatively, run the Eclipse Maven target with `mvn eclipse:eclipse` to create the Eclipse project files, then use *File* → *Import* → *Existing Projects into Workspace*.

To remove post-import errors, either close the `ome-xml` project or run:

¹⁵<http://genshi.edgewall.org/wiki/Download>

```
ant jars && mvn generate-sources
```

See also:

[ome-devel] Importing source into eclipse¹⁶

Command line

If you prefer developing code with a text editor such as vim or emacs, you can use the Ant or Maven command line tools to compile Bio-Formats. The Bio-Formats source tree provides parallel build systems for both Ant and Maven, so you can use either one to build the code.

For a list of Ant targets, run:

```
ant -p
```

In general, `ant jars` or `ant tools` is the correct command.

When using Maven, Bio-Formats is configured to run the “install” target by default, so all JARs will be copied into your local Maven repository in `~/.m2/repository`. Simply run:

```
mvn
```

With either Ant or Maven, you can use similar commands in any subproject folder to build just that component.

12.2.4 Using Gradle, Maven or Ivy

All released `.jar` artifacts may be obtained through the OME [Artifactory server](#)¹⁷. The “Client Settings” section of the Artifactory main page provides example code snippets for inclusion into your Gradle, Maven or Ivy project, which will enable the use of this repository.

Example snippets for using the Bio-Formats 5.1-SNAPSHOT `formats-gpl` artifact are available for Gradle and for Maven. These may be copied into your project to enable the use of the Bio-Formats library components, and may be adjusted to use different components or different release or development versions of Bio-Formats.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁸ or the [previous versions](#)¹⁹ page to find documentation for the version you are using.

12.3 Component overview

The Bio-Formats code repository is divided up into separate components.

The Ant targets to build each component from the repository root are noted in the component descriptions below. Unless otherwise noted, each component can also be built with Maven by running `mvn` in the component’s subdirectory. The Maven module name for each component (as it is shown in most IDEs) is also noted in parenthesis.

12.3.1 Core components

The most commonly used and actively modified components.

- *formats-common*

¹⁶<http://lists.openmicroscopy.org.uk/pipermail/ome-devel/2014-March/002719.html>

¹⁷<http://artifacts.openmicroscopy.org/artifactory>

¹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹<http://www.openmicroscopy.org/site/support/legacy/>

- *formats-api*
- *formats-bsd*
- *formats-gpl*
- *specification*
- *ome-xml*

12.3.2 Internal testing components

These components are used heavily during continuous integration testing, but are less relevant for active development work.

- *autogen*
- *test-suite*

12.3.3 Forks of existing projects

- *mdbtools*
- *jai*
- *turbojpeg*
- *poi*

12.3.4 All components

autogen (Bio-Formats code generator)²⁰:

Ant: jar-autogen

Contains everything needed to automatically generate documentation for supported file formats. *format-pages.txt*²¹ should be updated for each new file format reader or writer, but otherwise manual changes should be unnecessary. The following Ant targets are used to regenerate the documentation for all formats:

```
gen-format-pages
gen-meta-support
gen-original-meta-support
```

bio-formats-plugins (Bio-Formats Plugins for ImageJ)²²:

Ant: jar-bio-formats-plugins

Everything pertaining to the Bio-Formats plugins for ImageJ lives in this component. Note that when built, this component produces *bio-formats_plugins.jar* (instead of *bio-formats-plugins.jar*) to be in keeping with ImageJ plugin naming conventions. *bio-formats-tools* (Bio-Formats command line tools)²³:

Ant: jar-bio-formats-tools

The classes that implement the **showinf**, **bfconvert**, and **mkfake** *command line tools* are contained in this component. Note that this is built with the **jar-bio-formats-tools** Ant target, and not the **tools** target (which is the Ant equivalent of *bundles*). *bundles* (bioformats_package bundle, LOCI Tools bundle, OME Tools bundle)²⁴:

Ant: tools

This is only needed by the Maven build system, and is used to aggregate all of the individual .jar files into *bioformats_package.jar*. There should not be any code here, just build system files. *forks/jai* (JAI Image I/O Tools)²⁵:

²⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/autogen>

²¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/autogen/src/format-pages.txt>

²²<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins>

²³<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-tools>

²⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/bundles>

²⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/forks/jai>

Ant: jar-jai

This is a fork of [JAI ImageIO](#)²⁶ which adds support for decoding YCbCr JPEG-2000 data. This is primarily needed for reading images from histology/pathology formats in *formats-gpl*. There are no dependencies on other components. [forks/mdbtools \(MDB Tools \(Java port\)\)](#)²⁷:

Ant: jar-mdbtools

This is a fork of the [mdbtools-java](#)²⁸ project. There are numerous bug fixes, as well as changes to reduce the memory required for large files. There are no dependencies on other components. [forks/poi \(Apache Jakarta POI\)](#)²⁹:

Ant: jar-ome-poi

This is a fork of [Apache POI](#)³⁰, which allows reading of Microsoft OLE document files. We have made substantial changes to support files larger than 2GB and reduce the amount of memory required to open a file. I/O is also handled by classes from *formats-common*, which allows OLE files to be read from memory. [forks/turbojpeg \(libjpeg-turbo Java bindings\)](#)³¹:

Ant: jar-turbojpeg

This is a fork of [libjpeg-turbo](#)³². There are not any real code changes, but having this as a separate component allows us to package the libjpeg-turbo Java API together with all of the required binaries into a single .jar file using [native-lib-loader](#)³³. There are no dependencies on other components. [formats-api \(Bio-Formats API\)](#)³⁴:

Ant: jar-formats-api

This defines all of the high level interfaces and abstract classes for reading and writing files. There are no file format readers or writers actually implemented in this component, but it does contain the majority of the API that defines Bio-Formats. *formats-bsd* and *formats-gpl* implement this API to provide file format readers and writers. *formats-common* and *ome-xml* are both required as part of the interface definitions. [formats-common \(Common\)](#)³⁵:

Ant: jar-formats-common

Provides I/O classes that unify reading from files on disk, streams or files in memory, compressed streams, and non-file URLs. The primary entry points are [Location](#)³⁶, [RandomAccessInputStream](#)³⁷ (for reading), and [RandomAccessOutputStream](#)³⁸ (for writing).

In addition to I/O, there are several classes to assist in working with XML ([XMLTools](#)³⁹), date/timestamps ([DateTools](#)⁴⁰), logging configuration ([DebugTools](#)⁴¹), and byte arithmetic ([DataTools](#)⁴²).

This does not depend on any other components, so can be used anywhere independent of the rest of the Bio-Formats API. [formats-bsd \(BSD Bio-Formats readers and writers\)](#)⁴³:

Ant: jar-formats-bsd, jar-formats-bsd-tests

This contains readers and writers for formats which have a publicly available specification, e.g. TIFF. Everything in the component is BSD-licensed. [formats-gpl \(Bio-Formats library\)](#)⁴⁴:

Ant: jar-formats-gpl

The majority of the file format readers and some file format writers are contained in this component. Everything in the component is GPL-licensed (in contrast with *formats-bsd*). Most file formats represented in this component do not have a publicly available specification. [metakit \(Metakit\)](#)⁴⁵:

²⁶<http://java.net/projects/jai-imageio-core>

²⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/forks/mdbtools>

²⁸<http://mdbtools.cvs.sourceforge.net/viewvc/mdbtools/mdbtools-java>

²⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/forks/poi>

³⁰<http://poi.apache.org>

³¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/forks/turbojpeg>

³²<http://libjpeg-turbo.virtualgl.org/>

³³<http://github.com/scijava/native-lib-loader>

³⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-api>

³⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-common>

³⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/Location.html>

³⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/RandomAccessInputStream.html>

³⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/RandomAccessOutputStream.html>

³⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/xml/XMLTools.html>

⁴⁰<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/DateTools.html>

⁴¹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/DebugTools.html>

⁴²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/DataTools.html>

⁴³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd>

⁴⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl>

⁴⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/metakit>

Ant: jar-metakit

Java implementation of the [Metakit database specification](#)⁴⁶. This uses classes from *formats-common* and is used by *formats-gpl*, but is otherwise independent of the main Bio-Formats API. *ome-jxr* (OME JPEG XR codec library)⁴⁷:

Ant: jar-ome-jxr

Experimental implementation of [JPEG-XR](#)⁴⁸ in Java. This uses classes from *formats-common*, but is otherwise independent of Bio-Formats. *ome-xml* (OME-XML Java library)⁴⁹:

Ant: jar-ome-xml

This component contains classes that represent the OME-XML schema. Some classes are committed to the Git repository, but the majority are generated at build time by using *xsd-fu* to parse the *OME-XML schema files*. Classes from this component are used by Bio-Formats to read and write OME-XML, but they can also be used independently. [specification \(Specification\)](#)⁵⁰:

Ant: jar-specification

All released and in-progress OME-XML schema files are contained in this component. The specification component is also the location of all XSLT stylesheets for converting between OME-XML schema versions, as well as example OME-XML files in each of the released schema versions. *stubs* (Luratech LuraWave stubs, MIPAV stubs)⁵¹:

Ant: jar-lwf-stubs, jar-mipav-stubs

This component provides empty classes that mirror third-party dependencies which are required at compile time but cannot be included in the build system (usually due to licensing issues). The build succeeds since required class names are present with the correct method signatures; the end user is then expected to replace the stub .jar files at runtime. *test-suite* (Bio-Formats testing framework)⁵²:

Ant: jar-tests

All tests that operate on files from our data repository (i.e. integration tests) are included in this component. These tests are primarily run by the [continuous integration jobs](#)⁵³, and verify that there are no regressions in reading images or metadata. *xsd-fu* (XSD-FU)⁵⁴:

Ant: no target

xsd-fu is a Python framework for turning the schema files in the *specification* component into the classes that represent the OME-XML schema in the *ome-xml* component.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁵ or the [previous versions](#)⁵⁶ page to find documentation for the version you are using.

12.4 Reading files

12.4.1 Basic file reading

Bio-Formats provides several methods for retrieving data from files in an arbitrary (supported) format. These methods fall into three categories: raw pixels, core metadata, and format-specific metadata. All methods described here are present and documented in [loci.formats.IFormatReader](#)⁵⁷. In general, it is recommended that you read files using an instance of [loci.formats.ImageReader](#)⁵⁸. While it is possible to work with readers for a specific format, ImageReader contains additional logic to automatically detect the format of a file and delegate subsequent calls to the appropriate reader.

⁴⁶<http://equi4.com/metakit/>

⁴⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/ome-jxr>

⁴⁸http://en.wikipedia.org/wiki/JPEG_XR

⁴⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/ome-xml>

⁵⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/specification>

⁵¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/stubs>

⁵²<https://github.com/openmicroscopy/bioformats/blob/develop/components/test-suite>

⁵³<http://www.openmicroscopy.org/site/support/contributing/ci-bio-formats.html>

⁵⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/xsd-fu>

⁵⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html>

⁵⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ImageReader.html>

Prior to retrieving pixels or metadata, it is necessary to call `setId(java.lang.String)`⁵⁹ on the reader instance, passing in the name of the file to read. Some formats allow multiple series (5D image stacks) per file; in this case you may wish to call `setSeries(int)`⁶⁰ to change which series is being read.

Raw pixels are always retrieved one plane at a time. Planes are returned as raw byte arrays, using one of the `openBytes` methods.

Core metadata is the general term for anything that might be needed to work with the planes in a file. A list of core metadata fields is given in the table below together with the appropriate accessor method:

Core metadata field	API method
image width	<code>getSizeX()</code> ⁷⁴
image height	<code>getSizeY()</code> ⁷⁵
number of series per file	<code>getSeriesCount()</code> ⁷⁶
total number of images per series	<code>getImageCount()</code> ⁷⁷
number of slices in the current series	<code>getSizeZ()</code> ⁷⁸
number of timepoints in the current series	<code>getSizeT()</code> ⁷⁹
number of actual channels in the current series	<code>getSizeC()</code> ⁸⁰
number of channels per image	<code>getRGBChannelCount()</code> ⁸¹
the ordering of the images within the current series	<code>getDimensionOrder()</code> ⁸²
whether each image is RGB	<code>isRGB()</code> ⁸³
whether the pixel bytes are in little-endian order	<code>isLittleEndian()</code> ⁸⁴
whether the channels in an image are interleaved	<code>isInterleaved()</code> ⁸⁵
the type of pixel data in this file	<code>getPixelType()</code> ⁸⁶

All file formats are guaranteed to accurately report core metadata.

Format-specific metadata refers to any other data specified in the file - this includes acquisition and hardware parameters, among other things. This data is stored internally in a **java.util.Hashtable**, and can be accessed in one of two ways: individual values can be retrieved by calling `getMetadataValue(java.lang.String)`⁸⁷, which gets the value of the specified key. Note that the keys in this Hashtable are different for each format, hence the name “format-specific metadata”.

See *Bio-Formats metadata processing* for more information on the metadata capabilities that Bio-Formats provides.

See also:

IFormatReader⁸⁸ Source code of the `loci.formats.IFormatReader` interface

⁵⁹[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatHandler.html#setId\(java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatHandler.html#setId(java.lang.String))

⁶⁰[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#setSeries\(int\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#setSeries(int))

⁶¹[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeX\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeX())

⁶²[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeY\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeY())

⁶³[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSeriesCount\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSeriesCount())

⁶⁴[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getImageCount\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getImageCount())

⁶⁵[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeZ\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeZ())

⁶⁶[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeT\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeT())

⁶⁷[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeC\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeC())

⁶⁸[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getRGBChannelCount\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getRGBChannelCount())

⁶⁹[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getDimensionOrder\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getDimensionOrder())

⁷⁰[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isRGB\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isRGB())

⁷¹[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isLittleEndian\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isLittleEndian())

⁷²[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isInterleaved\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isInterleaved())

⁷³[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getPixelType\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getPixelType())

⁷⁴[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeX\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeX())

⁷⁵[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeY\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeY())

⁷⁶[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSeriesCount\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSeriesCount())

⁷⁷[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getImageCount\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getImageCount())

⁷⁸[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeZ\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeZ())

⁷⁹[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeT\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeT())

⁸⁰[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeC\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSizeC())

⁸¹[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getRGBChannelCount\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getRGBChannelCount())

⁸²[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getDimensionOrder\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getDimensionOrder())

⁸³[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isRGB\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isRGB())

⁸⁴[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isLittleEndian\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isLittleEndian())

⁸⁵[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isInterleaved\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isInterleaved())

⁸⁶[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getPixelType\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getPixelType())

⁸⁷[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getMetadataValue\(java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getMetadataValue(java.lang.String))

12.4.2 File reading extras

The previous section described how to read pixels as they are stored in the file. However, the native format is not necessarily convenient, so Bio-Formats provides a few extras to make file reading more flexible.

- The `loci.formats.ReaderWrapper`⁸⁹ API that implements `loci.formats.IFormatReader` allows to define “wrapper” readers that take a reader in the constructor, and manipulate the results somehow, for convenience. Using them is similar to the `java.io.InputStream/OutputStream` model: just layer whichever functionality you need by nesting the wrappers.

The table below summarizes a few wrapper readers of interest:

Wrapper reader	Functionality
<code>loci.formats.BufferedImageReader</code> ⁹⁸	Allows pixel data to be returned as <code>BufferedImage</code> s instead of raw byte arrays
<code>loci.formats.FileStitcher</code> ⁹⁹	Uses advanced pattern matching heuristics to group files that belong to the same dataset
<code>loci.formats.ChannelSeparator</code> ¹⁰⁰	Makes sure that all planes are grayscale - RGB images are split into 3 separate grayscale images
<code>loci.formats.ChannelMerger</code> ¹⁰¹	Merges grayscale images to RGB if the number of channels is greater than 1
<code>loci.formats.ChannelFiller</code> ¹⁰²	Converts indexed color images to RGB images
<code>loci.formats.MinMaxCalculator</code> ¹⁰³	Provides an API for retrieving the minimum and maximum pixel values for each channel
<code>loci.formats.DimensionSwapper</code> ¹⁰⁴	Provides an API for changing the dimension order of a file
<code>loci.formats.Memoizer</code> ¹⁰⁵	Caches the state of the reader into a memoization file

- `loci.formats.ImageTools`¹⁰⁶ and `loci.formats.gui.AWTImageTools`¹⁰⁷ provide a number of methods for manipulating `BufferedImage`s and primitive type arrays. In particular, there are methods to split and merge channels in a `BufferedImage/array`, as well as converting to a specific data type (e.g. convert short data to byte data).

12.4.3 Troubleshooting

- Importing multi-file formats (Leica LEI, PerkinElmer, FV1000 OIF, ICS, and Prairie TIFF, to name a few) can fail if any of the files are renamed. There are “best guess” heuristics in these readers, but they are not guaranteed to work in general. So please do not rename files in these formats.
- If you are working on a Macintosh, make sure that the data and resource forks of your image files are stored together. Bio-Formats does not handle separated forks (the native QuickTime reader tries, but usually fails).
- Bio-Formats file readers are not thread-safe. If files are read within a parallelized environment, a new reader must be fully initialized in each parallel session. See *Improving reading performance* about ways to improve file reading performance in multi-threaded mode.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁰⁸ or the [previous versions](#)¹⁰⁹ page to find documentation for the version you are using.

⁸⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ReaderWrapper.html>

⁹⁰<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/gui/BufferedImageReader.html>

⁹¹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FileStitcher.html>

⁹²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ChannelSeparator.html>

⁹³<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ChannelMerger.html>

⁹⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ChannelFiller.html>

⁹⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/MinMaxCalculator.html>

⁹⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/DimensionSwapper.html>

⁹⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html>

⁹⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/gui/BufferedImageReader.html>

⁹⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FileStitcher.html>

¹⁰⁰<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ChannelSeparator.html>

¹⁰¹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ChannelMerger.html>

¹⁰²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ChannelFiller.html>

¹⁰³<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/MinMaxCalculator.html>

¹⁰⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/DimensionSwapper.html>

¹⁰⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html>

¹⁰⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ImageTools.html>

¹⁰⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/gui/AWTImageTools.html>

¹⁰⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰⁹<http://www.openmicroscopy.org/site/support/legacy/>

12.5 Writing files

The `loci.formats.IFormatWriter`¹¹⁰ API is very similar to the reader API, in that files are written one plane at time (rather than all at once).

The file formats which can be written using Bio-Formats are marked in the *supported formats table* with a green tick in the ‘export’ column. These include, but are not limited to:

- TIFF (uncompressed, LZW, JPEG, or JPEG-2000)
- OME-TIFF (uncompressed, LZW, JPEG, or JPEG-2000)
- JPEG
- PNG
- AVI (uncompressed)
- QuickTime (uncompressed is supported natively; additional codecs use QTJava)
- Encapsulated PostScript (EPS)
- OME-XML (not recommended)

All writers allow the output file to be changed before the last plane has been written. This allows you to write to any number of output files using the same writer and output settings (compression, frames per second, etc.), and is especially useful for formats that do not support multiple images per file.

See also:

IFormatWriter¹¹¹ Source code of the `loci.formats.IFormatWriter` interface

loci.formats.tools.ImageConverter¹¹² Source code of the `loci.formats.tools.ImageConverter` class

Further details on exporting raw pixel data to OME-TIFF files Examples of OME-TIFF writing

¹¹⁰<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatWriter.html>

USING BIO-FORMATS AS A JAVA LIBRARY

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](#) or the [previous versions²](#) page to find documentation for the version you are using.

13.1 Using Bio-Formats as a Java library

If you wish to make use of Bio-Formats within your own software, you can [download formats-gpl.jar³](#) to use it as a library. Just add **formats-gpl.jar** to your CLASSPATH or build path. You will also need **common.jar** for common I/O functions, **ome-xml.jar** for metadata standardization, and **SLF4J⁴** for logging.

There are also certain packages that if present will be utilized to provide additional functionality. To include one, just place it in the same folder.

Package	Filename	License	Notes
Apache Jakarta POI ¹⁴	ome-poi.jar ¹⁵	Apache	OME fork; for OLE-based formats (zvi, oib, ipw, cxd)
MDB Tools ¹⁶	mdbtools-java.jar ¹⁷	LGPL	Java port, OME fork; for Olympus CellR and Zeiss LSM metadata (mdb)
JAI Image I/O Tools ¹⁸	jai_imageio.jar ¹⁹	BSD	Pure Java implementation, OME fork; for JPEG2000-based formats (nd2, jp2)
NetCDF ²⁰	netcdf-4.3.19.jar ²¹	LGPL	Java library; for HDF5-based formats (Imaris 5.5, MINC MRI)
QuickTime for Java ²²	QTJava.zip	Commercial	For additional QuickTime codecs

See the list in the [Bio-Formats toplevel build file²³](#) for a complete and up-to-date list of all optional libraries, which can all be found in our [Git repository²⁴](#).

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

³<http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/formats-gpl.jar>

⁴<http://slf4j.org/>

⁵<http://jakarta.apache.org/poi/>

⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/ome-poi.jar>

⁷<http://sourceforge.net/projects/mdbtools>

⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/mdbtools-java.jar>

⁹<http://java.net/projects/jai-imageio>

¹⁰http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/jai_imageio.jar

¹¹<http://www.unidata.ucar.edu/software/netcdf-java/>

¹²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/netcdf-4.3.19.jar>

¹³<http://www.apple.com/quicktime/download/standalone.html>

¹⁴<http://jakarta.apache.org/poi/>

¹⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/ome-poi.jar>

¹⁶<http://sourceforge.net/projects/mdbtools>

¹⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/mdbtools-java.jar>

¹⁸<http://java.net/projects/jai-imageio>

¹⁹http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/jai_imageio.jar

²⁰<http://www.unidata.ucar.edu/software/netcdf-java/>

²¹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/artifacts/netcdf-4.3.19.jar>

²²<http://www.apple.com/quicktime/download/standalone.html>

²³<https://github.com/openmicroscopy/bioformats/blob/develop/build.xml>

²⁴<https://github.com/openmicroscopy/bioformats/tree/develop/jar>

13.1.1 Examples of usage

MinimumWriter²⁵ - A command line utility demonstrating the minimum amount of metadata needed to write a file.

ImageConverter²⁶ - A simple command line tool for converting between formats.

ImageInfo²⁷ - A more involved command line utility for thoroughly reading an input file, printing some information about it, and displaying the pixels onscreen using the Bio-Formats viewer.

PrintTimestamps²⁸ - A command line example demonstrating how to extract timestamps from a file.

Simple_Read²⁹ - A simple ImageJ plugin demonstrating how to use Bio-Formats to read files into ImageJ (see *ImageJ overview*).

Read_Image³⁰ - An ImageJ plugin that uses Bio-Formats to build up an image stack, reading image planes one by one (see *ImageJ overview*).

Mass_Importer³¹ - A simple plugin for ImageJ that demonstrates how to open all image files in a directory using Bio-Formats, grouping files with similar names to avoiding opening the same dataset more than once (see *ImageJ overview*).

13.1.2 A Note on Java Web Start (**bioformats_package.jar** vs. **formats-gpl.jar**)

To use Bio-Formats with your Java Web Start application, we recommend using **formats-gpl.jar** rather than **bioformats_package.jar**—the latter is merely a bundle of **formats-gpl.jar** plus all its optional dependencies.

The **bioformats_package.jar** bundle is intended as a convenience (e.g. to simplify installation as an ImageJ plugin), but is by no means the only solution for developers. We recommend using **formats-gpl.jar** as a separate entity depending on your needs as a developer.

The bundle is quite large because we have added support for several formats that need large helper libraries (e.g. Imaris' HDF-based format). However, these additional libraries are optional; Bio-Formats has been coded using reflection so that it can both compile and run without them.

When deploying a JNLP-based application, using **bioformats_package.jar** directly is not the best approach, since every time Bio-Formats is updated, the server would need to feed another 15+ MB JAR file to the client. Rather, Web Start is a case where you should keep the JARs separate, since JNLP was designed to make management of JAR dependencies trivial for the end user. By keeping **formats-gpl.jar** and the optional dependencies separate, only a <1 MB JAR needs to be updated when **formats-gpl.jar** changes.

As a developer, you have the option of packaging **formats-gpl.jar** with as many or as few optional libraries as you wish, to cut down on file size as needed. You are free to make whatever kind of “stripped down” version you require. You could even build a custom **formats-gpl.jar** that excludes certain classes, if you like.

For an explicit enumeration of all the optional libraries included in **bioformats_package.jar**, see the `package.libraries` variable of the `ant/toplevel.properties`³² file of the distribution. You can also read our notes about each in the source distribution's `Ant build.xml`³³ script.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁴ or the [previous versions](#)³⁵ page to find documentation for the version you are using.

13.2 Exporting files using Bio-Formats

This guide pertains to version 4.2 and later.

²⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/utlils/MinimumWriter.java>

²⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-tools/src/loci/formats/tools/ImageConverter.java>

²⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-tools/src/loci/formats/tools/ImageInfo.java>

²⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/utlils/PrintTimestamps.java>

²⁹https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utlils/Simple_Read.java

³⁰https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utlils/Read_Image.java

³¹https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utlils/Mass_Importer.java

³²<https://github.com/openmicroscopy/bioformats/blob/develop/ant/toplevel.properties>

³³<https://github.com/openmicroscopy/bioformats/blob/develop/build.xml#L240>

³⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵<http://www.openmicroscopy.org/site/support/legacy/>

13.2.1 Basic conversion

The first thing we need to do is set up a reader:

```
// create a reader that will automatically handle any supported format
IFormatReader reader = new ImageReader();
// tell the reader where to store the metadata from the dataset
MetadataStore metadata;

try {
    ServiceFactory factory = new ServiceFactory();
    OMEXMLService service = factory.getInstance(OMEXMLService.class);
    metadata = service.createOMEXMLMetadata();
}
catch (DependencyException exc) {
    throw new FormatException("Could not create OME-XML store.", exc);
}
catch (ServiceException exc) {
    throw new FormatException("Could not create OME-XML store.", exc);
}

reader.setMetadataStore(metadata);
// initialize the dataset
reader.setId("/path/to/file");
```

Now, we set up our writer:

```
// create a writer that will automatically handle any supported output format
IFormatWriter writer = new ImageWriter();
// give the writer a MetadataRetrieve object, which encapsulates all of the
// dimension information for the dataset (among many other things)
writer.setMetadataRetrieve(MetadataTools.asRetrieve(reader.getMetadataStore()));
// initialize the writer
writer.setId("/path/to/output/file");
```

Note that the extension of the file name passed to ‘writer.setId(...)’ determines the file format of the exported file.

Now that everything is set up, we can start writing planes:

```
for (int series=0; series<reader.getSeriesCount(); series++) {
    reader.setSeries(series);
    writer.setSeries(series);

    for (int image=0; image<reader.getImageCount(); image++) {
        writer.saveBytes(image, reader.openBytes(image));
    }
}
```

Finally, make sure to close both the reader and the writer. Failure to do so can cause:

- file handle leaks
- memory leaks
- truncated output files

Fortunately, closing the files is very easy:

```
reader.close();
writer.close();
```

13.2.2 Converting large images

The flaw in the previous example is that it requires an image plane to be fully read into memory before it can be saved. In many cases this is fine, but if you are working with very large images (especially > 4 GB) this is problematic. The solution is to break each image plane into a set of reasonably-sized tiles and save each tile separately - thus substantially reducing the amount of memory required for conversion.

For now, we'll assume that your tile size is 1024 x 1024, though in practice you will likely want to adjust this. Assuming you have an `IFormatReader` and `IFormatWriter` set up as in the previous example, let's start writing planes:

```
int tileWidth = 1024;
int tileHeight = 1024;

for (int series=0; series<reader.getSeriesCount(); series++) {
    reader.setSeries(series);
    writer.setSeries(series);

    // determine how many tiles are in each image plane
    // for simplicity, we'll assume that the image width and height are
    // multiples of 1024

    int tileRows = reader.getSizeY() / tileHeight;
    int tileColumns = reader.getSizeX() / tileWidth;

    for (int image=0; image<reader.getImageCount(); image++) {
        for (int row=0; row<tileRows; row++) {
            for (int col=0; col<tileColumns; col++) {
                // open a tile - in addition to the image index, we need to specify
                // the (x, y) coordinate of the upper left corner of the tile,
                // along with the width and height of the tile

                int xCoordinate = col * tileWidth;
                int yCoordinate = row * tileHeight;
                byte[] tile =
                    reader.openBytes(image, xCoordinate, yCoordinate, tileWidth, tileHeight);
                writer.saveBytes(
                    image, tile, xCoordinate, yCoordinate, tileWidth, tileHeight);
            }
        }
    }
}
```

As noted, the example assumes that the width and height of the image are multiples of the tile dimensions. Be careful, as this is not always the case; the last column and/or row may be smaller than preceding columns/rows. An exception will be thrown if you attempt to read or write a tile that is not completely contained by the original image plane. Most writers perform best if the tile width is equal to the image width, although specifying any valid width should work.

As before, you need to close the reader and writer.

13.2.3 Converting to multiple files

The recommended method of converting to multiple files is to use a single `IFormatWriter`, like so:

```
// you should have set up a reader as in the first example
ImageWriter writer = new ImageWriter();
writer.setMetadataRetrieve(MetadataTools.asRetrieve(reader.getMetadataStore()));
// replace this with your own filename definitions
// in this example, we're going to write half of the planes to one file
// and half of the planes to another file
String[] outputFiles =
    new String[] { "/path/to/file/1.tiff", "/path/to/file/2.tiff" };
writer.setId(outputFiles[0]);
```

```
int planesPerFile = reader.getImageCount() / outputFiles.length;
for (int file=0; file<outputFiles.length; file++) {
    writer.changeOutputFile(outputFiles[file]);
    for (int image=0; image<planesPerFile; image++) {
        int index = file * planesPerFile + image;
        writer.saveBytes(image, reader.openBytes(index));
    }
}

reader.close();
writer.close();
```

The advantage here is that the relationship between the files is preserved when converting to formats that support multi-file datasets internally (namely OME-TIFF). If you are only converting to graphics formats (e.g. JPEG, AVI, MOV), then you could also use a separate `IFormatWriter` for each file, like this:

```
// again, you should have set up a reader already
String[] outputFiles = new String[] { "/path/to/file/1.avi", "/path/to/file/2.avi" };
int planesPerFile = reader.getImageCount() / outputFiles.length;
for (int file=0; file<outputFiles.length; file++) {
    ImageWriter writer = new ImageWriter();
    writer.setMetadataRetrieve(MetadataTools.asRetrieve(reader.getMetadataStore()));
    writer.setId(outputFiles[file]);
    for (int image=0; image<planesPerFile; image++) {
        int index = file * planesPerFile + image;
        writer.saveBytes(image, reader.openBytes(index));
    }
    writer.close();
}
```

13.2.4 Known issues

List of Trac tickets³⁶

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁷ or the [previous versions](#)³⁸ page to find documentation for the version you are using.

13.3 Further details on exporting raw pixel data to OME-TIFF files

This document explains how to export pixel data to OME-TIFF using Bio-Formats version 4.2 and later.

The first thing that must happen is we must create the object that stores OME-XML metadata. This is done as follows:

```
ServiceFactory factory = new ServiceFactory();
OMEXMLService service = factory.getInstance(OMEXMLService.class);
IMetadata omexml = service.createOMEXMLMetadata();
```

The ‘omexml’ object can now be used in our code to store OME-XML metadata, and by the file format writer to retrieve OME-XML metadata.

Now that we have somewhere to put metadata, we need to populate as much metadata as we can. The minimum amount of metadata required is:

³⁶<http://trac.openmicroscopy.org.uk/ome/query?status=accepted&status=new&status=reopened&keywords=Formats&col=id&col=summary&col=status&col=type&col=priority&col=milestone&col=component&order=priority>

[export&component=Bio-](#)

³⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁸<http://www.openmicroscopy.org/site/support/legacy/>

- endianness of the pixel data
- the order in which dimensions are stored
- the bit depth of the pixel data
- the number of channels
- the number of timepoints
- the number of Z sections
- the width (in pixels) of an image
- the height (in pixels) of an image
- the number of samples per channel (3 for RGB images, 1 otherwise)

We populate that metadata as follows:

```
omexml.setImageID("Image:0", 0);
omexml.setPixelsID("Pixels:0", 0);

// specify that the pixel data is stored in big-endian order
// replace 'TRUE' with 'FALSE' to specify little-endian order
omexml.setPixelsBinDataBigEndian(Boolean.TRUE, 0, 0);

omexml.setPixelsDimensionOrder(DimensionOrder.XYZCT, 0);
omexml.setPixelsType(PixelType.UINT16, 0);
omexml.setPixelsSizeX(new PositiveInteger(width), 0);
omexml.setPixelsSizeY(new PositiveInteger(height), 0);
omexml.setPixelsSizeZ(new PositiveInteger(zSectionCount), 0);
omexml.setPixelsSizeC(new PositiveInteger(channelCount *
samplesPerChannel), 0);
omexml.setPixelsSizeT(new PositiveInteger(timepointCount), 0);

for (int channel=0; channel<channelCount; channel++) {
    omexml.setChannelID("Channel:0:" + channel, 0, channel);
    omexml.setChannelSamplesPerPixel(new PositiveInteger(samplesPerChannel),
0, channel);
}
```

There is much more metadata that can be stored; please see the Javadoc for `loci.formats.meta.MetadataStore` for a complete list.

Now that we have defined all of the metadata, we need to create a file writer:

```
ImageWriter writer = new ImageWriter();
```

Now we must associate the ‘omexml’ object with the file writer:

```
writer.setMetadataRetrieve(omexml);
```

The writer now knows to retrieve any metadata that it needs from ‘omexml’.

We now tell the writer which file it should write to:

```
writer.setId("output-file.ome.tiff");
```

It is critical that the file name given to the writer ends with “.ome.tiff” or “.ome.tif”, as it is the file name extension that determines which format will be written.

Now that everything is set up, we can save the image data. This is done plane by plane, and we assume that the pixel data is stored in a 2D byte array ‘pixelData’:

```

int sizeC = omexml.getPixelsSizeC(0).getValue();
int sizeZ = omexml.getPixelsSizeZ(0).getValue();
int sizeT = omexml.getPixelsSizeT(0).getValue();
int samplesPerChannel = omexml.getChannelSamplesPerPixel(0).getValue();
sizeC /= samplesPerChannel;

int imageCount = sizeC * sizeZ * sizeT;

for (int image=0; image<imageCount; image++) {
    writer.saveBytes(image, pixelData[image]);
}
}

```

Finally, we must tell the writer that we are finished, so that the output file can be properly closed:

```
writer.close();
```

There should now be a complete OME-TIFF file at whichever path was specified above.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](http://www.openmicroscopy.org/site/support/bio-formats5.0/)³⁹ or the [previous versions](http://www.openmicroscopy.org/site/support/legacy/)⁴⁰ page to find documentation for the version you are using.

13.4 Converting files from FV1000 OIB/OIF to OME-TIFF

This document explains how to convert a file from FV1000 OIB/OIF to OME-TIFF using Bio-Formats version 4.2 and later.

The first thing that must happen is we must create the object that stores OME-XML metadata. This is done as follows:

```

ServiceFactory factory = new ServiceFactory();
OMEXMLService service = factory.getInstance(OMEXMLService.class);
IMetadata omexml = service.createOMEXMLMetadata();

```

The ‘omexml’ object can now be used by both a file format reader and a file format writer for storing and retrieving OME-XML metadata.

Now that have somewhere to put metadata, we need to create a file reader and writer:

```

ImageReader reader = new ImageReader();
ImageWriter writer = new ImageWriter();

```

Now we must associate the ‘omexml’ object with the file reader and writer:

```

reader.setMetadataStore(omexml);
writer.setMetadataRetrieve(omexml);

```

The reader now knows to store all of the metadata that it parses into ‘omexml’, and the writer knows to retrieve any metadata that it needs from ‘omexml’.

We now tell the reader and writer which files will be read from and written to, respectively:

```

reader.setId("input-file.oib");
writer.setId("output-file.ome.tiff");

```

³⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰<http://www.openmicroscopy.org/site/support/legacy/>

It is critical that the file name given to the writer ends with ".ome.tiff" or ".ome.tif", as it is the file name extension that determines which format will be written.

Now that everything is set up, we can convert the image data. This is done plane by plane:

```
for (int series=0; series<reader.getSeriesCount(); series++) {
    reader.setSeries(series);
    writer.setSeries(series);

    byte[] plane = new byte[FormatTools.getPlaneSize(reader)];
    for (int image=0; image<reader.getImageCount(); image++) {
        reader.openBytes(image, plane);
        writer.saveBytes(image, plane);
    }
}
```

The body of the outer 'for' loop may also be replaced with the following:

```
reader.setSeries(series);
writer.setSeries(series);

for (int image=0; image<reader.getImageCount(); image++) {
    byte[] plane = reader.openBytes(image);
    writer.saveBytes(image, plane);
}
```

But note that this will be a little slower.

Finally, we must tell the reader and writer that we are finished, so that the input and output files can be properly closed:

```
reader.close();
writer.close();
```

There should now be a complete OME-TIFF file at whichever path was specified above.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴¹ or the [previous versions](#)⁴² page to find documentation for the version you are using.

13.5 Using Bio-Formats in MATLAB

This section assumes that you have installed the MATLAB toolbox as instructed in the [MATLAB user information page](#). Note the minimum supported MATLAB version is R2007b (7.5).

As described in [Using Java Libraries](#)⁴³, every installation of MATLAB includes a JVM allowing use of the Java API and third-party Java libraries. All the helper functions included in the MATLAB toolbox make use of the Bio-Formats Java API. Please refer to the [Javadocs](#)⁴⁴ for more information.

13.5.1 Increasing JVM memory settings

The default JVM settings in MATLAB can result in `java.lang.OutOfMemoryError: Java heap space` exceptions when opening large image files using Bio-Formats. Information about the Java heap space usage in MATLAB can be retrieved using:

⁴¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴²<http://www.openmicroscopy.org/site/support/legacy/>

⁴³http://uk.mathworks.com/help/matlab/matlab_external/product-overview.html

⁴⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/>

```
java.lang.Runtime.getRuntime.maxMemory
```

Default JVM settings can be increased by creating a `java.opts` file in the startup directory and overriding the default memory settings. We recommend using `-Xmx512m` in your `java.opts` file. Calling:

```
bfCheckJavaMemory()
```

will also throw a warning if the runtime memory is lower than the recommended value.

If errors of type `java.lang.OutOfMemoryError: PermGen space` are thrown while using Bio-Formats with the Java bundled with MATLAB (Java 6 or 7), you may try to increase the default values of `-XX:MaxPermSize` and `-XX:PermSize` via the `java.opts` file.

See also:

<http://www.mathworks.com/matlabcentral/answers/92813> How do I increase the heap space for the Java VM in MATLAB 6.0 (R12) and later versions?

[ome-users] Release of OMERO & Bio-Formats 5.1.1⁴⁵

13.5.2 Opening an image file

The first thing to do is initialize a file with the `bfopen`⁴⁶ function:

```
data = bfopen('/path/to/data/file');
```

This function returns an `n`-by-4 cell array, where `n` is the number of series in the dataset. If `s` is the series index between 1 and `n`:

- The `data{s, 1}` element is an `m`-by-2 cell array, where `m` is the number of planes in the `s`-th series. If `t` is the plane index between 1 and `m`:
 - The `data{s, 1}{t, 1}` element contains the pixel data for the `t`-th plane in the `s`-th series.
 - The `data{s, 1}{t, 2}` element contains the label for the `t`-th plane in the `s`-th series.
- The `data{s, 2}` element contains original metadata key/value pairs that apply to the `s`-th series.
- The `data{s, 3}` element contains color lookup tables for each plane in the `s`-th series.
- The `data{s, 4}` element contains a standardized OME metadata structure, which is the same regardless of the input file format, and contains common metadata values such as physical pixel sizes - see *OME metadata* below for examples.

Accessing planes

Here is an example of how to unwrap specific image planes for easy access:

```
seriesCount = size(data, 1);
series1 = data{1, 1};
series2 = data{2, 1};
series3 = data{3, 1};
metadataList = data{1, 2};
% etc
series1_planeCount = size(series1, 1);
series1_plane1 = series1{1, 1};
series1_label1 = series1{1, 2};
series1_plane2 = series1{2, 1};
series1_label2 = series1{2, 2};
```

⁴⁵<http://lists.openmicroscopy.org.uk/mailman/listinfo/ome-users/2015-April/005331.html>

⁴⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/bfopen.m>

```
series1_plane3 = series1{3, 1};
series1_label3 = series1{3, 2};
```

Displaying images

If you want to display one of the images, you can do so as follows:

```
series1_colorMaps = data{1, 3};
figure('Name', series1_label1);
if (isempty(series1_colorMaps{1}))
    colormap(gray);
else
    colormap(series1_colorMaps{1}(1, :));
end
imagesc(series1_plane1);
```

This will display the first image of the first series with its associated color map (if present). If you would prefer not to apply the color maps associated with each image, simply comment out the calls to `colormap`.

If you have the image processing toolbox, you could instead use:

```
imshow(series1_plane1, []);
```

You can also create an animated movie (assumes 8-bit unsigned data):

```
v = linspace(0, 1, 256)';
cmap = [v v v];
for p = 1 : size(series1, 1)
    M(p) = im2frame(uint8(series1{p, 1}), cmap);
end
if feature('ShowFigureWindows')
    movie(M);
end
```

Retrieving metadata

There are two kinds of metadata:

- **Original metadata** is a set of key/value pairs specific to the input format of the data. It is stored in the `data{s, 2}` element of the data structure returned by `bfopen`.
- **OME metadata** is a standardized metadata structure, which is the same regardless of input file format. It is stored in the `data{s, 4}` element of the data structure returned by `bfopen`, and contains common metadata values such as physical pixel sizes, instrument settings, and much more. See the [OME Model and Formats](http://www.openmicroscopy.org/site/support/ome-model/)⁴⁷ documentation for full details.

Original metadata

To retrieve the metadata value for specific keys:

```
% Query some metadata fields (keys are format-dependent)
metadata = data{1, 2};
subject = metadata.get('Subject');
title = metadata.get('Title');
```

⁴⁷<http://www.openmicroscopy.org/site/support/ome-model/>

To print out all of the metadata key/value pairs for the first series:

```
metadataKeys = metadata.keySet().iterator();
for i=1:metadata.size()
    key = metadataKeys.nextElement();
    value = metadata.get(key);
    fprintf('%s = %s\n', key, value)
end
```

OME metadata

Conversion of metadata to the OME standard is one of Bio-Formats' primary features. The OME metadata is always stored the same way, regardless of input file format.

To access physical voxel and stack sizes of the data:

```
omeMeta = data{1, 4};
stackSizeX = omeMeta.getPixelsSizeX(0).getValue(); % image width, pixels
stackSizeY = omeMeta.getPixelsSizeY(0).getValue(); % image height, pixels
stackSizeZ = omeMeta.getPixelsSizeZ(0).getValue(); % number of Z slices

voxelSizeXdefaultUnit = omeMeta.getPixelsPhysicalSizeX(0).unit().getSymbol(); % returns the default unit
voxelSizeXdefaultUnit = omeMeta.getPixelsPhysicalSizeX(0).unit().getSymbol(); % returns the default unit
voxelSizeX = omeMeta.getPixelsPhysicalSizeX(0).value(ome.units.UNITS.MICROM); % in µm
voxelSizeXdouble = voxelSizeX.doubleValue(); % The numeric value represented
voxelSizeY = omeMeta.getPixelsPhysicalSizeY(0).value(ome.units.UNITS.MICROM); % in µm
voxelSizeYdouble = voxelSizeY.doubleValue(); % The numeric value represented
voxelSizeZ = omeMeta.getPixelsPhysicalSizeZ(0).value(ome.units.UNITS.MICROM); % in µm
voxelSizeZdouble = voxelSizeZ.doubleValue(); % The numeric value represented
```

For more information about the methods to retrieve the metadata, see the [MetadataRetrieve](#)⁴⁸ Javadoc page.

To convert the OME metadata into a string, use the `dumpXML()` method:

```
omeXML = char(omeMeta.dumpXML());
```

13.5.3 Reading from an image file

The main inconvenience of the `bfopen.m`⁴⁹ function is that it loads all the content of an image regardless of its size.

To access the file reader without loading all the data, use the low-level `bfGetReader.m`⁵⁰ function:

```
reader = bfGetReader('path/to/data/file');
```

You can then access the OME metadata using the `getMetadataStore()` method:

```
omeMeta = reader.getMetadataStore();
```

Individual planes can be queried using the `bfGetPlane.m`⁵¹ function:

⁴⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/meta/MetadataRetrieve.html>

⁴⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/bfopen.m>

⁵⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/bfGetReader.m>

⁵¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/bfGetPlane.m>

```
series1_plane1 = bfGetPlane(reader, 1);
```

To switch between series in a multi-image file, use the `setSeries(int)`⁵² method. To retrieve a plane given a set of (z , c , t) coordinates, these coordinates must be linearized first using `getIndex(int, int, int)`⁵³

```
% Read plane from series iSeries at Z, C, T coordinates (iZ, iC, iT)
% All indices are expected to be 1-based
reader.setSeries(iSeries - 1);
iPlane = reader.getIndex(iZ - 1, iC - 1, iT - 1) + 1;
I = bfGetPlane(reader, iPlane);
```

13.5.4 Saving files

The basic code for saving a 5D array into an OME-TIFF file is located in the `bfsave.m`⁵⁴ function.

For instance, the following code will save a single image of 64 pixels by 64 pixels with 8 unsigned bits per pixels:

```
plane = zeros(64, 64, 'uint8');
bfsave(plane, 'single-plane.ome.tiff');
```

And the following code snippet will produce an image of 64 pixels by 64 pixels with 2 channels and 2 timepoints:

```
plane = zeros(64, 64, 1, 2, 2, 'uint8');
bfsave(plane, 'multiple-planes.ome.tiff');
```

By default, `bfsave` will create a minimal OME-XML metadata object containing basic information such as the pixel dimensions, the dimension order and the pixel type. To customize the OME metadata, it is possible to create a metadata object from the input array using `createMinimalOMEXMLMetadata.m`⁵⁵, add custom metadata and pass this object directly to `bfsave`:

```
plane = zeros(64, 64, 1, 2, 2, 'uint8');
metadata = createMinimalOMEXMLMetadata(plane);
pixelSize = ome.units.quantity.Length(java.lang.Double(.05), ome.units.UNITS.MICROM);
metadata.setPixelsPhysicalSizeX(pixelSize, 0);
metadata.setPixelsPhysicalSizeY(pixelSize, 0);
pixelSizeZ = ome.units.quantity.Length(java.lang.Double(.2), ome.units.UNITS.MICROM);
metadata.setPixelsPhysicalSizeZ(pixelSizeZ, 0);
bfsave(plane, 'metadata.ome.tiff', 'metadata', metadata);
```

For more information about the methods to store the metadata, see the `MetadataStore`⁵⁶ Javadoc page.

13.5.5 Improving reading performance

Initializing a Bio-Formats reader can consume substantial time and memory. Most of the initialization time is spent in the `setId(java.lang.String)`⁵⁷ call. Various factors can impact the performance of this step including the file size, the amount of metadata in the image and also the file format itself.

One solution to improve reading performance is to use Bio-Formats memoization functionalities with the `loci.formats.Memoizer`⁵⁸ reader wrapper. By essence, the speedup gained from memoization will only happen after the first initialization of the reader for a particular file.

⁵²[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#setSeries\(int\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#setSeries(int))

⁵³[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getIndex\(int, int, int\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getIndex(int, int, int))

⁵⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/bfsave.m>

⁵⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/createMinimalOMEXMLMetadata.m>

⁵⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/meta/MetadataStore.html>

⁵⁷[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatHandler.html#setId\(java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatHandler.html#setId(java.lang.String))

⁵⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html>

The simplest way to make use the Memoizer functionalities in MATLAB is illustrated by the following example:

```
% Construct an empty Bio-Formats reader
r = bfGetReader();
% Decorate the reader with the Memoizer wrapper
r = loci.formats.Memoizer(r);
% Initialize the reader with an input file
% If the call is longer than a minimal time, the initialized reader will
% be cached in a file under the same directory as the initial file
% name .large_file.bfmemo
r.setId(pathToFile);

% Perform work using the reader

% Close the reader
r.close()

% If the reader has been cached in the call above, re-initializing the
% reader will use the memo file and complete much faster especially for
% large data
r.setId(pathToFile);

% Perform additional work

% Close the reader
r.close()
```

If the time required to call `setId(java.lang.String)`⁵⁹ method is larger than `DEFAULT_MINIMUM_ELAPSED`⁶⁰ or the minimum value passed in the constructor, the initialized reader will be cached in a memo file under the same folder as the input file. Any subsequent call to `setId()` with a reader decorated by the Memoizer on the same input file will load the reader from the memo file instead of performing a full reader initialization.

More constructors are described in the Memoizer javadocs⁶¹ allowing to control the minimal initialization time required before caching the reader and/or to define a root directory under which the reader should be cached.

As Bio-Formats is not thread-safe, reader memoization offers a new solution to increase reading performance when doing parallel work. For instance, the following example shows how to combine memoization and MATLAB `parfor` to do work on a single file in a parallel loop:

```
% Construct a Bio-Formats reader decorated with the Memoizer wrapper
r = loci.formats.Memoizer(bfGetReader(), 0);
% Initialize the reader with an input file to cache the reader
r.setId(pathToFile);
% Close reader
r.close()

nWorkers = 4;

% Enter parallel loop
parfor i = 1 : nWorkers
    % Initialize a new reader per worker as Bio-Formats is not thread safe
    r2 = javaObject('loci.formats.Memoizer', bfGetReader(), 0);
    % Initialization should use the memo file cached before entering the
    % parallel loop
    r2.setId(pathToFile);

    % Perform work

    % Close the reader
```

⁵⁹[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html#setId\(java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html#setId(java.lang.String))

⁶⁰http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html#DEFAULT_MINIMUM_ELAPSED

⁶¹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html>

```

    r2.close()
end

```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁶²](#) or the [previous versions⁶³](#) page to find documentation for the version you are using.

13.6 Using Bio-Formats in Python

OME does not currently provide a Python implementation for Bio-Formats.

The *CellProfiler* project has implemented a Python wrapper around Bio-Formats used by the CellProfiler software which can be installed using *pip*:

```
pip install python-bioformats
```

See also:

<https://pypi.python.org/pypi/python-bioformats> Source code of the CellProfiler Python wrapper for Bio-Formats

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁶⁴](#) or the [previous versions⁶⁵](#) page to find documentation for the version you are using.

13.7 Interfacing with Bio-Formats from non-Java code

Bio-Formats is written in Java, and is easiest to use with other Java code. However, it is possible to call Bio-Formats from a program written in another language. But how to do so depends on your program's needs.

Technologically, there are two broad categories of solutions: **in-process** approaches, and **inter-process** communication.

For details, see LOCI's article [Interfacing from non-Java code⁶⁶](#).

Recommended **in-process** solution: *JACE C++ bindings for the Java API*

Recommended **inter-process** solution: *Subimager*

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁶⁷](#) or the [previous versions⁶⁸](#) page to find documentation for the version you are using.

13.7.1 JACE C++ bindings for the Java API

To make Bio-Formats accessible to software written in C++, we have created a Bio-Formats C++ interface (BF-CPP for short). It uses LOCI's *jar2lib⁶⁹* program to generate a C++ proxy class for each equivalent Bio-Formats Java class. The resulting proxies are then compiled into a library, which represents the actual interface from C++ to Bio-Formats. Using this library in your projects gives you access to the image support of Bio-Formats.

BF-CPP comes with some standalone examples which you can use as a starting point in your own project:

- [showinf⁷⁰](#)

⁶²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶³<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁶<http://loci.wisc.edu/software/interfacing-non-java-code>

⁶⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁹<http://loci.wisc.edu/software/jar2lib>

⁷⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/cppwrap/showinf.cpp>

- [minimum_writer](#)⁷¹

Other projects using BF-CPP include:

- [WiscScan](#)⁷² which uses BF-CPP to write [OME-TIFF](#)⁷³ files.
- [XuvTools](#) which uses an adapted version of BF-CPP called [BlitzBioFormats](#)⁷⁴.

See the [build instructions](#) ([Windows](#), [Mac OS X](#), [Linux](#)) for details on compiling BF-CPP from source. Once this is done, simply include it in your project as you would any other external library.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁵ or the [previous versions](#)⁷⁶ page to find documentation for the version you are using.

13.7.2 Build instructions for C++ bindings

This package provides language bindings for calling into the Bio-Formats Java library from C++ in a cross-platform manner. As of this writing the bindings are functional with GCC on Linux and Mac OS X systems, as well as with Visual C++ 2005 and Visual C++ 2008 on Windows.

Compile-time dependencies

To build the Bio-Formats C++ bindings from source, the following modules are required:

- [Apache Maven](#)⁷⁷ Maven is a software project management and comprehension tool. Along with Ant, it is one of the supported build systems for the Bio-Formats Java library, and is used to generate the Bio-Formats C++ bindings.
- [CMake](#)⁷⁸ CMake is a cross-platform, open source build system generator, commonly used to build C++ projects in a platform-independent manner. CMake supports GNU make as well as Microsoft Visual Studio, allowing the Bio-Formats C++ bindings to be compiled on Windows, Mac OS X, Linux and potentially other platforms.
- [Boost Thread](#)⁷⁹ Boost is a project providing open source portable C++ source libraries. It has become a suite of de facto standard libraries for C++. The Bio-Formats C++ bindings require the Boost Thread module in order to handle C++ threads in a platform independent way.
- [Java Development Kit](#)⁸⁰ At runtime, only the Java Runtime Environment (JRE) is necessary to execute the Bio-Formats code. However, the full J2SE development kit is required at compile time on some platforms (Windows in particular), since it comes bundled with the JVM shared library (jvm.lib) necessary to link with Java.

For information on installing these dependencies, refer to the page for your specific platform: [Windows](#), [Mac OS X](#), [Linux](#).

How to build

The process of building the Bio-Formats C++ bindings is divided into two steps:

1. Generate a C++ project consisting of “proxies” which wrap the Java code. This step utilizes the Maven project management tool, specifically a Maven plugin called `cppwrap`.
2. Compile this generated C++ project. This step utilizes the cross-platform CMake build system.

For details on executing these build steps, refer to the page for your specific platform: [Windows](#), [Mac OS X](#), [Linux](#).

Build results

If all goes well, the build system will:

1. Generate the Bio-Formats C++ proxy classes;

⁷¹https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/cppwrap/minimum_writer.cpp

⁷²<http://loci.wisc.edu/software/wiscscan>

⁷³<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff>

⁷⁴<http://www.xuvtools.org/devel:libblitzbioformats>

⁷⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁶<http://www.openmicroscopy.org/site/support/legacy/>

2. Build the Jace C++ library;
3. Build the Java Tools C++ library;
4. Build the Bio-Formats C++ shared library;
5. Build the showinf and minimum_writer command line tools, for testing the functionality.

Please be patient, as the build may require several minutes to complete.

Afterwards, the `dist/formats-bsd` subdirectory will contain the following files:

1. **libjace.so / libjace.jnilib / jace.dll** : Jace shared library
2. **libformats-bsd.so / libformats-bsd.dylib / formats-bsd.dll** : C++ shared library for BSD-licensed readers and writers
3. **jace-runtime.jar** : Jace Java classes needed at runtime
4. **bioformats_package.jar** : Bio-Formats Java library needed at runtime
5. **libjtools.so / libjtools.jnilib / jtools.dll** : Java Tools shared library
6. **showinf / showinf.exe** : Example command line application
7. **minimum_writer / minimum_writer.exe** : Example command line application

Items 1-4 are necessary and required to deploy Bio-Formats with your C++ application. Item 5 (jtools) is a useful helper library for managing the Java virtual machine from C++, but is not strictly necessary to use Bio-Formats. All other files, including the example programs and various build files generated by CMake, are not needed.

If you prefer, instead of using the `bioformats_package.jar` bundle, you can provide individual JAR files as appropriate for your application. For details, see *using Bio-Formats as a Java library*.

Please direct any questions to the OME team on the [forums](#)⁸¹ or [mailing lists](#)⁸².

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁸³ or the [previous versions](#)⁸⁴ page to find documentation for the version you are using.

13.7.3 Building C++ bindings in Windows

Compile-time dependencies – Windows

Windows users will need to visit the appropriate web sites and download and install the relevant binaries for all the dependencies.

To configure the tools, you will need to edit or create several environment variables on your system. Access them by clicking the “Environment Variables” button from Control Panel, System, Advanced tab. Use semicolons to separate multiple directories in the PATH variable.

Compile-time dependencies – Windows – Maven

Download [Maven](#)⁸⁵.

Unpack the Maven archive into your Program Files, then add the folder’s bin subdirectory to your PATH environment variable; e.g.:

```
C:\Program Files\apache-maven-3.0.4\bin
```

Once set, new Command Prompts will recognize “mvn” as a valid command.

⁸¹<http://www.openmicroscopy.org/community/>

⁸²<http://lists.openmicroscopy.org.uk/mailman/listinfo/>

⁸³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁸⁵<http://maven.apache.org/>

Compile-time dependencies – Windows – CMake

Download and run the [CMake installer](#)⁸⁶.

During installation, select the “Add CMake to the system PATH for all users” option to ensure that Bio-Formats build system can find your CMake executable.

Once installed, new Command Prompts will recognize “cmake” and “cmake-gui” as valid commands.

Compile-time dependencies – Windows – Boost

Download [Boost](#)⁸⁷.

You can either build and install from source using the instructions in the Boost documentation, or follow the link under ‘Other downloads’ to the prebuilt binaries for several Visual Studio versions.

Compile-time dependencies – Windows – Java Development Kit

Download and install the [JDK](#)⁸⁸.

After the installation is complete, create a new environment variable called JAVA_HOME pointing to your Java installation; e.g.:

```
C:\Program Files\Java\jdk1.6.0_25
```

Setting JAVA_HOME is the easiest way to ensure that Maven can locate Java.

You will also need to append your JDK’s client or server VM folder to the PATH; e.g.:

```
%JAVA_HOME%\jre\bin\client
```

This step ensures that a directory containing jvm.dll is present in the PATH. If you do not perform this step, you will receive a runtime error when attempting to initialize a JVM from native code.

Optionally, you can add the bin subdirectory to the PATH; e.g.:

```
%JAVA_HOME%\bin
```

Once set, new Command Prompts will recognize (e.g.) “javac” as a valid command.

Compile-time dependencies – Windows – Visual C++

In addition to the other prerequisites, you will also need a working copy of Visual C++. We have tested compilation with Visual C++ 2005 Professional and Visual C++ 2008 Express; other versions may or may not work.

You can download [Visual C++ Express for free](#)⁸⁹.

You must launch the environment at least once before you will be able to compile the Bio-Formats C++ bindings.

How to build - Windows

Run Command Prompt and change to your Bio-Formats working copy. Then run:

```
# generate the Bio-Formats C++ bindings
cd components\formats-bsd
mvn -DskipTests package dependency:copy-dependencies cppwrap:wrap

# build the Bio-Formats C++ bindings
cd target\cppwrap
mkdir build
```

⁸⁶<http://cmake.org/>

⁸⁷<http://www.boost.org/users/download/>

⁸⁸<http://www.oracle.com/technetwork/java/javase/downloads/>

⁸⁹<http://www.microsoft.com/express/>

```
cd build
cmake-gui ..
```

The CMake GUI will open. Click the Configure button, and a dialog will appear. Select your installed version of Visual Studio, and click Finish.

When configuring, you can use the J2L_WIN_BUILD_DEBUG flag to indicate if this will be a Debug or Release build. If the flag is checked it will build as Debug, unchecked will build as Release.

Once configuration is complete, click Configure again, repeating as necessary until the Generate button becomes available. Then click Generate. Once generation is complete, close the CMake window.

Back at the Command Prompt, type:

```
start jace.sln
```

The solution will then open in Visual Studio. Select Release or Debug as appropriate from the drop-down menu. Press F7 to compile (or select Build Solution from the Build menu).

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁹⁰](#) or the [previous versions⁹¹](#) page to find documentation for the version you are using.

13.7.4 Building C++ bindings in Mac OS X

Compile-time dependencies – Mac OS X

To install dependencies on Mac OS X, we advise using [Homebrew⁹²](#):

```
brew install maven cmake boost
```

Unless otherwise configured, this will install binaries into /usr/local/.

How to build – Mac OS X

The following commands will generate and build the Bio-Formats C++ bindings:

```
# generate the C++ bindings
cd components/formats-bsd
mvn -DskipTests package dependency:copy-dependencies cppwrap:wrap

# compile the C++ bindings
cd target/cppwrap
mkdir build
cd build
cmake ..
make
```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁹³](#) or the [previous versions⁹⁴](#) page to find documentation for the version you are using.

⁹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹¹<http://www.openmicroscopy.org/site/support/legacy/>

⁹²<https://github.com/mxcl/homebrew/>

⁹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹⁴<http://www.openmicroscopy.org/site/support/legacy/>

13.7.5 Building C++ bindings in Linux

Compile-time dependencies – Linux

The following directions are specific to Ubuntu Linux. Other Linux distributions may have similar packages available; check your package manager.

To install dependencies on Ubuntu Linux, execute:

```
# install code generation prerequisites
sudo aptitude install maven2

# install build prerequisites
sudo aptitude install build-essential cmake libboost-thread-dev

# install Java Development Kit
sudo aptitude install sun-java6-jdk
sudo update-alternatives --config java
```

Then select Sun's Java implementation as the system default.

It may be possible to use a different Java compiler (i.e., omit the sun-java6-jdk package and update-alternatives step), but we have only tested the compilation process with Sun's Java compiler.

How to build – Linux

The following commands will generate and build the Bio-Formats C++ bindings:

```
# generate the Bio-Formats C++ bindings
cd components/formats-bsd
mvn -DskipTests package dependency:copy-dependencies cppwrap:wrap

# build the Bio-Formats C++ bindings
cd target/cppwrap
mkdir build
cd build
cmake ..
make
```

USING BIO-FORMATS AS A NATIVE C++ LIBRARY

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](http://www.openmicroscopy.org/site/support/bio-formats5.0/) or the [previous versions²](http://www.openmicroscopy.org/site/support/legacy/) page to find documentation for the version you are using.

14.1 C++ overview

A completely native Bio-Formats C++ interface is now available. Unlike the JACE bindings, this does not wrap the Java implementation. With this release, TIFF reading and writing, and OME-TIFF reading are available. OME-TIFF writing will be available soon. All other readers and writers from the Java implementation are currently unavailable; the intention is that support for these will be added over time.

Note: The C++ implementation is functional in Bio-Formats version 5.1. However, API stability will not be guaranteed until version 5.2 since it may be necessary to refactor certain parts of the API for optimal usability, robustness and performance. Applications built against version 5.1 of the API may require updating to work with version 5.2, if they make use of any part of the API which is changed incompatibly.

14.1.1 Prebuilt packages

MacOS X Homebrew

Run:

```
brew tap homebrew/science
brew install bioformats-cpp [--without-docs] [--with-qt5]
```

--without-docs

Do not build the HTML version of this manual (built by default).

--with-qt5

Build the Qt5 OpenGL viewer widget library `ome-qtwidgets` and `bf-test view` image viewer (not built by default).

14.1.2 Prerequisites

In order to build the C++ library and its documentation, a number of packages are required to be installed. Note that the minimum version is the minimum version we regularly test with; older versions may work but are not supported. Some packages are required only for building Bio-Formats (*BF build*). A subset of these are required for building client applications making use of Bio-Formats (*Client build*) For end-user deployment (*Deploy*), the library packages rather than the development packages should be preferred; in some cases such as for Boost and Qt5, these are split up into a separate package for each library.

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

Package	Version		When required		
	Recommended	Minimum	BF build	Client build	Deploy
Boost	1.54	1.48	•	•	•
HDF5	1.8.x	1.8.x	◦	◦	◦
PNG	1.2	1.2	•	•	•
TIFF	4.0.3	3.9.5	•	•	•
Xerces-C	3.0	3.0	•	•	•
GLM*	0.9.6	0.9.5	◦	◦	
Qt5*	5.2	5.0	◦	◦	◦
CMake	3.0	2.8.12	•		
Python	2.7	2.6	•		
Python Genshi	0.7	0.6	•		
Git	2.1.x	1.7.x	◦		
GTest	1.7	1.5	◦		
Doxygen†	1.8	1.6	◦		
Graphviz†	2.x	1.8.10	◦		
Python Sphinx‡§	1.2.x	1.1.x	◦		
TeX (XeLaTeX)§	TeXLive 2014	TeXLive 2012	◦		

- Required for Bio-Formats build; headers may be needed for client build; libraries and any data files required for deployment
- Optional for Bio-Formats build; if used for the Bio-Formats build, headers may be required for client build and libraries and any data files required for deployment

* Optional, needed to build the OpenGL image viewer and client applications

† Optional, needed to build the API reference

‡ Optional, needed to build the manual pages

§ Optional, needed to build the manual (HTML and PDF)

Due to lacking a package manager, if building on Windows most of the above packages will require downloading and installing by hand. Links for these are provided below.

Quick start

Install the following packages to build Bio-Formats C++. A subset of these packages (or their dependencies) may be used for deployment, where the development package headers and tools for building documentation etc. are not required. Run the appropriate command below for your platform to install the build dependencies:

BSD Ports `pkg install devel/boost-all devel/cmake science/hdf5 graphics/png lang/python textproc/py-genshi graphics/tiff textproc/xerces-c3 devel/git devel/googletest math/glm devel/qt5 graphics/graphviz devel/apache-ant java/openjdk7 textproc/py-sphinx print/texlive-full`

Debian/Ubuntu `apt-get install build-essential libboost-all-dev cmake libhdf5-dev libpng12-dev python python-genshi libtiff5-dev libxerces-c-dev git libgtest-dev libglm-dev qt5-default libqt5-opengl5-dev libqt5-svg5-dev graphviz ant ant-contrib ant-optional openjdk-7-jdk openjdk-7-jre python-sphinx texlive-full`

Homebrew `brew install boost cmake hdf5 libpng python libtiff xerces-c git glm qt5 graphviz ant`

RedHat/CentOS `yum install libhdf5-devel libpng-devel python python-genshi libtiff-devel xerces-c-devel git gtest-devel graphviz java-1.7.0-openjdk`

Note that Homebrew and RedHat/CentOS do not provide packages for everything you need; see below for details.

Basic toolchain

A functional compiler, assembler and linker are required to build C++ code.

If possible, install the following packages:

System	Package
BSD Ports	N/A*
Debian/Ubuntu	build-essential
Homebrew	N/A†
RedHat/CentOS	N/A‡
Windows	N/A§

* Available by default

† Install **Xcode**

‡ Run `yum groupinstall "Development Tools"`

§ Install Visual Studio or [Visual Studio Express](#)³

Boost

If possible, install one of the following packages:

System	Package
BSD Ports	devel/boost-all
Debian/Ubuntu	libboost-all-dev
Homebrew	boost
RedHat/CentOS	boost-devel

1.48 or later needed for Boost.Geometry; 1.54 or later needed for Boost.Geometry spatial indexes. RHEL/CentOS 6 users might want to look at the [Boost 1.48 SCL](#)⁴ or build a more recent Boost release.

CMake

If possible, install the following packages:

System	Package
BSD Ports	devel/cmake
Debian/Ubuntu	cmake
Homebrew	cmake
RedHat/CentOS	cmake

- [Website](#)⁵
- [Download](#)⁶

HDF5

If possible, install the following packages:

System	Package
BSD Ports	science/hdf5
Debian/Ubuntu	libhdf5-dev
Homebrew	hdf5
RedHat/CentOS	libhdf5-devel

PNG

If possible, install the following packages:

³<http://www.visualstudio.com/downloads/download-visual-studio-vs#d-express-windows-desktop>

⁴<https://www.softwarecollections.org/en/scls/denisarnaud/boost148/>

⁵<http://cmake.org/>

⁶<http://cmake.org/cmake/resources/software.html>

System	Package
BSD Ports	graphics/png
Debian/Ubuntu	libpng12-dev
Homebrew	libpng
RedHat/CentOS	libpng-devel

Python

If possible, install the following packages:

System	Package
BSD Ports	lang/python
Debian/Ubuntu	python
Homebrew	python
RedHat/CentOS	python

- [Website](#)⁷
- [Download](#)⁸
- [Extra packages for Windows](#)⁹

For Python on Windows, either download separate installers for each package, or install `setuptools` and `pip` for Python, then `pip install` needed packages; ensure downloaded packages are 64-bit if using 64-bit Python.

Python Genshi

If possible, install the following packages:

System	Package
BSD Ports	textproc/py-genshi
Debian/Ubuntu	python-genshi
Homebrew	N/A
RedHat/CentOS	python-genshi

Use `pip install genshi` if a packaged version is not available.

TIFF

If possible, install the following packages:

System	Package
BSD Ports	graphics/tiff
Debian/Ubuntu	libtiff5-dev*
Homebrew	libtiff
RedHat/CentOS	libtiff-devel

* libtiff4-dev with older releases

4.0.2 and earlier do not have `TIFFField` accessor functions.

Xerces-C

If possible, install the following packages:

System	Package
BSD Ports	textproc/xerces-c3
Debian/Ubuntu	libxerces-c-dev
Homebrew	xerces-c
RedHat/CentOS	xerces-c-devel

⁷<https://www.python.org/>

⁸<https://www.python.org/download/releases/2.7.8/>

⁹<http://www.lfd.uci.edu/~gothke/pythonlibs/>

Git

If possible, install the following packages:

System	Package
BSD Ports	devel/git
Debian/Ubuntu	git
Homebrew	git
RedHat/CentOS	git

- [Website](#)¹⁰
- [Download](#)¹¹

Google Test (gtest)

If possible, install the following packages:

System	Package
BSD Ports	devel/googletest
Debian/Ubuntu	libgtest-dev
Homebrew	N/A*
RedHat/CentOS	gtest-devel

* [gtest is not available in homebrew](#)¹²

An embedded copy of GTest is provided; it is only necessary to use a system-provided or self-built copy of GTest if the embedded copy is not functional on a specific system.

If using an external GTest, make sure that `GTEST_ROOT` is set in the environment, or that `-DGTEST_ROOT=/path/to/gtest` is passed to **cmake** and that this points to the location where you installed the **gtest** library. If the library is located on the default library search path, this is not necessary.

- [Website](#)¹³
- [Zip download](#)¹⁴
- [SVN tag](#)¹⁵

GLM

If possible, install the following packages:

System	Package
BSD Ports	math/glm
Debian/Ubuntu	libglm-dev
Homebrew	glm
RedHat/CentOS	N/A

Note: Older versions will allow compilation but use degrees rather than radians, which will lead to unexpected results.

- [Website](#)¹⁶
- [Download](#)¹⁷

¹⁰<http://www.git-scm.com/>

¹¹<http://www.git-scm.com/downloads>

¹²<http://answers.ros.org/question/42335/mac-os-x-install-error-no-available-formula-for-gtest/>

¹³<https://code.google.com/p/googletest/>

¹⁴<https://code.google.com/p/googletest/downloads/detail?name=gtest-1.7.0.zip>

¹⁵<http://googletest.googlecode.com/svn/tags/release-1.7.0>

¹⁶<http://glm.g-truc.net/0.9.6/index.html>

¹⁷<http://sourceforge.net/projects/ogl-math/files/>

Qt5

If possible, install the following packages:

System	Package
BSD Ports	devel/qt5
Debian/Ubuntu	qt5-default libqt5-opengl5-dev libqt5-svg5-dev
Homebrew	qt5*
RedHat/CentOS	N/A

* Add `/usr/local/opt/qt5/bin` to `PATH`

- [Website¹⁸](#)
- [Download¹⁹](#)

Doxygen

System	Package
BSD Ports	devel/doxygen
Debian/Ubuntu	doxygen
Homebrew	doxygen
RedHat/CentOS	doxygen

- [Website²⁰](#)
- [Download²¹](#)

Graphviz

If possible, install the following packages:

System	Package
BSD Ports	graphics/graphviz
Debian/Ubuntu	graphviz
Homebrew	graphviz
RedHat/CentOS	graphviz

- [Website²²](#)
- [Download \(for Windows\)²³](#)

Apache Ant

If possible, install one of the following packages:

System	Package
BSD Ports	devel/apache-ant
Debian/Ubuntu	ant ant-contrib ant-optional
Homebrew	ant
RedHat/CentOS	N/A

- [Website²⁴](#)
- [Download²⁵](#)

¹⁸<http://www.qt.io/>

¹⁹<http://www.qt.io/download/>

²⁰<http://www.stack.nl/~dimitri/doxygen/>

²¹<http://www.stack.nl/~dimitri/doxygen/download.html>

²²<http://graphviz.org/>

²³http://graphviz.org/Download_windows.php

²⁴<http://ant.apache.org/>

²⁵<http://ant.apache.org/bindownload.cgi>

Java

If possible, install one of the following packages:

System	Package
BSD Ports	java/openjdk7
Debian/Ubuntu	openjdk-7-jdk openjdk-7-jre
Homebrew	N/A
RedHat/CentOS	java-1.7.0-openjdk

- [Download](#)²⁶

Python Sphinx

If possible, install the following packages:

System	Package
BSD Ports	textproc/py-sphinx
Debian/Ubuntu	python-sphinx
Homebrew	N/A (use pip)
RedHat/CentOS	N/A (use pip)

Use `pip install sphinx` if a packaged version is not available.

TeX

If possible, install the following packages:

System	Package
BSD Ports	print/texlive-full
Debian/Ubuntu	texlive-full
Homebrew	N/A*
RedHat/CentOS	N/A†

* Install TeXLive or MacTeX

† Provides an obsolete version; install TeXLive

- [TeXLive website \(for Unix\)](#)²⁷
- [TeXLive quick install \(for Unix\)](#)²⁸
- [MacTeX website \(for MacOS X\)](#)²⁹
- [MacTeX download \(for MacOS X\)](#)³⁰
- [MikTeX website \(for Windows\)](#)³¹
- [MikTeX download \(for Windows\)](#)³²

Local font configuration may be required to make the TeX Gyre fonts available:

- Linux and FreeBSD: Use the provided **fontconfig** template or create your own
- MacOS X: Add to system using **FontBook**
- Windows: May need adding to the system fonts if not found automatically

²⁶<http://www.oracle.com/technetwork/java/javase/downloads/jdk7-downloads-1880260.html>

²⁷<https://www.tug.org/texlive/>

²⁸<https://www.tug.org/texlive/quickinstall.html>

²⁹<https://tug.org/mactex/>

³⁰<http://mirror.ctan.org/systems/mac/mactex/MacTeX.pkg>

³¹<http://www.miktex.org/>

³²<http://www.miktex.org/download>

14.1.3 Build environment

General

Custom configuration is needed primarily on Windows, where the needed tools may not be on the search path by default. There are several possible approaches here:

- Add to the system environment (globally)
- Add to the user environment (affects a single user)
- Set in a batch file and run this to set up the environment on demand (local to the command shell)

The first will affect all programs running on the system and so may cause problems, particularly if multiple configurations or tool versions are to be used. The last offers the greatest flexibility and safety, and can be sourced automatically when starting a shell if a console replacement such as **ConsoleZ** is used.

- Activate a python virtualenv if needed
- Ensure that needed tools are on the user PATH (e.g. **ant**, **cmake**, **doxygen**, **dot**, **git**, **python**, **java**, **sphinx**, **xelatex**)
- Set **CMAKE_PREFIX_PATH** if some libraries and tools are not on the default search path. Not all tools need to be on the default path; some will be discovered automatically by **cmake**

Homebrew

If **qt5** and **glm** are installed, for building the Qt image viewer, ensure that `/usr/local/opt/qt5/bin` is on the PATH to allow Qt to be autodetected by **cmake**.

14.1.4 Source tree layout

Source tree layout:

```
cpp
-- cmake
-- ext
-- lib
|   -- ome
|       -- bioformats
|           -- detail
|           -- in
|           -- out
|           -- tiff
|       -- common
|           -- endian
|           -- xml
|           -- dom
|       -- compat
|       -- internal
|       -- qtwidgets
|       -- test
|       -- xml
-- libexec
|   -- info
|   -- view
-- share
-- test
```

Top-level directories inside **cpp**:

cmake CMake build infrastructure

ext External third-party code

lib Bio-Formats library headers and sources

libexec Bio-Formats internal binaries (not direct public API)

share Bio-Formats architecture-independent data files

test Bio-Formats unit tests

Components in `lib` and `test`:

bioformats Bio-Formats reader and writer interfaces and implementations

common Common functionality used by all other components

compat Compatibility workarounds

internal Private implementation details

qtwidgets Qt5 widgets for image rendering with OpenGL

test Unit test common functions

xml OME XML model and metadata

14.1.5 Configuring

Bio-Formats uses **cmake**, a generic cross-platform build system which generates build files for a large number of common build systems and IDEs. For example, on BSD, Linux and MacOS X, Unix **make** Makefile files may be created. On Windows, Visual Studio **msbuild** .sln solution files and .vcxproj project may be created. However, Eclipse, Sublime Text or several other IDEs or alternative build systems may be used instead, if desired.

Start by creating a temporary build directory. This directory may be in any location inside or outside the Bio-Formats source tree. However, you may not use the source directory as the build directory. (This fills the source tree full of autogenerated files.)

Run **cmake** from the temporary build directory:

```
% mkdir build
% cd build
% cmake /path/to/bioformats
```

Run `cmake -LH` to see the configurable project options; use `-LAH` to see advanced options. The following basic options are supported:

bioformats-superbuild=(ON|OFF) Build Bio-Formats as part of a “super-build” project. This will download and build all needed library dependencies (Boost, libtiff etc.) prior to building Bio-Formats. This option is disabled by default since most platforms provide all the libraries by default. However, it is enabled by default when using Microsoft Visual C++, since this platform does not provide libraries unless you have built your own.

cxxstd-autodetect=(ON|OFF) Enable or disable (default) C++ compiler standard autodetection. If enabled, the compiler will be put into C++11 mode if available, otherwise falling back to C++03 or C++98. If disabled, the default compiler standard mode is used, and it is the responsibility of the user to add the appropriate compiler options to build using the required standard. This is useful if autodetection fails or a compiler is buggy in certain modes (e.g. GCC 4.4 or 4.6 require `-std=gnu++98` or else `stdarg` support is broken).

doxygen=(ON|OFF) Enable doxygen documentation. These will be enabled by default if doxygen is found.

embedded-gtest=(ON|OFF) Enable the use of an embedded copy of the Google Test (gtest) library. This is off by default but will be enabled automatically if a system copy is not found. This may be enabled explicitly to override the autodetection.

extended-tests=(ON|OFF) Some of the unit tests are comprehensive and run many thousands of tests. These are enabled by default, but by setting to OFF a representative subset of the tests will be run instead to save time.

extra-warnings=(ON|OFF) Enable or disable additional compiler warnings in addition to the default set. These are disabled by default since they trigger a large number of false positives, particularly in third-party libraries outside our control.

fatal-warnings=(ON|OFF) Make compiler warnings into fatal errors. This is disabled by default.

sphinx=(ON|OFF) Build manual pages and HTML documentation with Sphinx. Enabled by default if Sphinx is autodetected.

sphinx-pdf=(ON|OFF) Build PDF documentation with Sphinx. Enabled by default if Sphinx and XeLaTeX are autodetected.

test=(ON|OFF) Enable unit tests. Tests are enabled by default.

For example, to disable tests, run `cmake -Dtest=OFF`. Options will typically be enabled by default if the prerequisites are available.

The installation prefix may be set at this point using `-DCMAKE_INSTALL_PREFIX=prefix`. The build system and compiler to use may also be specified. Please see the **cmake** documentation for further details of all configurable options, and run `cmake --help` to list the available generators for your platform.

C++11

C++11 features such as `std::shared_ptr` are used when using a C++11 or C++14 compiler, or when `-Dcxxstd-autodetect=ON` is used and the compiler can be put into a C++11 or C++14 compatibility mode. When using an older compatibility mode such as C++98, the Boost equivalents of C++11 library features will be used as fallbacks to provide the same functionality. In both cases these types are imported into the `ome::compat` namespace, for example as `ome::compat::shared_ptr`, and the types in this namespace should be used for portability when using any part of the API which use types from this namespace.

Linux and MacOS X

The default generator is `Unix Makefiles`, and the standard `CXX`, `CXXFLAGS` and `LDFLAGS` environment variables may be set to explicitly specify the compiler, compiler flags and linker flags, respectively. These may be useful for adding additional `-I` and `-L` include and library search paths, for example.

If you wish to use an IDE such as Eclipse or KDevelop, an alternative generator may be used.

Windows

On Windows, the generator will require specifying by hand, and this will configure the version of Visual Studio (or other compiler) to use. For example, `-G "Visual Studio 11 Win64"` will configure for generating Visual Studio 2012 64-bit build files for use with the Visual C++ compiler.

Note: There is no need to use the Visual Studio command shell when running **cmake**.

14.1.6 Building

For all platforms and generators, it should usually be possible to build using:

```
% cmake --build
```

which will invoke the platform- and generator-specific build as appropriate.

To build the API reference documentation, run:

```
% cmake --build . --target doc
```

Linux and MacOS X

If using `Unix Makefiles`, simply run:

```
% make
```

with any additional options required, for example `-j` to enable parallel building, or `VERBOSE=1` to show the details of every command being executed.

To build the API reference documentation, run:

```
% make doc
```

If using an IDE, open the generated project file and proceed using the IDE to build the project.

Windows

If using Visual Studio, the generated project files may be opened using the IDE and then built within the IDE. Alternatively, the project files may be built directly using the **msbuild** command-line tool inside a Visual Studio command prompt (or an appropriately configured command prompt which has run **VCVARSALL.BAT** or equivalent to configure the environment).

14.1.7 Testing

For all platforms and generators, it should usually be possible to run all tests using **ctest**. Run:

```
% ctest
```

or to run verbosely:

```
% ctest -V
```

Additional flags allow specification of the build configuration to use, logging, parallel building and other options. Please see the **ctest** documentation for further details.

Individual test programs may be run by hand if required.

Linux and MacOS X

To run all tests, run:

```
% cmake --build . --target test
```

or verbosely:

```
% cmake --build . --target test -- ARGS=-V
```

If using Unix Makefiles, simply run:

```
% make test
```

or verbosely:

```
% make test ARGS=-V
```

Windows

To run all tests, run:

```
> msbuild RUN_TESTS.vcproj
```

14.1.8 Installation

Linux and MacOS X

To install the headers and libraries directly on the system into the configured prefix:

```
% cmake --build . --target install
```

Alternatively, to install into a staging directory:

```
% cmake --build . --target install -- DESTDIR=/path/to/staging/directory install
```

If using Unix Makefiles, simply run:

```
% make install
```

Alternatively, to install into a staging directory:

```
% make DESTDIR=/path/to/staging/directory install
```

Windows

When using Visual Studio, there should be an `INSTALL.vcxproj` project which may be run using **msbuild**, for example:

```
> msbuild INSTALL.vcxproj /p:platform=x64
```

Installation layout

A typical installation layout:

```
$CMAKE_INSTALL_PREFIX
-- bin
-- include
|   -- ome
|       -- bioformats
|       -- common
|       -- compat
|       -- xml
-- lib
-- libexec
-- share
|   -- icons
|   -- man
|   -- xml
```

14.1.9 Using the library

The [Doxygen API reference](#)³³ is used to document all aspects of the Bio-Formats API.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁴ or the previous

³³<http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/annotated.html>

[versions](#)³⁵ page to find documentation for the version you are using.

14.2 C++ conversion details

The C++ codebase has been primarily a conversion of the original Java codebase, with some additional helper functions and classes added where needed. The intention is that the basic interfaces and classes should be identical between the two languages unless this is prevented by fundamental differences between the languages.

This section is intended to be useful for

- Users of the existing Java interface, who wish to understand the differences between the two implementations
- Developers who wish to work on the C++ interface

In addition to documenting the specific language and class compatibility issues, this section also documents the idioms in use in the C++ code which might not be immediately clear by looking at the API reference, and which may not be familiar to Java developers.

14.2.1 C++ and Java type incompatibility

While C++ and Java have some basic syntactical similarities, there are several basic differences in their type systems.

Java types

Java has primitive types and classes.

```
int i;
double d;
```

- No unsigned primitive integer types

```
Pixels pixels = new Pixels();
```

- All classes are derived from root `Object`
- Objects are by reference only
- Objects and arrays are always allocated with `new`
- Destruction is non-deterministic
- All passing is by value (primitives and object references)

```
Pixels[] array = new Pixels[5];
```

- Arrays have an intrinsic size.
- Arrays are safe to index out of bounds (an exception is thrown).

C++ types

C++ has primitive types, structures and classes.

³⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵<http://www.openmicroscopy.org/site/support/legacy/>

```
int16_t i1;
uint32_t i2;
double d;
```

- Primitive integer types may be signed or unsigned.
- Integer types are of defined size.

```
// Allocate on the stack, or as a struct or class member:
Pixels          pixels;

// Allocate on the heap
Pixels          *pixelsptr1 = new Pixels();

// Pointer to existing instance
const Pixels    *pixelsptr2 = &pixels;

// Reference to existing instance
Pixels&         pixelsref(pixels);
```

- Classes have no common root
- All types may be instances, pointers or references
- Object construction may be on the stack, on the heap using `new` or in place using placement `new`.
- Pointers and references may refer to `const` type
- Pointers may be `const`
- References are implicitly `const` (similar to `final`)
- Destruction is deterministic
- `new` **should never be used** in modern C++ code (see below)

```
Pixels array[5];
```

- Arrays “decay” to bare pointers
- Arrays are not safe to index out of bounds
- Size information lost at runtime
- **Never use arrays** outside static initializers

Simplified type names

`typedef` is used to create an alias for an existing type.

```
typedef std::vector<std::string> string_list;
string_list l;
string_list::const_iterator i = l.begin();
// NOT std::vector<std::string>::const_iterator

typedef std::vector<Pixels> plist;
plist pl(6);
plist::size_type idx = 2;
// size_type NOT unsigned int or uint32_t
pl.at(idx) = ...;
```

Used in standard container types e.g. `size_type`, `value_type` and in classes and class templates in Bio-Formats. Consistency is needed for generic programming—use the standard type names to enable interoperability with standard algorithms.

14.2.2 Exception handling

Java

`throws` details which exceptions are thrown by a method. Java exceptions are also “checked”, requiring the caller to catch and handle all exceptions which might be thrown, aside from `RuntimeException` and its subclasses.

C++

C++ has exception specifications like Java, however they are useless aside from `nothrow`. This is because if an exception is thrown which does not match the specification, it will abort the program with a `bad_exception` which makes them unusable in practice.

Exceptions can be thrown at any point with the exception that they should **never be thrown in a destructor**. It is not necessary or typical to check exceptions except where needed. All code must be exception-safe given that an exception could be thrown at any point; the design considerations for exception safety are covered below.

14.2.3 Interfaces

Java supports single-inheritance, plus interfaces. C++ supports true multiple-inheritance, which is rather more flexible, at the expense of being rather more complicated and dangerous. However, the Java single-inheritance-plus-interfaces model can be implemented in C++ using a subset of the facilities provided by multiple inheritance. Rather than being enforced by the language, it is a set of idioms. These must be rigorously followed or else things will fail horribly!

C++ interfaces are classes with:

- No instance variables
- Pure virtual methods
- `protected` default constructor
- `public virtual` destructor
- Deleted copy constructor and assignment operator

C++ classes implementing interfaces:

- Use `public` inheritance for parent class
- Use `virtual public` inheritance for implemented interfaces
- Have a `virtual` destructor

When compiled with optimization enabled, the interface classes should have zero storage overhead. If implementing classes do not use `virtual public` inheritance, compilation will fail as soon as a second class in the inheritance hierarchy also implements the interface.

14.2.4 Reference handling and memory management

Pointer problems

Plain (or “dumb”) C++ pointers can be dangerous if used incorrectly. The Bio-Formats API make a point of never using them unless absolutely necessary. For automatic objects allocated on the stack, allocation and deallocation is automatic and safe:

```
{
    Image i(filename);
    i.read_plane();

    // Object destroyed when i goes out of scope
}
```

In this case, the object’s destructor was run and the memory freed automatically.

Looking at the case where a pointer is used to reference manually-allocated memory on the heap:

```
{
    Image *i = new Image(filename);

    i->read_plane();

    // Memory not freed when pointer i goes out of scope
}
```

In this case `new` was not paired with the corresponding `delete`, resulting in a *memory leak*. This is the code with the “leak” fixed:

```
{
    Image *i = new Image(filename);

    i->read_plane(); // throws exception; memory leaked

    delete i; // never called
}
```

`new` and `delete` are now paired, but the code is not exception-safe. If an exception is thrown, memory will still be leaked. Manual memory management requires correct clean up for every exit point in the function, including both all `return` statements and thrown exceptions. Here, we handle this correctly:

```
{
    Image *i = new Image(filename);

    try {
        i->read_plane(); // throws exception
    } catch (const std::runtime_error& e) {
        delete i; // clean up
        throw; // rethrow
    }

    delete i; // never called for exceptions
}
```

However, this does not scale. This is painful and error prone when scaled to an entire codebase. Even within this simple function, there is only a single variable with a single exception and single return to deal with. Imagine the combinatorial explosion when there are several variables with different lifetimes and scopes, multiple return points and several exceptions to handle—this is easy to get wrong, so a more robust approach is needed.

Use of `new` is not in the general case safe or sensible. The Bio-Formats API **never** passes pointers allocated with `new`, nor requires any manual memory management. Instead, “smart” pointers are used throughout to manage memory safely and automatically.

`ome::compat::shared_ptr` as a “smart” pointer

The unsafe example above, has been rewritten to use `ome::compat::shared_ptr`:

```
// Start of block
{
    ome::compat::shared_ptr<Image> i(ome::compat::make_shared<Image>(filename));

    i->read_plane(); // throws exception

    // Memory freed when i's destructor is
```

```
// run at exit of block scope
}
```

Rather than managing the memory by hand, responsibility for this is delegated to a “smart” pointer, `ome::compat::shared_ptr`. The memory is freed by the `ome::compat::shared_ptr` destructor which is run at the end of the block scope, on explicit `return`, or when cleaned up by exception stack unwinding.

Note: `ome::compat::shared_ptr` is either a `std::shared_ptr` or a `boost::shared_ptr`, depending upon whether C++11 features are available or not, respectively.

- `shared_ptr` object lifetime manages the resource
- `new` replaced with `ome::compat::make_shared`
- May be used as class members; lifetime is tied to class instance
- Clean up for all exit points is automatic and safe
- Allows ownership transfer and sharing
- Allows reference without ownership using `weak_ptr`
- `weak_ptr` references the object but does not prevent it being freed when the last `shared_ptr` reference is lost; this is useful for cycle breaking and is used by the OME XML model objects for references

Resource Acquisition Is Initialization

Resource Acquisition Is Initialization (RAII) is a programming idiom used throughout modern C++ libraries and applications, including the Standard Library,

- A class is a proxy for a resource
- The resource is acquired when object is initialised
- The resource is released when object is destroyed
- Any resource may be managed (e.g. memory, files, locks, mutexes)
- The C++ language and runtime guarantees make resource management deterministic and reliable
- Safe for use in any scope
- Exception safe
- Used throughout modern C++ libraries and applications

Because this relies implicitly upon the deterministic object destruction guarantees made by the C++ language, this is not used widely in Java APIs which often require manual management of resources such as open files. Used carefully, RAII will prevent resource leaks and result in robust, safe code.

The `FormatReader` API is currently not using RAII due to the use of the `FormatHandler::setId()` interface.

C++ reference variants

<i>Non-constant</i>	<i>Constant</i>
<hr/>	
<i>Pointer</i>	
Image *i;	const Image *i;
Image * const i;	const Image * const i;
 <i>Reference</i>	
Image& i;	const Image& i;
 <i>Shared pointer</i>	
ome::compat::shared_ptr<Image> i;	ome::compat::shared_ptr<const Image> i;

```

const ome::compat::shared_ptr<Image> i;      const ome::compat::shared_ptr<const Image> i;

// Shared pointer reference
ome::compat::shared_ptr<Image>& i;             ome::compat::shared_ptr<const Image>& i;
const ome::compat::shared_ptr<Image>& i;      const ome::compat::shared_ptr<const Image>& i;

// Weak pointer
ome::compat::weak_ptr<Image> i;                ome::compat::weak_ptr<const Image> i;
const ome::compat::weak_ptr<Image> i;         const ome::compat::weak_ptr<const Image> i;

// Weak pointer reference
ome::compat::weak_ptr<Image>& i;                ome::compat::weak_ptr<const Image>& i;
const ome::compat::weak_ptr<Image>& i;         const ome::compat::weak_ptr<const Image>& i;

```

Java has one reference type. Here, we have **22**. Clearly, not all of these will typically be used. Below, a subset of these are shown for use for particular purposes.

Class member types:

```

Image i;                                     // Concrete instance
ome::compat::shared_ptr<Image> i;            // Reference
ome::compat::weak_ptr<Image> i;              // Weak reference

```

Wherever possible, a concrete instance should be preferred. This is not possible for polymorphic types, where a reference is required. In this situation, an `ome::compat::shared_ptr` is preferred if the class owns the member and/or needs control over its lifetime. If the class does not have ownership then an `ome::compat::weak_ptr` will allow safe access to the object if it still exists. In circumstances where manual lifetime management is required, e.g. for performance, and the member is guaranteed to exist for the duration of the object's lifetime, a plain pointer or reference may be used. A pointer will be used if it is possible for it to be `null`, or it may be reassigned more than once, or if it is assigned after initial construction. If properly using RAII, using references should be possible and preferred over bare pointers in all cases.

Argument types:

```

// Ownership retained
void read_plane(const Image& image);
// Ownership shared or transferred
void read_plane(const ome::compat::shared_ptr<Image>& image);

```

Passing primitive types by value is acceptable. However, passing a struct or class by value will implicitly copy the object into the callee's stack frame, which may be expensive (and requires a copy constructor which will not be guaranteed or even possible for polymorphic types). Passing by reference avoids the need for any copying, and passing by `const` reference will prevent the callee from modifying the object, also making it clear that there is no transfer of ownership. Passing using an `ome::compat::shared_ptr` is possible but not recommended—the copy will involve reference counting overhead which can kill multi-threaded performance since it requires synchronization between all threads; use a `const` reference to an `ome::compat::shared_ptr` to avoid the overhead. If ownership should be transferred or shared with the callee, use a non-`const` reference.

To be absolutely clear, plain pointers are never used and are not acceptable for ownership transfer. A plain reference also makes it clear there is no ownership transfer.

Return types:

```

Image get_image(); // Ownership transferred
Image& get_image(); // Ownership retained
ome::compat::shared_ptr<Image> get_image(); // Ownership shared/trans
ome::compat::shared_ptr<Image>& get_image(); // Ownership shared

```

If the callee does not retain a copy of the original object, it can't pass by reference since it can't guarantee the object remaining in scope after it returns, hence it must create a temporary value and pass by value. If the callee does retain a copy, it has the option of passing by reference. Passing by reference is preferred when possible. Passing by value implies ownership transfer. Passing

by reference implies ownership retention. Passing an `ome::compat::shared_ptr` by value or reference implies sharing ownership since the caller can retain a reference; if passing by value ownership *may* be transferred since this implies the callee is not retaining a reference to it (but this is not guaranteed).

Again, to be absolutely clear, plain pointers are never used and are not acceptable for ownership transfer. A plain reference also makes it clear there is no ownership transfer.

- Safety: References cannot be `null`
- Storing polymorphic types requires use of a `shared_ptr`
- Referencing polymorphic types *may* require use of a `shared_ptr`
- Safety: To avoid cyclic dependencies, use `weak_ptr`
- Safety: To allow object destruction while maintaining a safe reference, use `weak_ptr`
- `weak_ptr` is not directly usable
- `weak_ptr` is convertible back to `shared_ptr` for use *if the object is still in existence*
- C++11 *move semantics* (`&&`) improve the performance of ownership transfer

14.2.5 Containers

Safe array passing

C++ arrays are not safe to pass in or out of functions since the size is not known unless passed separately.

```
class Image
{
    // Unsafe; size unknown
    uint8_t[] getLUT();
    void setLUT(uint8_t[] & lut);
};
```

C++ arrays “decay” to “bare” pointers, and pointers have no associated size information.

`ome::compat::array` is a safe alternative. This is either a C++11 `std::array` or `boost::array` with older compilers.

```
class Image
{
    typedef ome::compat::array<uint8_t, 256> LUT;

    // Safe; size defined
    const LUT& getLUT() const;
    void setLUT(const LUT&);
};
```

`ome::compat::array` is a array-like object (a class which behaves like an array). Its type and size are defined in the template, and it may be passed around like any other object. Its `array::at()` method provides strict bounds checking, while its `index array::operator[]()` provides unchecked access.

14.2.6 Storing and passing unrelated types

Types with a common base

```
std::vector<ome::compat::shared_ptr<Base> > v;
v.push_back(ome::compat::make_shared<Derived>());
```

This can store any type derived from `Base`. An `ome::compat::shared_ptr` is **essential**. Without it, bare pointers to the base would be stored, and memory would be leaked when elements are removed from the container (unless externally managed [generally unsafe]). The same applies to passing polymorphic types.

Java containers can be problematic:

- Java can store root `Object` in containers
- Java can pass and return root `Object` in methods.
- This is not possible in C++: there is no root object.
- An alternative approach is needed.

Arbitrary types

`boost::any` may be used to store any type:

```
std::vector<boost::any> v;
v.push_back(Anything);
```

- Assign and store any type
- Type erasure (similar to Java generics)
- Use for containers of arbitrary types
- Flexible, but need to cast to each type used to extract
- Code will not be able to handle all possible types meaningfully

This is the most flexible solution, but in order to get a value back out, requires casting it to its specific type. This can mean a situation could arise where values are stored of types which cannot be handled since it is not possible to write the code to handle every single possibility ahead of time. However, if the open-ended flexibility is needed, this is available.

A fixed set of types

`boost::variant` may be used to store a limited set of different types: This avoids the `boost::any` problem of not being able to handle all possible types, since the scope is limited to a set of allowed types, and a `static_visitor` can ensure that all types are supported by the code at compile time.

```
typedef boost::variant<int, std::string> variants;
std::vector<variants> v;
v.push_back(43);
v.push_back("ATTO 647N");
```

- Store a set of discriminated types
- “External polymorphism” via `static_visitor`
- Used to store original metadata
- Used to store nD pixel data of different pixel types

This is not an alternative to a common root object. Instead, this is a discriminated union, which can store one of a defined set of “variant” types. A static visitor pattern may be used to generate code to operate on all of the supported types. The variant type may be used as a class member, passed by value, passed by reference or stored in a container like any other type. Due to the way it is implemented to store values, it does not necessarily need wrapping in an `ome::compat::shared_ptr` since it can behave as a value type (depending upon the context).

Java uses polymorphism to store and pass the root `Object` around. The `boost::variant` and `boost::any` approaches use templates to (internally) create a common base and manage the stored objects. However, the end user does not need to deal with this complexity directly—the use of the types is quite transparent.

Variant example: MetadataMap

This example demonstrates the use of variants with a simple expansion for two different categories of type (scalars and vectors of scalars).

The MetadataMap class stores key-value pairs, where the value can be either a string, Boolean, or several integer and floating point types, or vectors of any of these types. When converting the data to other forms, it is necessary to flatten the vector types to a set of separate key-value pairs with the key having a numbered suffix, one for each element in the vector.

```
{
    MetadataMap map;
    MetadataMap flat_map (map.flatten());
}
```

A flattened map is created using the following method:

```
MetadataMap MetadataMap::flatten() const {
    MetadataMap newmap;

    for (MetadataMap::const_iterator i = oldmap.begin();
         i != oldmap.end(); ++i) {
        MetadataMapFlattenVisitor v(newmap, i->first);
        boost::apply_visitor(v, i->second);
    }

    return newmap;
}
```

The MetadataMapFlattenVisitor is implemented thusly:

```
// Flatten MetadataMap vector values
struct MetadataMapFlattenVisitor : public boost::static_visitor<> {
    MetadataMap& map; // Map of flattened elements
    const MetadataMap::key_type& key; // Current key

    MetadataMapFlattenVisitor
        (MetadataMap& map,
         const MetadataMap::key_type& key):
        map(map), key(key) {}

    // Output a scalar value of arbitrary type.
    template <typename T>
    void operator() (const T& v) const {
        map.set(key, v);
    }

    // Output a vector value of arbitrary type.
    template <typename T>
    void operator() (const std::vector<T>& c) const {
        typename std::vector<T>::size_type idx = 1;
        for (typename std::vector<T>::const_iterator i = c.begin();
             i != c.end(); ++i, ++idx) {
            std::ostream os;
            os << key << " #" << idx;
            map.set(os.str(), *i);
        }
    }
};
```

The MetadataMapFlattenVisitor is derived from boost::static_visitor, and its templated operator method is specialized and expanded once for each type supported by the variant type used by the map. In the above example, two separate overloaded operators are provided, one for scalar values which is a simple copy, and one for vector values which splits the elements

into separate keys in the new map. The important part is the call to `apply_visitor()`, which takes as arguments the visitor object and the variant to apply it to.

This could be done with a large set of conditionals using `boost::get<T>(value)` for each supported type. The benefit of the `boost::static_visitor` approach is that it ensures that all the types are supported *at compile time*, and in effect results in the same code. If any types are not supported, the code will fail to compile.

Variant example: VariantPixelBuffer equality comparison

This example demonstrates the use of variants with a combinatorial expansion of types.

The `VariantPixelBuffer` class can contain `PixelBuffer` classes of various pixel types. Comparing for equality is only performed if the pixel types of the two objects are the same:

```
{
    VariantPixelBuffer a, b;
    if (a == b) {
        // Buffers are the same.
    }
}
```

This is implemented using an overloaded equality operator:

```
bool VariantPixelBuffer::operator ==
    (const VariantPixelBuffer& rhs) const
{
    return boost::apply_visitor(PBCompareVisitor(),
                                buffer, rhs.buffer);
}
```

As before, this is implemented in terms of a `boost::static_visitor`, but note that this time it is specialized for `bool`, meaning that the return type of `apply_visitor()` will also be `bool`, and the operator methods must also return this type.

```
struct PBCompareVisitor : public boost::static_visitor<bool> {
    template <typename T, typename U>
    bool operator() (const T& /* lhs */,
                    const U& /* rhs */) const {
        return false;
    }

    template <typename T>
    bool operator() (const T& lhs,
                    const T& rhs) const {
        return lhs && rhs && (*lhs == *rhs);
    }
};
```

Unlike the last example, the operator methods now have two arguments, both of which are variant types, and the `apply_visitor()` call is passed two variant objects in addition to the visitor object. This causes the templates to be expanded for all pairwise combinations of the possible types. When the types are not equal, the first templated operator is called, which always returns false. When the types are equal the second operator is called; this checks both operands are not null and then performs an equality comparison using the buffer contents. Given that all the operators are inline, we would hope that a good compiler would cause all the false cases to be optimized out after expansion.

Variant example: VariantPixelBuffer SFINAE

This example demonstrates the use of variants with SFINAE.

C++ has a concept known as Substitution Failure Is Not An Error (SFINAE), which refers to it not being an error for a candidate template to fail argument substitution during overload resolution. While this is in and of itself a fairly obscure language detail,

it enables overloading of a method not just on type, but different categories of type, for example integer and floating point types, signed and unsigned integer types, simple and complex types, or combinations of all of these. This is particularly useful when writing algorithms to process pixel data.

Use of SFINAE has been made accessible through the creation of `boost::enable_if` (`std::enable_if` in C++11), and *type traits* (type category checking classes such as `is_integer`). The following code is an example of how one might write a visitor for adapting an algorithm to separate integer, floating point, complex floating point and bitmask cases.

```
struct TypeCategoryVisitor : public boost::static_visitor<>
{
    typedef ::ome::bioformats::PixelProperties< ::ome::xml::model::enums::PixelType::BIT>::std_type bit_type;

    TypeCategoryVisitor()
    {}

    // Integer pixel types
    template <typename T>
    typename boost::enable_if_c<
        boost::is_integral<T>::value, void
    >::type
    operator() (ome::compat::shared_ptr< ::ome::bioformats::PixelBuffer<T> >& buf)
    {
        // Integer algorithm.
    }

    // Floating point pixel types
    template <typename T>
    typename boost::enable_if_c<
        boost::is_floating_point<T>::value, void
    >::type
    operator() (ome::compat::shared_ptr< ::ome::bioformats::PixelBuffer<T> >& buf)
    {
        // Floating point algorithm.
    }

    // Complex floating point pixel types
    template <typename T>
    typename boost::enable_if_c<
        boost::is_complex<T>::value, void
    >::type
    operator() (ome::compat::shared_ptr< ::ome::bioformats::PixelBuffer<T> >& buf)
    {
        // Complex floating point algorithm.
    }

    // BIT/bool pixel type. Note this is a simple overload since it is
    // a simple type, not a category of different types.
    void
    operator() (ome::compat::shared_ptr< ::ome::bioformats::PixelBuffer<bit_type> >& buf)
    {
        // Boolean algorithm.
    }
};
```

This visitor may be used with `apply_visitor()` in a similar manner to the previously demonstrated visitors.

`enable_if` has two parameters, the first being a conditional, the second being the return type (in this example, all the methods return `void`). If the conditional is true, then the type expands to the return type and the template is successfully substituted. If the conditional is false (types do not match), then the substitution fails and the template will not be used. Note that the conditional is itself a type, which can be confusing, since all this logic is driven by conditional template expansion.

Normal templates are specialized for a type. This approach allows specialization for different *categories* of type. Without this approach it would be necessary to write separate overloads for each individual type (each integer type, each floating point type, each complex type, etc.), even when the logic would be identical for e.g. the different integer types. This approach therefore removes the need for unnecessary code duplication, and the type traits checks make each type category explicit to the reader.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁶ or the [previous versions](#)³⁷ page to find documentation for the version you are using.

14.3 Tutorial

14.3.1 Metadata

Bio-Formats supports several different classes of metadata, from very basic information about the image dimensions and pixel type to detailed information about the acquisition hardware and experimental parameters. From simplest to most complex, these are:

Core metadata Basic information describing an individual 5D image (series), including dimension sizes, dimension order and pixel type

Original metadata Key-value pairs describing metadata from the original file format for the image. Two forms exist: global metadata for an entire dataset (image collection) and series metadata for an individual 5D image

Metadata store A container for all image metadata providing interfaces to get and set individual metadata values. This is a superset of the core and original metadata content (it can represent all values contained within the core and original metadata). It is an alternative representation of the OME-XML data model objects, and is used by the Bio-Formats reader and writer interfaces.

OME-XML data model objects The abstract OME-XML data model is realized as a collection of *model objects*. Classes are generated from the elements of the OME-XML data model schema, and a tree of the model objects acts as a representation of the OME data model which may be modified and manipulated. The model objects may be created from an OME-XML text document, and vice versa.

For the simplest cases of reading and writing image data, the core metadata interface will likely be sufficient. If specific individual parameters from the original file format are needed, then original metadata may also be useful. For more advanced processing and rendering, the metadata store should be the next source of information, for example to get information about the image scale, stage position, instrument setup including light sources, light paths, detectors etc., and access to plate/well information, regions of interest etc. Direct access to the OME-XML data model objects is an alternative to the metadata store, but is more difficult to use; certain modifications to the data model may only be made via direct access to the model objects, otherwise the higher-level metadata store interface should be preferred.

The header file `ome/bioformats/MetadataTools.h`³⁸ provides several convenience functions to work with and manipulate the various forms of metadata, including conversion of Core metadata to and from a metadata store.

Core metadata

Core metadata is accessible through the getter methods in the `FormatReader` interface. These operate on the *current* series, set using the `setSeries()` method. The `CoreMetadata` objects are also accessible directly using the `getCoreMetadataList` method. The `FormatReader` interface should be preferred; the objects themselves are more of an implementation detail at present.

```
void
readMetadata(const FormatReader& reader,
             std::ostream&      stream)
{
    // Get total number of images (series)
    dimension_size_type ic = reader.getSeriesCount();
    stream << "Image count: " << ic << '\n';

    // Loop over images
    for (dimension_size_type i = 0 ; i < ic; ++i)
    {
```

³⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷<http://www.openmicroscopy.org/site/support/legacy/>

³⁸http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/MetadataTools_8h_source.html

```

// Change the current series to this index
reader.setSeries(i);

// Print image dimensions (for this image index)
stream << "Dimensions for Image " << i << ':'
    << "\n\tX = " << reader.getSizeX()
    << "\n\tY = " << reader.getSizeY()
    << "\n\tZ = " << reader.getSizeZ()
    << "\n\tT = " << reader.getSizeT()
    << "\n\tC = " << reader.getSizeC()
    << "\n\tEffectiveC = " << reader.getEffectiveSizeC();
for (dimension_size_type channel = 0;
    channel < reader.getEffectiveSizeC();
    ++channel)
{
    stream << "\n\tChannel " << channel << ':'
        << "\n\t\tRGB = " << (reader.isRGB(channel) ? "true" : "false")
        << "\n\t\tRGBC = " << reader.getRGBChannelCount(channel);
}
stream << '\n';

// Get total number of planes (for this image index)
dimension_size_type pc = reader.getImageCount();
stream << "\tPlane count: " << pc << '\n';

// Loop over planes (for this image index)
for (dimension_size_type p = 0 ; p < pc; ++p)
{
    // Print plane position (for this image index and plane
    // index)
    ome::compat::array<dimension_size_type, 3> coords =
        reader.getZCTCoords(p);
    stream << "\tPosition of Plane " << p << ':'
        << "\n\t\tTheZ = " << coords[0]
        << "\n\t\tTheT = " << coords[2]
        << "\n\t\tTheC = " << coords[1]
        << '\n';
}
}
}

```

If implementing a reader, it is fairly typical to set the basic image metadata in `CoreMetadata` objects, and then use the `fillMetadata()` function in `ome/bioformats/MetadataTools.h`³⁹ to fill the reader's metadata store with this information, before filling the metadata store with additional (non-core) metadata as required. When writing an image, a metadata store is required in order to provide the writer with all the metadata needed to write an image. If the metadata store was not already obtained from a reader, `fillMetadata()` may also be used in this situation to create a suitable metadata store:

```

shared_ptr< ::ome::xml::meta::OMEXMLMetadata>
createMetadata()
{
    // OME-XML metadata store.
    shared_ptr< ::ome::xml::meta::OMEXMLMetadata> meta(make_shared< ::ome::xml::meta::OMEXMLMetadata>())

    // Create simple CoreMetadata and use this to set up the OME-XML
    // metadata. This is purely for convenience in this example; a
    // real writer would typically set up the OME-XML metadata from an
    // existing MetadataRetrieve instance or by hand.
    std::vector<shared_ptr<CoreMetadata> > seriesList;
    shared_ptr<CoreMetadata> core(make_shared<CoreMetadata>());
    core->sizeX = 512U;
    core->sizeY = 512U;
}

```

³⁹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/MetadataTools_8h_source.html

```

core->sizeC.clear(); // defaults to 1 channel with 1 subchannel; clear this
core->sizeC.push_back(3U); // replace with single RGB channel
core->pixelType = ome::xml::model::enums::PixelType::UINT16;
core->interleaved = false;
core->bitsPerPixel = 12U;
core->dimensionOrder = DimensionOrder::XYZTC;
seriesList.push_back(core);

fillMetadata(*meta, seriesList);

return meta;
}

```

Full example source: `metadata-formatreader.cpp`, `metadata-formatreader.cpp`

See also:

- [CoreMetadata](#)⁴⁰
- [FormatReader](#)⁴¹

Original metadata

Original metadata is stored in two forms: in a `MetadataMap` which is accessible through the `FormatReader` interface, which offers access to individual keys and the whole map for both global and series metadata. It is also accessible using the metadata store; original metadata is stored as an `XMLAnnotation`. The following example demonstrates access to the global and series metadata using the `FormatReader` interface to get access to the maps:

```

void
readOriginalMetadata(const FormatReader& reader,
                    std::ostream& stream)
{
    // Get total number of images (series)
    dimension_size_type ic = reader.getSeriesCount();
    stream << "Image count: " << ic << '\n';

    // Get global metadata
    const MetadataMap& global = reader.getGlobalMetadata();

    // Print global metadata
    stream << "Global metadata:\n" << global << '\n';

    // Loop over images
    for (dimension_size_type i = 0 ; i < ic; ++i)
    {
        // Change the current series to this index
        reader.setSeries(i);

        // Print series metadata
        const MetadataMap& series = reader.getSeriesMetadata();

        // Print image dimensions (for this image index)
        stream << "Metadata for Image " << i << ":\n"
              << series
              << '\n';
    }
}

```

⁴⁰http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1CoreMetadata.html

⁴¹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatReader.html

It would also be possible to use `getMetadataValue()` and `getSeriesMetadataValue()` to obtain values for individual keys. Note that the `MetadataMap` values can be scalar values or lists of scalar values; call the `flatten()` method to split the lists into separate key-value pairs with a numbered suffix.

Full example source: `metadata-formatreader.cpp`

See also:

- [MetadataMap](#)⁴²
- [FormatReader](#)⁴³
- [OriginalMetadataAnnotation](#)⁴⁴

Metadata store

Access to metadata is provided via the `MetadataStore` and `MetadataRetrieve` interfaces. These provide setters and getters, respectively, to store and retrieve metadata to and from an underlying abstract metadata store. The primary store is the `OMEXMLMetadata` which stores the metadata in OME-XML data model objects (see below), and implements both interfaces. However, other storage classes are available, and may be used to filter the stored metadata, combine different stores, or do nothing at all. Additional storage backends could also be implemented, for example to allow metadata retrieval from a relational database, or JSON/YAML.

When using `OMEXMLMetadata` the convenience function `createOMEXMLMetadata()` is the recommended method for creating a new instance and then filling it with the content from an OME-XML document. This is overloaded to allow the OME-XML to be obtained from various sources. For example, from a file:

```
// Create metadata directly from file
shared_ptr<meta::OMEXMLMetadata> filemeta(createOMEXMLMetadata(filename));
```

Alternatively from a DOM tree:

```
// XML platform (required by Xerces)
xml::Platform xmlplat;
// XML DOM tree containing parsed file content
xml::dom::Document inputdoc(xml::dom::createDocument(filename));
// Create metadata from DOM document
shared_ptr<meta::OMEXMLMetadata> dommeta(createOMEXMLMetadata(inputdoc));
```

The convenience function `getOMEXML()` may be used to reverse the process, i.e. obtain an OME-XML document from the store. Note the use of `convert()`. Only the `OMEXMLMetadata` class can dump an OME-XML document, therefore if the source of the data is another class implementing the `MetadataRetrieve` interface, the stored data will need to be copied into an `OMEXMLMetadata` instance first.

```
meta::OMEXMLMetadata *omexmlmeta = dynamic_cast<meta::OMEXMLMetadata *>(&meta);
shared_ptr<meta::OMEXMLMetadata> convertmeta;
if (!omexmlmeta)
{
    convertmeta = make_shared<meta::OMEXMLMetadata>();
    meta::convert(meta, *convertmeta);
    omexmlmeta = &*convertmeta;
}
// Get OME-XML text from metadata store (and validate it)
std::string omexml(getOMEXML(*omexmlmeta, true));
```

Conceptually, the metadata store contains lists of objects, accessed by index (insertion order). In the example below, `getImageCount()` method is used to find the number of images. This is then used to safely loop through each of the available images. Each of the `getPixelsSizeA()` methods takes the image index as its only argument. Internally, this is used to find the `Image`

⁴²http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1MetadataMap.html

⁴³http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatReader.html

⁴⁴http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1xml_1_1model_1_1OriginalMetadataAnnotation.html

model object for the specified index, and then call the `getSizeA()` method on that object and return the result. Since objects can contain other objects, some accessor methods require the use of more than one index. For example, an `Image` object can contain multiple `Plane` objects. Similar to the above example, there is a `getPlaneCount()` method, however since it is contained by an `Image` it has an additional image index argument to get the plane count for the specified image. Likewise its accessors such as `getPlaneTheZ()` take two arguments, the image index and the plane index. Internally, these indices will be used to find the `Image`, then the `Plane`, and then call `getTheZ()`. When using the `MetadataRetrieve` interface with an `OMEXMLMetadata` store, the methods are simply a shorthand for navigating through the tree of model objects.

```
void
queryMetadata(const meta::MetadataRetrieve& meta,
              const std::string&          state,
              std::ostream&               stream)
{
    // Get total number of images (series)
    index_type ic = meta.getImageCount();
    stream << "Image count: " << ic << '\n';

    // Loop over images
    for (index_type i = 0 ; i < ic; ++i)
    {
        // Print image dimensions (for this image index)
        stream << "Dimensions for Image " << i << ' ' << state << ':'
            << "\n\tX = " << meta.getPixelsSizeX(i)
            << "\n\tY = " << meta.getPixelsSizeY(i)
            << "\n\tZ = " << meta.getPixelsSizeZ(i)
            << "\n\tT = " << meta.getPixelsSizeT(i)
            << "\n\tC = " << meta.getPixelsSizeC(i)
            << '\n';

        // Get total number of planes (for this image index)
        index_type pc = meta.getPlaneCount(i);
        stream << "\tPlane count: " << pc << '\n';

        // Loop over planes (for this image index)
        for (index_type p = 0 ; p < pc; ++p)
        {
            // Print plane position (for this image index and plane
            // index)
            stream << "\tPosition of Plane " << p << ':'
                << "\n\t\tTheZ = " << meta.getPlaneTheZ(i, p)
                << "\n\t\tTheT = " << meta.getPlaneTheT(i, p)
                << "\n\t\tTheC = " << meta.getPlaneTheC(i, p)
                << '\n';
        }
    }
}
```

The methods for storing data using the `MetadataStore` interface are similar. The set methods use the same indices as the get methods, with the value to set as an additional initial argument. The following example demonstrates how to update dimension sizes for images in the store:

```
void
updateMetadata(meta::Metadata& meta)
{
    // Get total number of images (series)
    index_type ic = meta.getImageCount();

    // Loop over images
    for (index_type i = 0 ; i < ic; ++i)
    {
        // Change image dimensions (for this image index)
        meta.setPixelsSizeX(12, i);
        meta.setPixelsSizeY(24, i);
    }
}
```



```

        meta.setPixelsSizeZ(6, i);
        meta.setPixelsSizeT(30, i);
        meta.setPixelsSizeC(4, i);
    }
}

```

When adding new objects to the store, as opposed to updating existing ones, some additional considerations apply. An new object is added to the store if the object corresponding to an index does not exist and the index is the current object count (i.e. one past the end of the last valid index). Note that for data model objects with a `setID()` method, this method alone will trigger insertion and must be called first, before any other methods which modify the object. The following example demonstrates the addition of a new Image to the store, plus contained Plane objects.

```

void
addMetadata(metadata::Metadata& meta)
{
    // Get total number of images (series)
    index_type i = meta.getImageCount();

    // Size of Z, T and C dimensions
    index_type nz = 3;
    index_type nt = 1;
    index_type nc = 4;

    // Create new image; the image index is the same as the image
    // count, i.e. one past the end of the current limit; createID
    // creates a unique identifier for the image
    meta.setImageID(createID("Image", i), i);
    // Set Pixels identifier using createID and the same image index
    meta.setPixelsID(createID("Pixels", i), i);
    // Now set the dimension order, pixel type and dimension sizes for
    // this image, using the same image index
    meta.setPixelsDimensionOrder(model::enums::DimensionOrder::XYZTC, i);
    meta.setPixelsType(model::enums::PixelType::UINT8, i);
    meta.setPixelsSizeX(256, i);
    meta.setPixelsSizeY(256, i);
    meta.setPixelsSizeZ(nz, i);
    meta.setPixelsSizeT(nt, i);
    meta.setPixelsSizeC(nc, i);

    // Plane count
    index_type pc = nz * nc * nt;

    // Loop over planes
    for(index_type p = 0; p < pc; ++p)
    {
        // Get the Z, T and C coordinate for this plane index
        array<dimension_size_type, 3> coord =
            getZCTCoords("XYZTC", nz, nc, nt, pc, p);

        // Set the plane position using the image index and plane
        // index to reference the correct plane
        meta.setPlaneTheZ(coord[0], i, p);
        meta.setPlaneTheT(coord[2], i, p);
        meta.setPlaneTheC(coord[1], i, p);
    }

    // Add MetadataOnly to Pixels since this is an example without
    // TiffData or BinData
    metadata::OMEXMLMetadata *omexmlmeta = dynamic_cast<metadata::OMEXMLMetadata *>(&meta);
    if (omexmlmeta)
        addMetadataOnly(*omexmlmeta, i);
}

```

Full example source: `metadata-io.cpp`

See also:

- [Metadata classes](#)⁴⁵
- [createID](#)⁴⁶
- [createOMEXMLMetadata](#)⁴⁷
- [getOMEXML](#)⁴⁸

OME-XML data model objects

The data model objects are not typically used directly, but are created, modified and queried using the `Metadata` interfaces (above), so in practice these examples should not be needed.

To create a tree of OME-XML data model objects from OME-XML text:

```
// XML DOM tree containing parsed file content
xml::dom::Document inputdoc(xml::dom::createDocument(filename));
// OME Model (needed only during parsing to track model object references)
model::detail::OMEModel model;
// OME Model root object
shared_ptr<model::OME> modelroot(make_shared<model::OME>());
// Fill OME model object tree from XML DOM tree
modelroot->update(inputdoc.getDocumentElement(), model);
```

In this example, the OME-XML text is read from a file into a DOM tree. This could have been read directly from a string or stream if the source was not a file. The DOM tree is then processed using the OME root object's `update()` method, which uses the data from the DOM tree elements to create a tree of corresponding model objects contained by the root object.

To reverse the process, taking a tree of OME-XML model objects and converting them back of OME-XML text:

```
// Schema version to use
const std::string schema("http://www.openmicroscopy.org/Schemas/OME/2013-06");
// XML DOM tree (initially containing an empty OME root element)
xml::dom::Document outputdoc(xml::dom::createEmptyDocument(schema, "OME"));
// Fill output DOM document from OME-XML model
modelroot->asXMLElement(outputdoc);
// Dump DOM tree as text to stream
xml::dom::writeDocument(outputdoc, stream);
```

Here, the OME root object's `asXMLElement()` method is used to copy the data from the OME root object and its children into an XML DOM tree. The DOM tree is then converted to text for output.

Full example source: `model-io.cpp`

See also:

- [OME model classes](#)⁴⁹
- [OME](#)⁵⁰

14.3.2 Pixel data

The Bio-Formats Java implementation stores and passes pixel values in a raw `byte` array. Due to limitations with C++ array passing, this was not possible for the C++ implementation. While a vector or other container could have been used, several problems

⁴⁵http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaceome_1_1xml_1_1meta.html

⁴⁶http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaceome_1_1bioformats.html#ab3bf80ec03bcf20b199ce2761d48fe01

⁴⁷http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaceome_1_1bioformats.html#ae61f12958973765e8328348874a85731

⁴⁸http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaceome_1_1bioformats.html#a32e5424991ce09b857ddc0d5be37c4f1

⁴⁹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaceome_1_1xml_1_1model.html

⁵⁰http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1xml_1_1model_1_1OME.html

remain. The type and endianness of the data in the raw bytes is not known, and the dimension ordering and dimension extents are also unknown, which imposes a significant burden on the programmer to correctly process the data. The C++ implementation provides two types to solve these problems.

The `PixelBuffer` class is a container of pixel data. It is a template class, templated on the pixel type in use. The class contains the order of the dimensions, and the size of each dimension, making it possible to process pixel data without need for externally-provided metadata to describe its structure. This class may be used to contain and process pixel data of a specific pixel type. Internally, the pixel data is contained within a `boost::multi_array` as a 9D hyper-volume, though its usage in this release of Bio-Formats is limited to 5D. The class can either contain its own memory allocation for pixel data, or it can reference memory allocated or mapped externally, allowing use with memory-mapped data, for example.

In many situations, it is desirable to work with arbitrary pixel types, or at least the set of pixel types defined in the OME data model in its `PixelType` enumeration. The `VariantPixelBuffer` fulfills this need, using `boost::variant` to allow it to contain a `PixelBuffer` specialized for any of the pixel types in the OME data model. This is used to allow transfer and processing of any supported pixel type, for example by the `FormatReader` class' `getLookupTable()` and `openBytes()` methods, and the corresponding `FormatWriter` class' `setLookupTable()` and `saveBytes()` methods.

An additional problem with supporting many different pixel types is that each operation upon the pixel data, for example for display or analysis, may require implementing separately for each pixel type. This imposes a significant testing and maintenance burden. `VariantPixelBuffer` solves this problem through use of `boost::apply_visitor()` and `boost::static_visitor`, which allow algorithms to be defined in a template and compiled for each pixel type. They also allow algorithms to be specialized for different classes of pixel type, for example signed vs. unsigned, integer vs. floating point, or simple vs. complex, or special-cased per type e.g. for bitmasks. When `boost::apply_visitor()` is called with a specified algorithm and `VariantPixelBuffer` object, it will select the matching algorithm for the pixel type contained within the buffer, and then invoke it on the buffer. This permits the programmer to support arbitrary pixel types without creating a maintenance nightmare, and without unnecessary code duplication.

The 9D pixel buffer makes a distinction between the logical dimension order (used by the API) and the storage order (the layout of the pixel data in memory). The logical order is defined by the values in the `Dimensions`⁵¹ enum. The storage order is specified by the programmer when creating a pixel buffer.

The following example shows creation of a pixel buffer with a defined size, and `default storage order`⁵²:

```
// Language type for FLOAT pixel data
typedef PixelProperties<PixelType::FLOAT>::std_type float_pixel_type;
// Create PixelBuffer for floating point data
// X=512 Y=512 Z=16 T=1 C=3 S/z/t/c=1
PixelBuffer<float_pixel_type> buffer
    (boost::extents[512][512][16][1][3][1][1][1][1], PixelType::FLOAT);
```

The storage order may be set explicitly. The order may be created by hand, or with a `helper function`⁵³. While the helper function is limited to supporting the ordering defined by the data model, specifying the order by hand allows additional flexibility. Manual ordering may be used to allow the indexing for individual dimensions to run backward rather than forward, which is useful if the Y-axis requires inverting, for example. The following example shows creation of two pixel buffers with defined storage order using the helper function:

```
// Language type for UINT16 pixel data
typedef PixelProperties<PixelType::UINT16>::std_type uint16_pixel_type;
// Storage order is XYSTZztc; subchannels are not interleaved
// ("planar") after XY; lowercase letters are unused Modulo
// dimensions
PixelBufferBase::storage_order_type order1
    (PixelBufferBase::make_storage_order(DimensionOrder::XYCTZ, false));
// Create PixelBuffer for unsigned 16-bit data with specified
// storage order
// X=512 Y=512 Z=16 T=1 C=3 S/z/t/c=1
PixelBuffer<uint16_pixel_type> buffer1
    (boost::extents[512][512][16][1][3][1][1][1][1],
     PixelType::UINT16,
```

⁵¹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespacesome_1_1bioformats.html#ad9ebb405a4815c189fa788325f68a91a

⁵²http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1PixelBufferBase.html#a419ad49f2ea90937a57b81a74b56380b

⁵³http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1PixelBufferBase.html#ac7e922610bf561f311d13c3d7fcaeb69

```

ome::bioformats::ENDIAN_NATIVE,
order1);

// Language type for INT8 pixel data
typedef PixelProperties<PixelType::INT8>::std_type int8_pixel_type;
// Storage order is SXYZCTztc; subchannels are interleaved
// ("chunky") before XY; lowercase letters are unused Modulo
// dimensions
PixelBufferBase::storage_order_type order2
(PixelBufferBase::make_storage_order(DimensionOrder::XYZCT, true));
// Create PixelBuffer for signed 8-bit RGB data with specified storage
// order
// X=1024 Y=1024 Z=1 T=1 C=1 S=3 z/t/c=1
PixelBuffer<int8_pixel_type> buffer2
(boost::extents[1024][1024][1][1][1][3][1][1][1],
 PixelType::INT8,
 ome::bioformats::ENDIAN_NATIVE,
 order2);

```

Note that the logical order of the dimension extents is unchanged.

In practice, it is unlikely that you will need to create any `PixelBuffer` objects directly. The `FormatReader` and `FormatWriter` interfaces use `VariantPixelBuffer` objects, and in the case of the reader interface the `getLookupTable()` and `openBytes()` methods can be passed a default-constructed `VariantPixelBuffer` and it will be set up automatically, changing the image dimensions, dimension order and pixel type to match the data being fetched, if the size, order and type do not match. For example, to read all pixel data in an image using `openBytes()`:

```

void
readPixelData(const FormatReader& reader,
              std::ostream&      stream)
{
    // Get total number of images (series)
    dimension_size_type ic = reader.getSeriesCount();
    stream << "Image count: " << ic << '\n';

    // Loop over images
    for (dimension_size_type i = 0 ; i < ic; ++i)
    {
        // Change the current series to this index
        reader.setSeries(i);

        // Get total number of planes (for this image index)
        dimension_size_type pc = reader.getImageCount();
        stream << "\tPlane count: " << pc << '\n';

        // Pixel buffer
        VariantPixelBuffer buf;

        // Loop over planes (for this image index)
        for (dimension_size_type p = 0 ; p < pc; ++p)
        {
            // Read the entire plane into the pixel buffer.
            reader.openBytes(p, buf);

            // If this wasn't an example, we would do something
            // exciting with the pixel data here.
            stream << "Pixel data for Image " << i
                  << " Plane " << p << " contains "
                  << buf.num_elements() << " pixels\n";
        }
    }
}

```

To perform the reverse process, writing pixel data with `saveBytes()`:

```

void
writePixelData(FormatWriter& writer,
               std::ostream& stream)
{
    // Total number of images (series)
    dimension_size_type ic = 1;
    stream << "Image count: " << ic << '\n';

    // Loop over images
    for (dimension_size_type i = 0 ; i < ic; ++i)
    {
        // Change the current series to this index
        writer.setSeries(i);

        // Total number of planes.
        dimension_size_type pc = 1;
        stream << "\tPlane count: " << pc << '\n';

        // Loop over planes (for this image index)
        for (dimension_size_type p = 0 ; p < pc; ++p)
        {
            // Pixel buffer; size 512 × 512 with 3 subchannels of type
            // uint16_t. It uses the native endianness and has a
            // storage order of XYZTC without interleaving
            // (subchannels are planar).
            shared_ptr<PixelBuffer<PixelProperties<PixelType::UINT16>::std_type> >
                buffer(make_shared<PixelBuffer<PixelProperties<PixelType::UINT16>::std_type> >
                    (boost::extents[512][512][1][1][1][3][1][1][1],
                     PixelType::UINT16, ome::bioformats::ENDIAN_NATIVE,
                     PixelBufferBase::make_storage_order(DimensionOrder::XYZTC, false)));

            // Fill each subchannel with a different intensity ramp in
            // the 12-bit range. In a real program, the pixel data
            // would typically be obtained from data acquisition or
            // another image.
            for (dimension_size_type x = 0; x < 512; ++x)
                for (dimension_size_type y = 0; y < 512; ++y)
                {
                    PixelBufferBase::indices_type idx;
                    std::fill(idx.begin(), idx.end(), 0);
                    idx[DIM_SPATIAL_X] = x;
                    idx[DIM_SPATIAL_Y] = y;

                    idx[DIM_SUBCHANNEL] = 0;
                    buffer->at(idx) = (static_cast<float>(x) / 512.0f) * 4096.0f;
                    idx[DIM_SUBCHANNEL] = 1;
                    buffer->at(idx) = (static_cast<float>(y) / 512.0f) * 4096.0f;
                    idx[DIM_SUBCHANNEL] = 2;
                    buffer->at(idx) = (static_cast<float>(x+y) / 1024.0f) * 4096.0f;
                }

            VariantPixelBuffer vbuffer(buffer);
            stream << "PixelBuffer PixelType is " << buffer->pixelType() << '\n';
            stream << "VariantPixelBuffer PixelType is " << vbuffer.pixelType() << '\n';
            stream << std::flush;

            // Write the the entire pixel buffer to the plane.
            writer.saveBytes(p, vbuffer);

            stream << "Wrote " << buffer->num_elements() << ' ' << buffer->pixelType() << " pixels\n";
        }
    }
}

```

Both buffer classes provide access to the pixel data so that it may be accessed, manipulated and passed elsewhere. The `PixelBuffer` class provides an `at` method. This allows access to individual pixel values using a 9D coordinate:

```
// Set all pixel values for Z=2 and C=1 to 0.5
// 9D index, default values to zero if unused
PixelBuffer<float_pixel_type>::indices_type idx;
// Set Z and C indices
idx[ome::bioformats::DIM_SPATIAL_Z] = 2;
idx[ome::bioformats::DIM_CHANNEL] = 1;
idx[ome::bioformats::DIM_TEMPORAL_T] =
    idx[ome::bioformats::DIM_SUBCHANNEL] =
    idx[ome::bioformats::DIM_MODULO_Z] =
    idx[ome::bioformats::DIM_MODULO_T] =
    idx[ome::bioformats::DIM_MODULO_C] = 0;

for (uint16_t x = 0; x < 512; ++x)
{
    idx[ome::bioformats::DIM_SPATIAL_X] = x;
    for (uint16_t y = 0; y < 512; ++y)
    {
        idx[ome::bioformats::DIM_SPATIAL_Y] = y;
        buffer.at(idx) = 0.5f;
    }
}
```

Conceptually, this is the same as using an index for a normal 1D array, but extended to use an array of nine indices for each of the nine dimensions, in the logical storage order. The `VariantPixelBuffer` does not provide an `at` method for efficiency reasons. Instead, visitors should be used for the processing of bulk pixel data. For example, this is one way the minimum and maximum pixel values could be obtained:

```
// Visitor to compute min and max pixel value for pixel buffer of
// any pixel type
// The static_visitor specialization is the required return type of
// the operator() methods and boost::apply_visitor()
struct MinMaxVisitor : public boost::static_visitor<std::pair<double, double> >
{
    // The min and max values will be returned in a pair. double is
    // used since it can contain the value for any pixel type
    typedef std::pair<double, double> result_type;

    // Get min and max for any non-complex pixel type
    template<typename T>
    result_type
    operator() (const T& v)
    {
        typedef typename T::element_type::value_type value_type;

        value_type *min = std::min_element(v->data(),
                                           v->data() + v->num_elements());
        value_type *max = std::max_element(v->data(),
                                           v->data() + v->num_elements());

        return result_type(static_cast<double>(*min),
                           static_cast<double>(*max));
    }
}

// Less than comparison for real part of complex numbers
template <typename T>
static bool
```

```

complex_real_less(const T& lhs, const T& rhs)
{
    return std::real(lhs) < std::real(rhs);
}

// Greater than comparison for real part of complex numbers
template <typename T>
static bool
complex_real_greater(const T& lhs, const T& rhs)
{
    return std::real(lhs) > std::real(rhs);
}

// Get min and max for complex pixel types (COMPLEX and
// DOUBLECOMPLEX)
// This is the same as for simple pixel types, except for the
// addition of custom comparison functions and conversion of the
// result to the real part.
template <typename T>
typename boost::enable_if_c<
    boost::is_complex<T>::value, result_type
>::type
operator() (const ome::compat::shared_ptr<PixelBuffer<T> >& v)
{
    typedef T value_type;

    value_type *min = std::min_element(v->data(),
                                       v->data() + v->num_elements(),
                                       complex_real_less<T>);
    value_type *max = std::max_element(v->data(),
                                       v->data() + v->num_elements(),
                                       complex_real_greater<T>);

    return result_type(static_cast<double>(std::real(*min)),
                       static_cast<double>(std::real(*max)));
}
};

void
applyVariant()
{
    // Make variant buffer (int32, 16x16 single plane)
    VariantPixelBuffer variant(boost::extents[16][16][1][1][1][1][1][1][1][1],
                              PixelType::INT32);

    // Get buffer size
    VariantPixelBuffer::size_type size = variant.num_elements();
    // Create sample random-ish data
    std::vector<int32_t> vec;
    for (VariantPixelBuffer::size_type i = 0; i < size; ++i)
    {
        int32_t val = static_cast<int32_t>(i + 42);
        vec.push_back(val);
    }
    std::random_shuffle(vec.begin(), vec.end());
    // Assign sample data to buffer.
    variant.assign(vec.begin(), vec.end());

    // Create and apply visitor
    MinMaxVisitor visitor;
    MinMaxVisitor::result_type result = boost::apply_visitor(visitor, variant.vbuffer());

    std::cout << "Min is " << result.first
               << ", max is " << result.second << '\n';
}

```

This example demonstrates several features:

- The visitor operators can return values to the caller (for more complex algorithms, the visitor class could use member variables and additional methods)
- The operator is expanded once for each pixel type
- The operators can be special-cased for individual pixel types; here we use the [SFINAE rule](#)⁵⁴ to implement a specialization for an entire category of pixel types (complex numbers), but standard function overloading and templates will also work for more common cases
- Pixel data can be assigned to the buffer with a single `assign()` call.

The Bio-Formats source uses pixel buffer visitors for several purposes, for example to load pixel data into OpenGL textures, which automatically handles pixel format conversion and repacking of pixel data as needed.

While the pixel buffers may appear complex, they do permit the Bio-Formats library to support all pixel types with relative ease, and it will allow your applications to also handle multiple pixel types by writing your own visitors. Assignment of one buffer to another will also repack the pixel data if they use different storage ordering (i.e. the logical ordering is used for the copy), which can be useful if you need the pixel data in a defined ordering.

If all you want is access to the raw data, as in the Java API, you are not required to use the above features. Simply use the `data()` method on the buffer to get a pointer to the raw data. Note that you will need to multiply the buffer size obtained with `num_elements()` by the size of the pixel type (use `bytesPerPixel()` or `sizeof()` on the buffer `value_type`).

Alternatively, it is also possible to access the underlying `boost::multi_array` using the `array()` method, if you need access to functionality not wrapped by `PixelBuffer`.

Full example source: `pixeldata.cpp`

See also:

- [PixelType](#)⁵⁵
- [PixelBuffer](#)⁵⁶
- [VariantPixelBuffer](#)⁵⁷
- [FormatReader::getLookupTable](#)⁵⁸
- [FormatReader::openBytes](#)⁵⁹
- [FormatWriter::setLookupTable](#)⁶⁰
- [FormatWriter::saveBytes](#)⁶¹

14.3.3 Reading images

Image reading is performed using the `FormatReader` interface. This is an abstract reader interface implemented by file-format-specific reader classes. Examples of readers include `TIFFReader`, which implements reading of Baseline TIFF (optionally with additional ImageJ metadata), and `OMETIFFReader` which implements reading of OME-TIFF (TIFF with OME-XML metadata).

Using a reader involves these steps:

1. Create a reader instance.
2. Set options to control reader behavior.
3. Call `setId()` to specify the image file to read.
4. Retrieve desired metadata and pixel data.
5. Close the reader.

⁵⁴<http://en.cppreference.com/w/cpp/language/sfinae>

⁵⁵http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1xml_1_1model_1_1enums_1_1PixelType.html

⁵⁶http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1PixelBuffer.html

⁵⁷http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1VariantPixelBuffer.html

⁵⁸http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatReader.html#a75ad99e400c31ccb9e52da8aeb991b73

⁵⁹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatReader.html#aae4d2b9475b078f7ba2378ed505e864c

⁶⁰http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatWriter.html#a00ae3dc46c205e64f782c7b6f47bd5ab

⁶¹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatWriter.html#ad1e8b427214f7cfd19ce2251d38e24f5

These steps are illustrated in this example:

```
// Create TIFF reader
shared_ptr<FormatReader> reader(make_shared<TIFFReader>());

// Set reader options before opening a file
reader->setMetadataFiltered(false);
reader->setGroupFiles(true);

// Open the file
reader->setId(filename);

// Display series core metadata
readMetadata(*reader, std::cout);

// Display global and series original metadata
readOriginalMetadata(*reader, std::cout);

// Read pixel data
readPixelData(*reader, std::cout);

// Explicitly close reader
reader->close();
```

Here we create a reader to read TIFF files, set two options (metadata filtering and file grouping), and then call `setId()`. At this point the reader has been set up and initialized, and we can then read metadata and pixel data, which we covered in the preceding sections. You might like to combine this example with the `MinMaxVisitor` example to make it display the minimum and maximum values for each plane in an image; if you try running the example with TIFF images of different pixel types, it will transparently adapt to any supported pixel type.

Note: Reader option-setting methods may only be called *before* `setId()`. Reader state changing and querying methods such as `setSeries()` and `getSeries()`, metadata retrieval and pixel data retrieval methods may only be called *after* `setId()`. If these constraints are violated, a `FormatException` will be thrown.

Full example source: `metadata-formatreader.cpp`

See also:

- [FormatReader](#)⁶²
- [TIFFReader](#)⁶³
- [OMETIFFReader](#)⁶⁴

14.3.4 Writing images

Image writing is performed using the `FormatWriter` interface. This is an abstract writer interface implemented by file-format-specific writer classes. Examples of writers include `MinimalTIFFWriter`, which implements writing of Baseline TIFF and `OMETIFFWriter` which implements writing of OME-TIFF (TIFF with OME-XML metadata).

Using a writer involves these steps:

1. Create a writer instance.
2. Set metadata store to use.
3. Set options to control writer behavior.
4. Call `setId()` to specify the image file to write.
5. Store pixel data for each plane of each image in the specified dimension order.
6. Close the writer.

⁶²http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatReader.html

⁶³http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1in_1_1TIFFReader.html

⁶⁴http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1in_1_1OMETIFFReader.html

These steps are illustrated in this example:

```
// Create metadata for the file to be written.
shared_ptr< ::ome::xml::meta::MetadataRetrieve> meta(createMetadata());

// Create TIFF writer
shared_ptr<FormatWriter> writer(make_shared<OMETIFFWriter>());

// Set writer options before opening a file
writer->setMetadataRetrieve(meta);
writer->setInterleaved(false);

// Open the file
writer->setId(filename);

// Write pixel data
writePixelData(*writer, std::cout);

// Explicitly close writer
writer->close();
```

Here we create a writer to write OME-TIFF files, set the metadata store using metadata we create, then set a writer option (sample interleaving), and then call `setId()`. At this point the writer has been set up and initialized, and we can then write the pixel data, which we covered in the preceding sections. Finally we call `close()` to flush all data.

Note: Metadata store setting and writer option-setting methods may only be called *before* `setId()`. Writer state changing and querying methods such as `setSeries()` and `getSeries()`, and pixel data storage methods may only be called *after* `setId()`. If these constraints are violated, a `FormatException` will be thrown.

Note: `close()` should be called explicitly to catch any errors. While this will be called by the destructor, the destructor can't throw exceptions and any errors will be silently ignored.

Full example source: `metadata-formatwriter.cpp`

See also:

- [FormatWriter](#)⁶⁵
- [TIFFWriter](#)⁶⁶
- [OMETIFFWriter](#)⁶⁷

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁸ or the [previous versions](#)⁶⁹ page to find documentation for the version you are using.

14.4 Environment

The Bio-Formats libraries and programs are configured and built to use a set of search paths for different components. It should not be necessary to override these defaults. The **bf** command will be able to autodetect the installation directory configure paths on most platforms, and the Bio-Formats libraries are also able to determine the paths on most platforms so long as the library search path is configured correctly. However, the following environment variables may be used to override the defaults if this proves necessary:

⁶⁵http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatWriter.html

⁶⁶http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1out_1_1MinimalTIFFWriter.html

⁶⁷http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1out_1_1OMETIFFWriter.html

⁶⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁹<http://www.openmicroscopy.org/site/support/legacy/>

14.4.1 Installation root

BIOFORMATS_HOME

The root of the installation (if applicable). Setting this will allow the installation to be used in a location other than the one configured. It will also default all the following variables unless they are explicitly overridden individually. This is not useful if an absolute installation path has been configured (e.g. if using `/usr/local`).

14.4.2 Basic paths

These may be shared with other packages if configured to do so (e.g. if using `/usr/local`). See [GNUInstallDirs](#)⁷⁰ for more details. Not all of these paths are currently used, but may be used in the future.

BIOFORMATS_BINDIR Programs invocable directly by an end user (on the default `PATH`)

BIOFORMATS_SBINDIR Programs invocable directly by an end user or admin (not on the default `PATH`)

BIOFORMATS_SYSLIBEXECDIR Programs not typically invoked directly (called internally by the Bio-Formats tools and libraries as needed)

BIOFORMATS_SYSCONFDIR Configuration files

BIOFORMATS_SHAREDSTATEDIR Shared state

BIOFORMATS_LOCALSTATEDIR Local state

BIOFORMATS_LIBDIR Libraries

BIOFORMATS_INCLUDEDIR C and C++ include files

BIOFORMATS_OLDINCLUDEDIR C and C++ include files (system)

BIOFORMATS_DATAROOTDIR Read-only architecture-independent data (root)

BIOFORMATS_SYSDATADIR Read-only architecture-independent data

BIOFORMATS_INFODIR GNU Info documentation files

BIOFORMATS_LOCALEDIR Locale data

BIOFORMATS_MANDIR Manual pages

BIOFORMATS_DOCDIR Documentation files

14.4.3 Bio-Formats package-specific paths

These are used only by Bio-Formats and are not shared with other packages. They are all subdirectories under the basic paths, above.

BIOFORMATS_DATADIR Bio-Formats data files

BIOFORMATS_ICONDIR Bio-Formats icons

BIOFORMATS_LIBEXECDIR Bio-Formats program executables

BIOFORMATS_SCHEMADIR Bio-Formats OME-XML model schemas

BIOFORMATS_TRANSFORMDIR Bio-Formats OME-XML model transforms

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷¹ or the [previous versions](#)⁷² page to find documentation for the version you are using.

⁷⁰<http://www.cmake.org/cmake/help/v3.0/module/GNUInstallDirs.html>

⁷¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷²<http://www.openmicroscopy.org/site/support/legacy/>

14.5 bf-test

14.5.1 Synopsis

bf-test command [*options*]

14.5.2 Description

bf-test is a front end for running the Bio-Formats (C++) command-line tools.

This takes care of setting up the environment to ensure that all needed libraries, programs and data files are made available. It is of course possible to run the tools directly if desired.

14.5.3 Options

- h, --help**
Show this manual page.
- u, --usage**
Show usage information.
- V, --version**
Print version information.

14.5.4 Commands

Commonly-used commands are:

info (or showinf) Display and validate image metadata

view (or glview) View image pixel data

14.5.5 See also

Environment, bf-test info, bf-test view.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](http://www.openmicroscopy.org/site/support/bio-formats5.0/)⁷³ or the [previous versions](http://www.openmicroscopy.org/site/support/legacy/)⁷⁴ page to find documentation for the version you are using.

14.6 bf-test info

14.6.1 Synopsis

bf-test info [*options*] *file*

14.6.2 Description

bf-test info displays the metadata for an image file, including the *core* and *original* metadata, and can optionally display and validate the *OME-XML* metadata.

Note: Viewing is currently restricted to the first series of an OME-TIFF file using the 2013-06 schema. Future releases will extend this to multiple series, all schema versions and additional file formats.

⁷³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁴<http://www.openmicroscopy.org/site/support/legacy/>

14.6.3 Options

- h, --help**
Show this manual page.
- u, --usage**
Show usage summary.
- V, --version**
Print version information.
- debug**
Show debug output.
- q, --quiet**
Show less output.
- v, --verbose**
Show more output.
- format=reader**
Use the specified format reader (UNIMPLEMENTED).
- flat**
Flatten subresolutions.
- no-flat (default)**
Do not flatten subresolutions.
- merge**
Combine separate channels into an RGB image (UNIMPLEMENTED).
- no-merge**
Do not combine separate channels into an RGB image (UNIMPLEMENTED) (default).
- group**
Group files in multi-file datasets into a single dataset.
- no-group**
files in multi-file datasets are not into a single dataset (default).
- stitch**
Group files with similar names (UNIMPLEMENTED).
- no-stitch**
Do not group files with similar names (UNIMPLEMENTED) (default).
- separate**
Separate an RGB image into separate channels (UNIMPLEMENTED).
- no-separate**
Do not separate an RGB image into separate channels (UNIMPLEMENTED) (default).
- series=n**
Use the specified series (UNIMPLEMENTED).
- resolution=n**
Use the specified sub-resolution (only if not flattened with `--flat`) (UNIMPLEMENTED).
- input-order=XY [ZTC]**
Override the dimension input order (UNIMPLEMENTED).
- output-order=XY [ZTC]**
Override the dimension output order (UNIMPLEMENTED).
- core**
Display core metadata (default).
- no-core**
Do not display core metadata.

--orig
Display original format-specific global and series metadata (default).

--no-orig
Do not display original format-specific global and series metadata.

--filter
Filter original format-specific global and series metadata.

--no-filter
Do not filter original format-specific global and series metadata (default).

--omexml
Display OME-XML metadata.

--no-omexml
Do not display OME-XML metadata (default).

--validate
Validate OME-XML metadata (default). Note this will only have an effect if `--omexml` is used.

--no-validate
Do not validate OME-XML metadata.

--sa
Display structured annotations (default) (UNIMPLEMENTED).

--no-sa
Do not display structured annotations.

--used
Display used files (default).

--no-used
Do not display used files.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁷⁵](#) or the [previous versions⁷⁶](#) page to find documentation for the version you are using.

14.7 bf-test view

14.7.1 Synopsis

bf-test view [*options*] *file*

14.7.2 Description

bf-test view renders the pixel data of an image file using OpenGL.

Open an image using *File* → *Open*.

Note: Viewing is currently restricted to the first series of an OME-TIFF file using the 2013-06 schema. Future releases will extend this to multiple series, all schema versions and additional file formats.

Note: The viewer currently supports viewing of multi-dimensional greyscale planes; RGB images are not yet supported. This will be rectified in a future update.

⁷⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁶<http://www.openmicroscopy.org/site/support/legacy/>

14.7.3 Navigation

The Navigation dock allows navigation between the constituent planes of an image. The Plane slider allows the absolute plane number to be changed, while individual Z, T, C sliders permit the Z slice, timepoint or channel to be changed, respectively. These sliders will only be available for images using these dimensions. Additional ModuloZ, ModuloT and ModuloC sliders may be present for images with Modulo annotations, for example with certain FLIM datasets.

14.7.4 Rendering

The Rendering dock allows the rendering settings to be adjusted. This is currently limited to Min and Max sliders to specify the lower and upper bounds of the display range for linear contrast adjustment. This range is used to render with a HiLo lookup table.

Note: The rendering settings will be improved in a future update to allow alternate lookup tables and per-channel rendering settings.

14.7.5 2D Camera

The view may be zoomed, panned and rotated. Select the desired operation using *View → Zoom*, *View → Pan* or *View → Rotate*, or use the corresponding toolbar icon.

zoom Press and hold the first mouse button anywhere in the image view, then drag up or down to zoom out or zoom in, respectively.

pam Press and hold the first mouse button anywhere in the image view, then drag to move the image.

rotate Press and hold the first mouse button anywhere in the image view, then drag up or down to rotate the image counterclockwise or clockwise, respectively.

14.7.6 Environment

BIOFORMATS_OPENGL_DEBUG If set (to any value), create an OpenGL debugging context and verbosely log all OpenGL activity

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Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](#) or the [previous versions²](#) page to find documentation for the version you are using.

15.1 Testing code changes

15.1.1 Automated tests

At the bottom of many commit messages in <https://github.com/openmicroscopy/bioformats>, you will find a few lines similar to this:

To test, please run:

```
ant -Dtestng.directory=$DATA/metamorph test-automated
```

This shows the command(s) necessary to run automated tests against the files likely to be affected by that commit. If you want to run these tests, you will need to do the following:

Clone `bioformats.git` and checkout the appropriate branch (by following the directions on the [Git usage³](#) page). Run this command to build all of the JAR files:

```
$ ant clean jars
```

Switch to the test-suite component:

```
$ cd components/test-suite
```

Run the tests, where `$DATA` is the path to the full data repository:

```
$ ant -Dtestng.directory=$DATA/metamorph test-automated
```

On Windows, the arguments to the test command must be quoted:

```
> ant "-Dtestng.directory=$DATA\metamorph" test-automated
```

By default, 512 MB of memory are allocated to the JVM. You can increase this by adding the `'-Dtestng.memory=XXXm'` option. You should now see output similar to this:

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

³<http://www.openmicroscopy.org/site/support/contributing/using-git.html>


```

Buildfile: build.xml

init-title:
    [echo] ===== bio-formats-testing-framework =====

init-timestamp:

release-version:

init-manifest-cp:

init:

copy-source:

compile:

test-automated:
    [testng] [Parser] Running:
    [testng]   Bio-Formats software test suite
    [testng]
    [testng] Scanning for files...
    [testng] Building list of tests...
    [testng] Ready to test 490 files
    [testng] .....

```

and then eventually:

```

    [testng] =====
    [testng] Bio-Formats software test suite
    [testng] Total tests run: 19110, Failures: 0, Skips: 0
    [testng] =====
    [testng]

BUILD SUCCESSFUL
Total time: 16 minutes 42 seconds

```

Each of the dots represents a single passed test; a ‘-’ is a skipped test, and an ‘F’ is a failed test. This is mostly just for your amusement if you happen to be staring at the console while the tests run, as a more detailed report is logged to `bio-formats-software-test-$DATE.log` (where “*\$DATE*” is the date on which the tests started in “yyyy-MM-dd_hh-mm-ss” format).

If Ant reports that the build was successful, then there is nothing that you need to do. Otherwise, it is helpful if you can provide the command, branch name, number of failures at the bottom of the Ant output, and the `bio-formats-software-test-*.log` file.

15.1.2 MATLAB tests

Tests for the Bio-Formats MATLAB toolbox are written using the xunit framework and are located under `components/formats-gpl/test/matlab`⁴.

To run these tests, you will need to download or clone `matlab-xunit`⁵, a xUnit framework with JUnit-compatible XML output. Then add this package together with the Bio-Formats MATLAB to your MATLAB path:

```

% Add the matlab-xunit toolbox to the MATLAB path
addpath('/path/to/matlab-xunit');
% Add the Bio-Formats MATLAB source to the MATLAB path
% For developers working against the source code
addpath('/path/to/bioformats/components/formats-gpl/matlab');

```

⁴<https://github.com/openmicroscopy/bioformats/tree/develop/components/formats-gpl/test/matlab>

⁵<https://github.com/psexton/matlab-xunit>

```
addpath('/path/to/bioformats/artifacts');  
% For developers working against a built artifact, e.g. a release  
% addpath('/path/to/bfmatlab');
```

You can run all the MATLAB tests using **runxunit**:

```
cd /path/to/bioformats/components/formats-gpl/test/matlab  
runxunit
```

Individual test classes can be run by passing the name of the class:

```
cd /path/to/bioformats/components/formats-gpl/test/matlab  
runxunit TestBfsave
```

Individual test methods can be run by passing the name of the class and the name of the method:

```
cd /path/to/bioformats/components/formats-gpl/test/matlab  
runxunit TestBfsave:testLZW
```

Finally to output the test results under XML format, you can use the `-xmlfile` option:

```
cd /path/to/bioformats/components/formats-gpl/test/matlab  
runxunit -xmlfile test-output.xml
```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁶](#) or the [previous versions⁷](#) page to find documentation for the version you are using.

15.2 Public test data

Most of the data-driven tests would benefit from having a comprehensive set of public sample data (see also [#4086⁸](#)).

Formats for which we already have public sample data:

A ‘*’ indicates that we could generate more public data in this format.

- ICS (*)
- Leica LEI
- IPLab
- BMP (*)
- Image-Pro SEQ
- QuickTime (*)
- Bio-Rad PIC
- Image-Pro Workspace
- Fluoview/ABD TIFF (*)
- Perkin Elmer Ultraview
- Gatan DM3

⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁸<http://trac.openmicroscopy.org.uk/ome/ticket/4086>

- Zeiss LSM
- Openlab LIFF (*)
- Leica LIF (*)
- TIFF (*)
- Khoros (<http://netghost.narod.ru/gff/sample/images/viff/index.htm>)
- MNG ([Download⁹](#)) (*)

Formats for which we can definitely generate public sample data:

- PNG/APNG
- JPEG
- PGM
- FITS
- PCX
- GIF
- Openlab Raw
- OME-XML
- OME-TIFF
- AVI
- PICT
- LIM
- PSD
- Targa
- Bio-Rad Gel
- Fake
- ECAT-7 (minctoecat)
- NRRD
- JPEG-2000
- Micromanager
- Text
- DICOM
- MINC (rawtominc)
- NIfTI (dicomnifti)
- Analyze 7.5 (medcon)
- SDT
- FV1000 .oib/.oif
- Zeiss ZVI
- Leica TCS
- Aperio SVS
- Imaris (raw)

Formats for which I need to check whether or not we can generate public sample data:

- IPLab Mac (Ivision)

⁹http://sourceforge.net/projects/libmng/files/libmng-testsuites/Release-20030305/MNGsuite-20030305.zip/download?use_mirror=freefr&download=

- Deltavision
- MRC
- Gatan DM2
- Imaris (HDF)
- EPS
- Alicona AL3D
- Visitech
- InCell
- L2D
- FEI
- NAF
- MRW
- ARF
- LI-FLIM
- Oxford Instruments
- VG-SAM
- Hamamatsu HIS
- WA-TOP
- Seiko
- TopoMetrix
- UBM
- Quesant
- RHK
- Molecular Imaging
- JEOL
- Amira
- Unisoku
- Perkin Elmer Densitometer
- Nikon ND2
- SimplePCI .cxd
- Imaris (TIFF)
- Molecular Devices Gel
- Imacon .fff
- LEO
- JPK
- Nikon NEF
- Nikon TIFF
- Prairie
- Metamorph TIFF/STK/ND
- Improvision TIFF
- Photoshop TIFF

- FEI TIFF
- SimplePCI TIFF
- Burleigh
- SM-Camera
- SBIG

Formats for which we definitely cannot generate public sample data:

- TillVision
- Olympus CellR/APL
- Slidebook
- Cellomics
- CellWorX
- Olympus ScanR
- BD Pathway
- Opera Flex
- MIAS

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version¹⁰](#) or the [previous versions¹¹](#) page to find documentation for the version you are using.

15.3 Generating test images

Sometimes it is nice to have a file of a specific size or pixel type for testing. To generate a file (that contains gradient images):

```
touch "my-special-test-file&pixelType=uint8&sizeX=8192&sizeY=8192.fake"
```

Whatever is before the & is the image name; remaining key value pairs should be pretty self-explanatory. Just replace the values with whatever you need for testing.

Additionally, you can put such values in a separate .ini file:

```
touch my-special-test-file.fake
echo "pixelType=uint8" >> my-special-test-file.fake.ini
echo "sizeX=8192" >> my-special-test-file.fake.ini
echo "sizeY=8192" >> my-special-test-file.fake.ini
```

In fact, just the .fake.ini file alone suffices:

```
echo "pixelType=uint8" >> my-special-test-file.fake
echo "sizeX=8192" >> my-special-test-file.fake
echo "sizeY=8192" >> my-special-test-file.fake
```

If you include a "[GlobalMetadata]" section to the ini file, then all the included values will be accessible from the global metadata map:

```
echo "[GlobalMetadata]" >> my-special-test-file.fake.ini
echo "my.key=some.value" >> my-special-test-file.fake.ini
```

¹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹<http://www.openmicroscopy.org/site/support/legacy/>

There are a few other keys that can be added as well:

Key	Value
thumbSizeX	number of pixels wide, for the thumbnail
thumbSizeY	number of pixels tall, for the thumbnail
physicalSizeX	real width of the pixels, supports units defaulting to microns
physicalSizeY	real height of the pixels, supports units defaulting to microns
physicalSizeZ	real depth of the pixels, supports units defaulting to microns
sizeZ	number of Z sections
sizeC	number of channels
sizeT	number of timepoints
bitsPerPixel	number of valid bits (<= number of bits implied by pixel type)
acquisitionDate	timestamp formatted as “yyyy-MM-dd_HH-mm-ss”
rgb	number of channels that are merged together
dimOrder	dimension order (e.g. XYZCT)
little	whether or not the pixel data should be little-endian
interleaved	whether or not merged channels are interleaved
indexed	whether or not a color lookup table is present
falseColor	whether or not the color lookup table is just for making the image look pretty
series	number of series (Images)
lutLength	number of entries in the color lookup table
exposureTime	time of exposure, supports units defaulting to seconds
plates	number of plates to generate
plateAcqs	number of plate runs
plateRows	number of rows per plate
plateCols	number of rows per plate
fields	number of fields per well
annLong, annDouble, annMap, annComment, annBool, annTime, annTag, annTerm, annXml	number of annotations of the given type to generate

You can often work with the .fake file directly, but in some cases support for those files is disabled and so you will need to convert the file to something else. Make sure that you have Bio-Formats built and the JARs in your CLASSPATH (individual JARs or just `bioformats_package.jar`):

```
bfconvert test&pixelType=uint8&sizeX=8192&sizeY=8192.fake test.tiff
```

If you do not have the command line tools installed, substitute `loci.formats.tools.ImageConverter`¹² for `bfconvert`.

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹³ or the previous versions¹⁴ page to find documentation for the version you are using.

15.4 Writing a new file format reader

This document is a brief guide to writing new Bio-Formats file format readers.

All format readers should extend either `loci.formats.FormatReader`¹⁵ or an existing reader¹⁶.

¹²<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-tools/src/loci/formats/tools/ImageConverter.java>

¹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁴<http://www.openmicroscopy.org/site/support/legacy/>

¹⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html>

¹⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/in/package-summary.html>

15.4.1 Methods to override

- `isSingleFile(java.lang.String)`¹⁷ Whether or not the named file is expected to be the only file in the dataset. This only needs to be overridden for formats whose datasets can contain more than one file.
- `isThisType(loci.common.RandomAccessInputStream)`¹⁸ Check the first few bytes of a file to determine if the file can be read by this reader. You can assume that index 0 in the stream corresponds to the index 0 in the file. Return true if the file can be read; false if not (or if there is no way of checking).
- `fileGroupOption(java.lang.String)`¹⁹ Returns an indication of whether or not the files in a multi-file dataset can be handled individually. The return value should be one of the following:
 - `FormatTools.MUST_GROUP`²⁰: the files cannot be handled separately
 - `FormatTools.CAN_GROUP`²¹: the files may be handled separately or as a single unit
 - `FormatTools.CANNOT_GROUP`²²: the files must be handled separately

This method only needs to be overridden for formats whose datasets can contain more than one file.

- `getSeriesUsedFiles(boolean)`²³ You only need to override this if your format uses multiple files in a single dataset. This method should return a list of all files associated with the given file name and the current series (i.e. every file needed to display the current series). If the `noPixels` flag is set, then none of the files returned should contain pixel data. For an example of how this works, see `loci.formats.in.PerkinElmerReader`²⁴. It is recommended that the first line of this method be `FormatTools.assertId(currentId, true, 1)` - this ensures that the file name is non-null.
- `openBytes(int, byte[], int, int, int, int)`²⁵ Returns a byte array containing the pixel data for a subimage specified image from the given file. The dimensions of the subimage (upper left X coordinate, upper left Y coordinate, width, and height) are specified in the final four int parameters. This should throw a `FormatException`²⁶ if the image number is invalid (less than 0 or \geq the number of images). The ordering of the array returned by `openBytes` should correspond to the values returned by `isLittleEndian`²⁷ and `isInterleaved`²⁸. Also, the length of the byte array should be [image width * image height * bytes per pixel]. Extra bytes will generally be truncated. It is recommended that the first line of this method be `FormatTools.checkPlaneParameters(this, no, buf.length, x, y, w, h)` - this ensures that all of the parameters are valid.
- `initFile(java.lang.String)`²⁹ The majority of the file parsing logic should be placed in this method. The idea is to call this method once (and only once!) when the file is first opened. Generally, you will want to start by calling `super.initFile(String)`. You will also need to set up the stream for reading the file, as well as initializing any dimension information and metadata. Most of this logic is up to you; however, you should populate the `core`³⁰ variable (see `loci.formats.CoreMetadata`³¹).

Note that each variable is initialized to 0 or null when `super.initFile(String)` is called. Also, `super.initFile(String)` constructs a Hashtable called `metadata`³² where you should store any relevant metadata.

The most common way to set up the OME-XML metadata for the reader is to initialize the `MetadataStore` using the `makeFilterMetadata()`³³ method and populate the `Pixels` elements of the metadata store from the `core` variable using the `MetadataTools.populatePixels(MetadataStore, FormatReader)`³⁴ method:

¹⁷[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isSingleFile\(java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isSingleFile(java.lang.String))

¹⁸[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isThisType\(loci.common.RandomAccessInputStream\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isThisType(loci.common.RandomAccessInputStream))

¹⁹[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#fileGroupOption\(java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#fileGroupOption(java.lang.String))

²⁰http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#MUST_GROUP

²¹http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#CAN_GROUP

²²http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html#CANNOT_GROUP

²³[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSeriesUsedFiles\(boolean\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getSeriesUsedFiles(boolean))

²⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PerkinElmerReader.java>

²⁵[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#openBytes\(int, byte\[\], int, int, int, int\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#openBytes(int, byte[], int, int, int, int))

²⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatException.html>

²⁷[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isLittleEndian\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isLittleEndian())

²⁸[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isInterleaved\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#isInterleaved())

²⁹[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#initFile\(java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#initFile(java.lang.String))

³⁰<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#core>

³¹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/CoreMetadata.html>

³²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#metadata>

³³[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#makeFilterMetadata\(\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#makeFilterMetadata())

³⁴[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/MetadataTools.html#populatePixels\(loci.formats.meta.MetadataStore, loci.formats.IFormatReader\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/MetadataTools.html#populatePixels(loci.formats.meta.MetadataStore, loci.formats.IFormatReader))

```
# Initialize the OME-XML metadata from the core variable
MetadataStore store = makeFilterMetadata();
MetadataTools.populatePixels(store, this);
```

If the reader includes metadata at the plane level, you can initialize the Plane elements under the Pixels using `MetadataTools.populatePixels(MetadataStore, FormatReader, doPlane)`³⁵:

```
MetadataTools.populatePixels(store, this, true);
```

Once the metadata store has been initialized with the core properties, additional metadata can be added to it using the setter methods. Note that for each of the model components, the `setObjectID()` method should be called before any of the `setObjectProperty()` methods, e.g.:

```
# Add an oil immersion objective with achromat
String objectiveID = MetadataTools.createLSID("Objective", 0, 0);
store.setObjectiveID(objectiveID, 0, 0);
store.setObjectiveImmersion(getImmersion("Oil"), 0, 0);
```

- `close(boolean)`³⁶ Cleans up any resources used by the reader. Global variables should be reset to their initial state, and any open files or delegate readers should be closed.

Note that if the new format is a variant of a format currently supported by Bio-Formats, it is more efficient to make the new reader a subclass of the existing reader (rather than subclassing `loci.formats.FormatReader`³⁷). In this case, it is usually sufficient to override `initFile(java.lang.String)`³⁸ and `isThisType(byte[])`³⁹.

Every reader also has an instance of `loci.formats.CoreMetadata`⁴⁰. All readers should populate the fields in `CoreMetadata`, which are essential to reading image planes.

If you read from a file using something other than `loci.common.RandomAccessInputStream`⁴¹ or `loci.common.Location`⁴², you *must* use the file name returned by `Location.getMappedId(String)`, not the file name passed to the reader. Thus, a stub for `initFile(String)` might look like this:

```
protected void initFile(String id) throws FormatException, IOException {
    super.initFile(id);

    RandomAccessInputStream in = new RandomAccessInputStream(id);
    // alternatively,
    //FileInputStream in = new FileInputStream(Location.getMappedId(id));

    // read basic file structure and metadata from stream
}
```

For more details, see `loci.common.Location.mapId(java.lang.String, java.lang.String)`⁴³ and `loci.common.Location.getMappedId(java.lang.String)`⁴⁴.

³⁵[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/MetadataTools.html#populatePixels\(loci.formats.meta.MetadataStore, loci.formats.IFormatReader, boolean\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/MetadataTools.html#populatePixels(loci.formats.meta.MetadataStore, loci.formats.IFormatReader, boolean))

³⁶[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#close\(boolean\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#close(boolean))

³⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html>

³⁸[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#initFile\(java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#initFile(java.lang.String))

³⁹[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#isThisType\(byte\[\]\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#isThisType(byte[]))

⁴⁰<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/CoreMetadata.html>

⁴¹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/RandomAccessInputStream.html>

⁴²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/Location.html>

⁴³[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/Location.html#mapId\(java.lang.String, java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/Location.html#mapId(java.lang.String, java.lang.String))

⁴⁴[http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/Location.html#getMappedId\(java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/Location.html#getMappedId(java.lang.String))

15.4.2 Variables to populate

There are a number of global variables defined in `loci.formats.FormatReader`⁴⁵ that should be populated in the constructor of any implemented reader.

These variables are:

- `suffixNecessary`⁴⁶ Indicates whether or not a file name suffix is required; true by default
- `suffixSufficient`⁴⁷ Indicates whether or not a specific file name suffix guarantees that this reader can open a particular file; true by default
- `hasCompanionFiles`⁴⁸ Indicates whether or not there is at least one file in a dataset of this format that contains only metadata (no images); false by default
- `datasetDescription`⁴⁹ A brief description of the layout of files in datasets of this format; only necessary for multi-file datasets
- `domains`⁵⁰ An array of imaging domains for which this format is used. Domains are defined in `loci.formats.FormatTools`⁵¹.

15.4.3 Other useful things

- `loci.common.RandomAccessInputStream`⁵² is a hybrid `RandomAccessFile/InputStream` class that is generally more efficient than either `RandomAccessFile` or `InputStream`, and implements the `DataInput` interface. It is recommended that you use this for reading files.
- `loci.common.Location`⁵³ provides an API similar to `java.io.File`, and supports File-like operations on URLs. It is highly recommended that you use this instead of `File`. See the [Javadocs](#)⁵⁴ for additional information.
- `loci.common.DataTools`⁵⁵ provides a number of methods for converting bytes to shorts, ints, longs, etc. It also supports reading most primitive types directly from a `RandomAccessInputStream` (or other `DataInput` implementation).
- `loci.formats.ImageTools`⁵⁶ provides several methods for manipulating primitive type arrays that represent images. Consult the source or Javadocs for more information.
- If your reader relies on third-party code which may not be available to all users, it is strongly suggested that you make a corresponding service class that interfaces with the third-party code. Please see *Bio-Formats service and dependency infrastructure* for a description of the service infrastructure, as well as the `loci.formats.services` package⁵⁷.
- Several common image compression types are supported through subclasses of `loci.formats.codec.BaseCodec`⁵⁸. These include JPEG, LZW, LZO, Base64, ZIP and RLE (PackBits).
- If you wish to convert a file's metadata to OME-XML (strongly encouraged), please see *Bio-Formats metadata processing* for further information.
- Once you have written your file format reader, add a line to the `readers.txt`⁵⁹ file with the fully qualified name of the reader, followed by a '#' and the file extensions associated with the file format. Note that `loci.formats.ImageReader`⁶⁰, the master file format reader, tries to identify which format reader to use according to the order given in `readers.txt`⁶¹, so be sure to place your reader in an appropriate position within the list.
- The easiest way to test your new reader is by calling "java loci.formats.tools.ImageInfo <file name>". If all goes well, you should see all of the metadata and dimension information, along with a window showing the images in the file.

⁴⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html>

⁴⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#suffixNecessary>

⁴⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#suffixSufficient>

⁴⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#hasCompanionFiles>

⁴⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#datasetDescription>

⁵⁰<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#domains>

⁵¹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatTools.html>

⁵²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/RandomAccessInputStream.html>

⁵³<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/Location.html>

⁵⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/>

⁵⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/DataTools.html>

⁵⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ImageTools.html>

⁵⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/services/package-summary.html>

⁵⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/codec/BaseCodec.html>

⁵⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-api/src/loci/formats/readers.txt>

⁶⁰<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ImageReader.html>

⁶¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-api/src/loci/formats/readers.txt>

`loci.formats.ImageReader`⁶² can take additional parameters; a brief listing is provided below for reference, but it is recommended that you take a look at the contents of `loci.formats.tools.ImageInfo`⁶³ to see exactly what each one does.

Argument	Action
-version	print the library version and exit
file	the image file to read
-nopix	read metadata only, not pixels
-nocore	do not output core metadata
-nometa	do not parse format-specific metadata table
-nofilter	do not filter metadata fields
-thumbs	read thumbnails instead of normal pixels
-minmax	compute min/max statistics
-merge	combine separate channels into RGB image
-nogroup	force multi-file datasets to be read as individual files
-stitch	stitch files with similar names
-separate	split RGB image into separate channels
-expand	expand indexed color to RGB
-omexml	populate OME-XML metadata
-normalize	normalize floating point images*
-fast	paint RGB images as quickly as possible*
-debug	turn on debugging output
-range	specify range of planes to read (inclusive)
-series	specify which image series to read
-swap	override the default input dimension order
-shuffle	override the default output dimension order
-map	specify file on disk to which name should be mapped
-preload	pre-read entire file into a buffer; significantly reduces the time required to read the images, but requires more memory
-crop	crop images before displaying; argument is 'x,y,w,h'
-autoscale	used in combination with '-fast' to automatically adjust brightness and contrast
-novalid	do not perform validation of OME-XML
-omexml-only	only output the generated OME-XML
-format	read file with a particular reader (e.g., ZeissZVI)

* = may result in loss of precision

- If you wish to test using TestNG, `loci.tests.testng.FormatReaderTest`⁶⁴ provides several basic tests that work with all Bio-Formats readers. See the `FormatReaderTest` source code for additional information.
- For more details, please look at the source code and Javadocs⁶⁵. Studying existing readers is probably the best way to get a feel for the API; we would recommend first looking at `loci.formats.in.ImarisReader`⁶⁶ (this is the most straightforward one). `loci.formats.in.LIFReader`⁶⁷ and `InCellReader`⁶⁸ are also good references that show off some of the nicer features of Bio-Formats.

If you have questions about Bio-Formats, please contact the [OME team](#)⁶⁹.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁰ or the [previous versions](#)⁷¹ page to find documentation for the version you are using.

⁶²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ImageReader.html>

⁶³<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-tools/src/loci/formats/tools/ImageInfo.java>

⁶⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/tests/testng/FormatReaderTest.html>

⁶⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/>

⁶⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImarisReader.java>

⁶⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LIFReader.java>

⁶⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/InCellReader.java>

⁶⁹<http://www.openmicroscopy.org/site/community>

⁷⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷¹<http://www.openmicroscopy.org/site/support/legacy/>

15.5 Bio-Formats service and dependency infrastructure

15.5.1 Description

The Bio-Formats service infrastructure is an interface driven pattern for dealing with external and internal dependencies. The design goal was mainly to avoid the cumbersome usage of `ReflectedUniverse` where possible and to clearly define both service dependency and interface between components. This is generally referred to as [dependency injection](#)⁷², [dependency inversion](#)⁷³ or [component based design](#)⁷⁴.

It was decided, at this point, to forgo the usage of potentially more powerful but also more complicated solutions such as:

- Spring (<http://spring.io>)
- Guice (<http://code.google.com/p/google-guice/>)
- ...

The Wikipedia page for [dependency injection](#)⁷⁵ contains many other implementations in many languages.

An added benefit is the potential code reuse possibilities as a result of decoupling of dependency and usage in Bio-Formats readers. Implementations of the initial Bio-Formats services were completed as part of `BioFormatsCleanup` and tickets [#463](#)⁷⁶ and [#464](#)⁷⁷.

15.5.2 Writing a service

- **Interface** – The basic form of a service is an interface which inherits from `loci.common.services.Service`⁷⁸. Here is a very basic example using the (now removed) `OMENotesService`

```
public interface OMENotesService extends Service {

    /**
     * Creates a new OME Notes instance.
     * @param filename Path to the file to create a Notes instance for.
     */
    public void newNotes(String filename);

}
```

- **Implementation** – This service then has an implementation, which is usually located in the Bio-Formats component or package which imports classes from an external, dynamic or other dependency. Again looking at the `OMENotesService`:

```
public class OMENotesServiceImpl extends AbstractService
    implements OMENotesService {

    /**
     * Default constructor.
     */
    public OMENotesServiceImpl() {
        checkClassDependency(Notes.class);
    }

    /* (non-Javadoc)
     * @see loci.formats.dependency.OMENotesService#newNotes()
     */
    public void newNotes(String filename) {
        new Notes(null, filename);
    }

}
```

⁷²http://en.wikipedia.org/wiki/Dependency_injection

⁷³http://en.wikipedia.org/wiki/Dependency_inversion_principle

⁷⁴http://en.wikipedia.org/wiki/Component-based_software_engineering

⁷⁵http://en.wikipedia.org/wiki/Dependency_injection

⁷⁶<http://trac.openmicroscopy.org.uk/ome/ticket/463>

⁷⁷<http://trac.openmicroscopy.org.uk/ome/ticket/464>

⁷⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/services/Service.html>

```

    }
}

```

- **Style**

- Extension of `AbstractService` to enable uniform runtime dependency checking is recommended. Java does not check class dependencies until classes are first instantiated so if you do not do this, you may end up with `ClassNotFoundException` or the like exceptions being emitted from your service methods. This is to be **strongly** discouraged. If a service has unresolvable classes on its CLASSPATH instantiation should fail, not service method invocation.
- Service methods should not burden the implementer with numerous checked exceptions. Also external dependency exception instances should not be allowed to directly leak from a service interface. Please wrap these using a `ServiceException`.
- By convention both the interface and implementation are expected to be in a package named `loci.*.services`. This is not a hard requirement but should be followed where possible.

- **Registration** – A service's interface and implementation must finally be *registered* with the `loci.common.services.ServiceFactory`⁷⁹ via the `services.properties` file. Following the `OMENotesService` again, here is an example registration:

```

...
# OME notes service (implementation in legacy ome-notes component)
loci.common.services.OMENotesService=loci.ome.notes.services.OMENotesServiceImpl
...

```

See also:

loci.common.services.Service⁸⁰. Source code for `loci.common.services.Service` interface

loci.common.services.ServiceFactory⁸¹ Source code for `loci.common.services.Service` interface

15.5.3 Using a service

```

OMENotesService service = null;
try {
    ServiceFactory factory = new ServiceFactory();
    service = factory.getInstance(OMENotesService.class);
}
catch (DependencyException de) {
    LOGGER.info("", de);
}
...

```

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁸² or the [previous versions](#)⁸³ page to find documentation for the version you are using.

15.6 Code generation with xsd-fu

xsd-fu is a Python application designed to digest OME XML schema and produce an object-oriented Java infrastructure to ease work with an XML DOM tree. It is usually run automatically when building from source (see [Building from source](#)) and so running it by hand should not be needed. **xsd-fu** is primarily used to generate the OME-XML model objects, enums and enum handlers, plus the `MetadataStore` and `MetadataRetrieve` interfaces and implementations.

⁷⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/services/ServiceFactory.html>

⁸²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸³<http://www.openmicroscopy.org/site/support/legacy/>

15.6.1 Available options

-d, --dry-run

Run all source generation processing, but don't write output files. In combination with `--print-depends` or `--print-generated`, this option may be used to dynamically introspect command dependencies and output to create build rules on the fly for e.g. **cmake**.

--debug

Enable xsd-fu debugging messages and template debugging. The code templates contain diagnostic messages to debug the template processing, which are normally suppressed in the code output; enabling debugging will add these diagnostic messages to the generated code.

-l language, --language=language

Generate code for the specified language. Currently supported options are *C++* and *Java*.

--metadata-package=package

Package or namespace for the metadata store and retrieve classes.

--ome-xml-metadata-package

Package or namespace for the OME-XML metadata classes.

--ome-xml-model-package=package

Package or namespace for the OME-XML model classes.

--ome-xml-model-enums-package=package

Package or namespace for the OME-XML model enum classes.

--ome-xml-model-enum-handlers-package=package

Package or namespace for the OME-XML model enum handler classes.

-o dir, --output-directory=dir

Output generated code into the specified directory. The directory will be created if it does not already exist. Note that the directory is the root of the source tree; generated classes will be placed into the appropriate module-specific locations under this root.

--print-depends

Print a list of the files required during template processing, including schema files, templates and custom template fragments. Particularly useful with `--dry-run` to introspect command dependencies.

--print-generated

Print a list of the files generated during template processing. Particularly useful with `--dry-run` to determine what a given command would generate.

-q, --quiet

Do not print names of generated files.

-t path, --template-path=path

Path to search for Genshi template files. Defaults to the language-specific template directory in *components/xsd-fu*.

-n, --xsd-namespace

XML schema namespace to use. Defaults to *xsd:*.

-v, --verbose

Print names of generated files as they are processed.

15.6.2 Available commands

- doc_gen
- metadata
- omero_metadata
- omero_model
- omexml_metadata
- omexml_metadata_all
- omexml_model

- `omexml_model_all`
- `omexml_model_enums`
- `omexml_model_enum_handlers`
- `omexml_model_enum_includeall`
- `tab_gen`

15.6.3 Running the code generator

Run `xsd-fu` script with no arguments to examine the syntax:

```
./components/xsd-fu/xsd-fu
Error: Missing subcommand
```

```
xsd-fu: Generate classes from an OME-XML schema definition
Usage: ./components/xsd-fu/xsd-fu command [options...] -o output_dir schema_files...
```

Options:

<code>-d, --dry-run</code>	Do not create output files
<code>--debug</code>	Enable <code>xsd-fu</code> and template debugging
<code>-l, --language=lang</code>	Generated language
<code>--metadata-package=pkg</code>	Metadata package
<code>--ome-xml-metadata-package=pkg</code>	OME-XML metadata class package
<code>--ome-xml-model-package=pkg</code>	OME-XML model package
<code>--ome-xml-model-enums-package=pkg</code>	OME-XML model enum package
<code>--ome-xml-model-enum-handlers-package=pkg</code>	OME-XML model enum handler package
<code>-o, --output-directory=dir</code>	Generated output directory
<code>-q, --quiet</code>	Do not output file names
<code>-t, --template-path=path</code>	Genshi template path
<code>-v, --verbose</code>	Output generated file names
<code>-n, --xsd-namespace</code>	XML schema namespace

Available subcommands:

```
debug
doc_gen
omexml_model_enum_handlers
omexml_model_enums
omexml_model
metadata
omero_metadata
omero_model
omexml_metadata
tab_gen
```

Default XSD namespace: `"xsd:"`

Default Java OME-XML package: `"ome.xml.model"`

Default Java OME-XML enum package: `"ome.xml.model.enums"`

Default Java OME-XML enum handler package: `"ome.xml.model.enums.handlers"`

Default Java metadata package: `"loci.formats.meta"`

Default Java OME-XML metadata package: `"loci.formats.ome"`

Default C++ OME-XML package: `"ome::xml::model"`

Default C++ OME-XML enum package: `"ome::xml::model::enums"`

Default C++ metadata package: `"ome::xml::meta"`

Default C++ OME-XML metadata package: `"ome::xml::meta"`

Examples:

```
./components/xsd-fu/xsd-fu -l Java -n 'xsd:' --ome-xml-model-package=ome.xml.model -o omexml /path/to/output
./components/xsd-fu/xsd-fu -l C++ -n 'xsd:' --ome-xml-model-package=ome::xml::model -o omexml /path/to/output
```

Report bugs to OME Devel <ome-devel@lists.openmicroscopy.org.uk>

Note: It should not be necessary to run it by hand for a normal Bio-Formats build. **xsd-fu** is run automatically as part of the main Bio-Formats build from version 5.0 when building the *ome-xml* and *scifio* components. It is still useful to run by hand when debugging, or using non-standard targets.

15.6.4 Generating the OME-XML Java model and metadata classes

The following sections outline how to generate parts of the OME-XML Java interfaces and implementations for the object model and metadata store, which are composed of:

- OME model objects
- enumerations for OME model properties
- enumeration handlers for regular expression matching of enumeration strings
- Metadata store and Metadata retrieve interfaces for all OME model properties
- various implementations of Metadata store and/or Metadata retrieve interfaces

All of the above can be generated by this Ant command:

```
$ cd components/ome-xml
$ ant generate-source
```

Run:

```
$ ant generate-source -v
```

to see the command-line options used.

15.6.5 Working with Enumerations and Enumeration Handlers

XsdFu code generates enumeration regular expressions using a flexible [configuration file](#)⁸⁴.

Each enumeration has a key-value listing of regular expression to exact enumeration value matches. For example:

```
[Correction]
".*Pl.*Apo.*" = "PlanApo"
".*Pl.*Flu.*" = "PlanFluor"
"^\\s*Vio.*Corr.*" = "VioletCorrected"
".*S.*Flu.*" = "SuperFluor"
".*Neo.*flu.*" = "Neofluar"
".*Flu.*tar.*" = "Fluotar"
".*Fluo.*" = "Fluor"
".*Flua.*" = "Fluar"
"^\\s*Apo.*" = "Apo"
```

15.6.6 Generate OMERO model specification files

Run **xsd-fu** with the `omero_model` subcommand.

⁸⁴https://github.com/openmicroscopy/bioformats/blob/develop/components/xsd-fu/cfg/enum_handler.cfg

15.6.7 Special thanks

A special thanks goes out to [Dave Kuhlman](http://www.davekuhlman.org/)⁸⁵ for his fabulous work on [generateDS](http://www.davekuhlman.org/generateDS.html)⁸⁶ which **xsd-fu** makes heavy use of internally.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](http://www.openmicroscopy.org/site/support/bio-formats5.0/)⁸⁷ or the [previous versions](http://www.openmicroscopy.org/site/support/legacy/)⁸⁸ page to find documentation for the version you are using.

15.7 Scripts for performing development tasks

The `tools` directory contains several scripts which are useful for building and performing routine updates to the code base.

15.7.1 bump_maven_version.py

This updates the Maven POM version numbers for all `pom.xml` files that set *groupId* to *ome*. The script takes a single argument, which is the new version. For example, to update the POM versions prior to release:

```
./tools/bump_maven_version.py 5.1.0
```

and to switch back to snapshot versions immediately after release:

```
./tools/bump_maven_version.py 5.1.1-SNAPSHOT
```

15.7.2 test-build

This is the script used by Travis to test each commit. It compiles and runs tests on each of the components in the Bio-Formats repository according to the arguments specified. Valid arguments are:

- *clean*: cleans the Maven build directories
- *maven*: builds all Java components using Maven and runs unit tests
- *cpp*: builds the native C++ code alone
- *cppwrap*: builds the auto-generated C++ bindings for the Java API
- *sphinx*: builds the Sphinx documentation alone
- *ant*: builds all Java components using Ant and runs unit tests
- *all*: equivalent of *clean maven cppwrap sphinx ant*

15.7.3 update_copyright

This updates the end year in the copyright blocks of all source code files. The command takes no arguments, and sets the end year to be the current year. As *update_copyright* is a Bash script, it is not intended to be run on Windows.

See [open Trac tickets for Bio-Formats](https://trac.openmicroscopy.org.uk/ome/report/44)⁸⁹ for information on work currently planned or in progress.

For more general guidance about how to contribute to OME projects, see the [Contributing developers documentation](http://www.openmicroscopy.org/site/support/contributing/index.html)⁹⁰.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](http://www.openmicroscopy.org/site/support/bio-formats5.0/)⁹¹ or the [previous](http://www.openmicroscopy.org/site/support/legacy/)

⁸⁵<http://www.davekuhlman.org/>

⁸⁶<http://www.davekuhlman.org/generateDS.html>

⁸⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁸⁹<https://trac.openmicroscopy.org.uk/ome/report/44>

⁹⁰<http://www.openmicroscopy.org/site/support/contributing/index.html>

versions⁹² page to find documentation for the version you are using.

⁹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹²<http://www.openmicroscopy.org/site/support/legacy/>

Part IV

Formats

Bio-Formats supports over 140 different file formats. The *Dataset Structure Table* explains the file extension you should choose to open/import a dataset in any of these formats, while the *Supported Formats* table lists all of the formats and gives an indication of how well they are supported and whether Bio-Formats can write, as well as read, each format. The *Summary of supported metadata fields* table shows an overview of the *OME data model* fields populated for each format.

We are always looking for examples of files to help us provide better support for different formats. If you would like to help, you can upload files using our [QA system uploader](#)⁹³. If you have any questions, or would prefer not to use QA, please email the [ome-users mailing list](#)⁹⁴. If your format is already supported, please refer to the ‘we would like to have’ section on the individual page for that format, to see if your dataset would be useful to us.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁹⁵ or the [previous versions](#)⁹⁶ page to find documentation for the version you are using.

⁹³<http://qa.openmicroscopy.org.uk/qa/upload/>

⁹⁴<http://www.openmicroscopy.org/site/community/mailing-lists>

⁹⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹⁶<http://www.openmicroscopy.org/site/support/legacy/>

DATASET STRUCTURE TABLE

This table shows the extension of the file that you should choose if you want to open/import a dataset in a particular format.

Format name	File to choose	Structure of files
AIM	.aim	Single file
ARF	.arf	Single file
Adobe Photoshop	.psd	Single file
Adobe Photoshop TIFF	.tif, .tiff	Single file
Alicona AL3D	.al3d	Single file
Amersham Biosciences GEL	.gel	Single file
Amira	.am, .amiramesh, .grey, .hx, .labels	Single file
Analyze 7.5	.img, .hdr	One .img file and one similarly-named .hdr file
Andor SIF	.sif	Single file
Animated PNG	.png	Single file
Aperio SVS	.svs	Single file
Audio Video Interleave	.avi	Single file
BD Pathway	.exp, .tif	Multiple files (.exp, .dye, .ltp, ...) plus one or more directories containing .tif and .bmp files
Bio-Rad GEL	.lsc	Single file
Bio-Rad PIC	.pic, .xml, .raw	One or more .pic files and an optional lsc.xml file
Bitplane Imaris	.ims	Single file
Bitplane Imaris 3 (TIFF)	.ims	Single file
Bitplane Imaris 5.5 (HDF)	.ims	Single file
Bruker	(no extension)	One 'fid' and one 'acqp' plus several other metadata files and a 'pdata' directory
Burleigh	.img	Single file
Canon RAW	.cr2, .crw, .jpg, .thm, .wav	Single file
CellSens VSI	.vsi, .ets	One .vsi file and an optional directory with a similar name that contains at least one subdirectory with .ets files
CellWorx	.pnl, .htd, .log	One .htd file plus one or more .pnl or .tif files and optionally one or more .log files
Cellomics C01	.c01, .dib	One or more .c01 files
Compix Simple-PCI	.cxd	Single file
DICOM	.dic, .dcm, .dicom, .jp2, .j2ki, .j2kr, .raw, .ima	One or more .dcm or .dicom files
DNG	.cr2, .crw, .jpg, .thm, .wav, .tif, .tiff	Single file
Deltavision	.dv, .r3d, .r3d_d3d, .dv.log, .r3d.log	One .dv, .r3d, or .d3d file and up to two optional .log files
ECAT7	.v	Single file
Encapsulated PostScript	.eps, .epsi, .ps	Single file

Continued on next page

Table 16.1 – continued from previous page

Format name	File to choose	Structure of files
Evotec Flex	.flex, .mea, .res	One directory containing one or more .flex files, and an optional directory containing an .mea and .res file. The .mea and .res files may also be in the same directory as the .flex file(s).
FEI TIFF	.tif, .tiff	Single file
FEI/Philips	.img	Single file
Flexible Image Transport System	.fits, .fts	Single file
Fuji LAS 3000	.img, .inf	Single file
Gatan DM2	.dm2	Single file
Gatan Digital Micrograph	.dm3	Single file
Graphics Interchange Format	.gif	Single file
Hamamatsu Aquacosmos	.naf	Single file
Hamamatsu HIS	.his	Single file
Hamamatsu NDPI	.ndpi	Single file
Hamamatsu NDPIs	.ndpis	One .ndpis file and at least one .ndpi file
Hamamatsu VMS	.vms	One .vms file plus several .jpg files
Hitachi	.txt	One .txt file plus one similarly-named .tif, .bmp, or .jpg file
IMAGIC	.hed, .img	One .hed file plus one similarly-named .img file
IMOD	.mod	Single file
INR	.inr	Single file
IPLab	.ipl	Single file
IVision	.ipm	Single file
Imacon	.fff	Single file
Image Cytometry Standard	.ics, .ids	One .ics and possibly one .ids with a similar name
Image-Pro Sequence	.seq	Single file
Image-Pro Workspace	.ipw	Single file
Improvision TIFF	.tif, .tiff	Single file
InCell 1000/2000	.xdce, .xml, .tiff, .tif, .xlog	One .xdce file with at least one .tif/.tiff or .im file
InCell 3000	.frm	Single file
JEOL	.dat, .img, .par	A single .dat file or an .img file with a similarly-named .par file
JPEG	.jpg, .jpeg, .jpe	Single file
JPEG-2000	.jp2, .j2k, .jpf	Single file
JKP Instruments	.jpk	Single file
JPX	.jpx	Single file
Khoros XV	.xv	Single file
Kodak Molecular Imaging	.bip	Single file
LEO	.sxm, .tif, .tiff	Single file
LI-FLIM	.fli	Single file
Laboratory Imaging	.lim	Single file
Leica	.lei, .tif, .tiff, .raw	One .lei file with at least one .tif/.tiff file and an optional .txt file
Leica Image File Format	.lif	Single file
Leica SCN	.scn	Single file
Leica TCS TIFF	.tif, .tiff, .xml	Single file
Li-Cor L2D	.l2d, .scn, .tif	One .l2d file with one or more directories containing .tif/.tiff files
MIAS	.tif, .tiff, .txt	One directory per plate containing one directory per well, each with one or more .tif/.tiff files
MINC MRI	.mnc	Single file
Medical Research Council	.mrc, .st, .ali, .map, .rec	Single file

Continued on next page

Table 16.1 – continued from previous page

Format name	File to choose	Structure of files
Metamorph STK	.stk, .nd, .tif, .tiff	One or more .stk or .tif/.tiff files plus an optional .nd file
Metamorph TIFF	.tif, .tiff	One or more .tif/.tiff files
Micro-Manager	.tif, .tiff, .txt, .xml	A ‘metadata.txt’ file plus or or more .tif files
Minolta MRW	.mrw	Single file
Molecular Imaging	.stp	Single file
Multiple Network Graphics	.mng	Single file
NIFTI	.nii, .img, .hdr	A single .nii file or one .img file and a similarly-named .hdr file
NOAA-HRD Gridded Data Format	(no extension)	Single file
NRRD	.nrrd, .nhdr	A single .nrrd file or one .nhdr file and one other file containing the pixels
Nikon Elements TIFF	.tif, .tiff	Single file
Nikon ND2	.nd2	Single file
Nikon NEF	.nef, .tif, .tiff	Single file
Nikon TIFF	.tif, .tiff	Single file
OME-TIFF	.ome.tif, .ome.tiff	One or more .ome.tif files
OME-XML	.ome	Single file
Olympus APL	.apl, .tnb, .mtb, .tif	One .apl file, one .mtb file, one .tnb file, and a directory containing one or more .tif files
Olympus FV1000	.oib, .oif, .pty, .lut	Single .oib file or one .oif file and a similarly-named directory containing .tif/.tiff files
Olympus Fluoview/ABD TIFF	.tif, .tiff	One or more .tif/.tiff files, and an optional .txt file
Olympus SIS TIFF	.tif, .tiff	Single file
Olympus ScanR	.dat, .xml, .tif	One .xml file, one ‘data’ directory containing .tif/.tiff files, and optionally two .dat files
Olympus Slidebook	.sld, .spl	Single file
Openlab LIFF	.liff	Single file
Openlab RAW	.raw	Single file
Oxford Instruments	.top	Single file
PCX	.pcx	Single file
PICT	.pict, .pct	Single file
POV-Ray	.df3	Single file
Perkin Elmer Densitometer	.hdr, .img	One .hdr file and a similarly-named .img file
PerkinElmer	.ano, .cfg, .csv, .htm, .rec, .tim, .zpo, .tif	One .htm file, several other metadata files (.tim, .ano, .csv, ...) and either .tif files or .2, .3, .4, etc. files
PerkinElmer Operetta	.tif, .tiff, .xml	Directory with XML file and one .tif/.tiff file per plane
Portable Gray Map	.pgm	Single file
Prairie TIFF	.tif, .tiff, .cfg, .xml	One .xml file, one .cfg file, and one or more .tif/.tiff files
Pyramid TIFF	.tif, .tiff	Single file
Quesant AFM	.afm	Single file
QuickTime	.mov	Single file
RHK Technologies	.sm2, .sm3	Single file
SBIG	(no extension)	Single file
SM Camera	(no extension)	Single file
SPCImage Data	.sdt	Single file
SPIDER	.spi	Single file
Seiko	.xqd, .xqf	Single file
SimplePCI TIFF	.tif, .tiff	Single file
Simulated data	.fake	Single file
Tagged Image File Format	.tif, .tiff, .tf2, .tf8, .btf	Single file
Text	.txt, .csv	Single file
TillVision	.vws, .pst, .inf	One .vws file and possibly one similarly-named directory
TopoMetrix	.tfr, .ffr, .zfr, .zfp, .2fl	Single file

Continued on next page

Table 16.1 – continued from previous page

Format name	File to choose	Structure of files
Trestle	.tif	One .tif file plus several other similarly-named files (e.g. <i>.FocalPlane-</i> , <i>.sld</i> , <i>.slx</i> , <i>.ROI</i>)
Truevision Targa	.tga	Single file
UBM	.pr3	Single file
Unisoku STM	.hdr, .dat	One .HDR file plus one similarly-named .DAT file
VG SAM	.dti	Single file
Varian FDF	.fdf	Single file
Visitech XYS	.xys, .html	One .html file plus one or more .xys files
Volocity Library	.mvd2, .aisf, .aiix, .dat, .atsf	One .mvd2 file plus a ‘Data’ directory
Volocity Library Clipping	.acff	Single file
WA Technology TOP	.wat	Single file
Windows Bitmap	.bmp	Single file
Zeiss AxioVision TIFF	.tif, .xml	Single file
Zeiss CZI	.czi	Single file
Zeiss Laser-Scanning Microscopy	.lsm, .mdb	One or more .lsm files; if multiple .lsm files are present, an .mdb file should also be present
Zeiss Vision Image (ZVI)	.zvi	Single file
Zip	.zip	Single file

16.1 Flex Support

OMERO.importer supports importing analyzed Flex files from an Opera system.

Basic configuration is done via the `importer.ini`. Once the user has run the Importer once, this file will be in the following location:

- `C:\Documents and Settings\<username>\omero\importer.ini`

The user will need to modify or add the `[FlexReaderServerMaps]` section of the INI file as follows:

```
...
[FlexReaderServerMaps]
CIA-1 = \\hostname1\mount;\\archivehost1\mount
CIA-2 = \\hostname2\mount;\\archivehost2\mount
```

where the *key* of the INI file line is the value of the “Host” tag in the `.mea` measurement XML file (here: `<Host name="CIA-1">`) and the value is a semicolon-separated list of *escaped* UNC path names to the Opera workstations where the Flex files reside.

Once this resolution has been encoded in the configuration file **and** you have restarted the importer, you will be able to select the `.mea` measurement XML file from the Importer user interface as the import target.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹](http://www.openmicroscopy.org/site/support/bio-formats5.0/) or the [previous versions²](http://www.openmicroscopy.org/site/support/legacy/) page to find documentation for the version you are using.

¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²<http://www.openmicroscopy.org/site/support/legacy/>

SUPPORTED FORMATS

Ratings legend and definitions

Format	Extensions	Pixels	Metadata	Openness	Presence	Utility	Export	BSD
<i>3i SlideBook</i>	.sld	▲	▼	▼	▲	▼	✗	✗
<i>3i SlideBook6</i>	.sld	▲	▼	▼	▲	▼	✗	✗
<i>Andor Bio-Imaging Division (ABD) TIFF</i>	.tif	▲	▲	■	▼	■	✗	✗
<i>AIM</i>	.aim	■	▲	▼	▼	▼	✗	✗
<i>Alicona 3D</i>	.al3d	▲	▲	▲	▼	■	✗	✗
<i>Amersham Bio-sciences Gel</i>	.gel	▲	▲	■	▼	▼	✗	✗
<i>Amira Mesh</i>	.am, .ami- ramesh, .grey, .hx, .labels	▲	■	▼	▼	▼	✗	✗
<i>Amnis FlowSight</i>	.cif	■	▼	■	▼	▼	✗	✓
<i>Analyze 7.5</i>	.img, .hdr	▲	■	▲	■	▼	✗	✗
<i>Animated PNG</i>	.png	▲	▲	▲	■	▼	✓	✓
<i>Aperio AFI</i>	.afi, .svs	▲	▲	▲	■	■	✗	✗
<i>Aperio SVS TIFF</i>	.svs	▲	▲	▲	■	■	✗	✗
<i>Applied Precision CellWorX</i>	.htd, .pnl	▲	■	■	▼	▼	✗	✗
<i>AVI (Audio Video Interleave)</i>	.avi	■	▲	▼	▲	▼	✓	✓
<i>Axon Raw Format</i>	.arf	▲	▼	▲	▼	▼	✗	✗
<i>BD Pathway</i>	.exp, .tif	▲	▲	■	▼	■	✗	✗
<i>Becker & Hickl SPCImage</i>	.sdt	▲	▲	■	▼	▼	✗	✗
<i>Bio-Rad Gel</i>	.lsc	■	▼	▼	▼	▼	✗	✗
<i>Bio-Rad PIC</i>	.pic, .raw, .xml	▲	▲	▲	▲	▲	✗	✗
<i>Bio-Rad SCN</i>	.scn	▲	▼	▼	▼	▼	✗	✗
<i>Bitplane Imaris</i>	.ims	▲	▲	■	▼	▼	✗	✗
<i>Bruker MRI</i>		■	▲	▼	■	▼	✗	✗

Continued on next page

Table 17.1 – continued from previous page

Format	Extensions	Pixels	Metadata	Openness	Presence	Utility	Export	BSD
<i>Burleigh</i>	.img							
<i>Canon DNG</i>	.cr2, .crw							
<i>CellH5</i>	.ch5							
<i>Cellomics</i>	.c01							
<i>cellSens VSI</i>	.vsi							
<i>CellVoyager</i>	.xml, .tif							
<i>DeltaVision</i>	.dv, .r3d							
<i>DICOM</i>	.dcm, .dicom							
<i>ECAT7</i>	.v							
<i>EPS (Encapsulated PostScript)</i>	.eps, .epsi, .ps							
<i>Evotec/PerkinElmer Opera Flex</i>	.flex, .mea, .res							
<i>FEI</i>	.img							
<i>FEI TIFF</i>	.tiff							
<i>FITS (Flexible Image Transport System)</i>	.fits							
<i>Gatan Digital Micrograph</i>	.dm3							
<i>Gatan Digital Micrograph 2</i>	.dm2							
<i>GIF (Graphics Interchange Format)</i>	.gif							
<i>Hamamatsu Aqua-cosmos NAF</i>	.naf							
<i>Hamamatsu HIS</i>	.his							
<i>Hamamatsu ndpi</i>	.ndpi							
<i>Hamamatsu VMS</i>	.vms							
<i>Hitachi S-4800</i>	.txt, .tif, .bmp, .jpg							
<i>I2I</i>	.i2i							
<i>ICS (Image Cytometry Standard)</i>	.ics, .ids							
<i>Imacon</i>	.fff							
<i>ImagePro Sequence</i>	.seq							
<i>ImagePro Workspace</i>	.ipw							
<i>IMAGIC</i>	.hed, .img							
<i>IMOD</i>	.mod							
<i>Improvision Openlab LIFF</i>	.liff							

Continued on next page

Table 17.1 – continued from previous page

Format	Extensions	Pixels	Metadata	Openness	Presence	Utility	Export	BSD
<i>Improvision Openlab Raw</i>	.raw	▲	▲	▲	▼	▼	✗	✗
<i>Improvision TIFF</i>	.tif	▲	▲	▲	▼	▲	✗	✗
<i>Imspector OBF</i>	.obf, .msr	▲	▲	▲	▼	▼	✗	✓
<i>InCell 1000</i>	.xdce, .tif	▲	▲	▲	▼	▲	✗	✗
<i>InCell 3000</i>	.frm	▲	▼	▼	▼	▼	✗	✗
<i>INR</i>	.inr	▲	▲	▼	▼	▼	✗	✗
<i>Inveon</i>	.hdr	▲	▲	▲	▼	▼	✗	✗
<i>IPLab</i>	.ipl	▲	▲	▲	▼	▼	✗	✗
<i>IPLab-Mac</i>	.ipm	▲	▲	▲	▼	▼	✗	✗
<i>JEOL</i>	.dat, .img, .par	▲	▼	▼	▼	▼	✗	✗
<i>JPEG</i>	.jpg	▲	▼	▲	▲	▼	✓	✓
<i>JPEG 2000</i>	.jp2	▲	▼	▲	▲	▼	✓	✓
<i>JPk</i>	.jpgk	▲	▼	▼	▼	▼	✗	✗
<i>JPX</i>	.jpx	▲	▲	▲	▲	▼	✗	✗
<i>Khoros VIFF (Visualization Image File Format) Bitmap</i>	.xv	▲	▼	▼	▼	▼	✗	✗
<i>Kodak BIP</i>	.bip	▲	▲	▼	▼	▼	✗	✗
<i>Lambert Instruments FLIM</i>	.fli	▲	▲	▲	▼	▲	✗	✗
<i>LaVision Imspector</i>	.msr	▼	▼	▼	▼	▼	✗	✗
<i>Leica LCS LEI</i>	.lei, .tif	▲	▲	▲	▲	▲	✗	✗
<i>Leica LAS AF LIF (Leica Image File Format)</i>	.lif	▲	▲	▲	▲	▲	✗	✗
<i>Leica SCN</i>	.scn	▲	▲	▲	▼	▲	✗	✗
<i>LEO</i>	.sxm	▲	▼	▲	▼	▼	✗	✗
<i>Li-Cor L2D</i>	.l2d, .tif, .scn	▲	▼	▲	▲	▲	✗	✗
<i>LIM (Laboratory Imaging/Nikon)</i>	.lim	▲	▼	▼	▼	▼	✗	✗
<i>MetaMorph 7.5 TIFF</i>	.tiff	▲	▲	▲	▼	▲	✗	✗
<i>MetaMorph Stack (STK)</i>	.stk, .nd	▲	▲	▲	▲	▲	✗	✗
<i>MIAS (Maia Scientific)</i>	.tif	▲	▼	▼	▼	▼	✗	✗
<i>Micro-Manager</i>	.tif, .txt, .xml	▲	▲	▲	▼	▲	✗	✓
<i>MINC MRI</i>	.mnc	▲	▲	▲	▲	▼	✗	✗
<i>Minolta MRW</i>	.mrw	▲	▲	▼	▼	▼	✗	✗

Continued on next page

Table 17.1 – continued from previous page

Format	Extensions	Pixels	Metadata	Openness	Presence	Utility	Export	BSD
<i>MNG (Multiple-image Network Graphics)</i>	.mng							
<i>Molecular Imaging</i>	.stp							
<i>MRC (Medical Research Council)</i>	.mrc							
<i>NEF (Nikon Electronic Format)</i>	.nef, .tif							
<i>NiFTI</i>	.img, .hdr							
<i>Nikon Elements TIFF</i>	.tiff							
<i>Nikon EZ-C1 TIFF</i>	.tiff							
<i>Nikon NIS-Elements ND2</i>	.nd2							
<i>NRRD (Nearly Raw Raster Data)</i>	.nrrd, .nhdr, .raw, .txt							
<i>Olympus CellR/APL</i>	.apl, .mtb, .tnb, .tif, .obsep							
<i>Olympus FluoView FV1000</i>	.oib, .oif							
<i>Olympus FluoView TIFF</i>	.tif							
<i>Olympus ScanR</i>	.xml, .dat, .tif							
<i>Olympus SIS TIFF</i>	.tiff							
<i>OME-TIFF</i>	.ome.tiff ¹							
<i>OME-XML</i>	.ome ²							
<i>Oxford Instruments</i>	.top							
<i>PCORAW</i>	.pcoraw, .rec							
<i>PCX (PC Paint-brush)</i>	.pcx							
<i>Perkin Elmer Densitometer</i>	.pds							
<i>PerkinElmer Nuance</i>	.im3							
<i>PerkinElmer Operetta</i>	.tiff, .xml							
<i>PerkinElmer Ultra-View</i>	.tif, .2, .3, .4, etc.							
<i>PGM (Portable Gray Map)</i>	.pgm							
<i>Adobe Photoshop PSD</i>	.psd							

Continued on next page

¹<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff/index.html>²<http://www.openmicroscopy.org/site/support/ome-model/ome-xml/index.html>

Table 17.1 – continued from previous page

Format	Extensions	Pixels	Metadata	Openness	Presence	Utility	Export	BSD
<i>Photoshop TIFF</i>	.tif, .tiff							
<i>PicoQuant Bin</i>	.bin							
<i>PICT (Macintosh Picture)</i>	.pict							
<i>PNG (Portable Network Graphics)</i>	.png							
<i>Prairie Technologies TIFF</i>	.tif, .xml, .cfg							
<i>Quesant</i>	.afm							
<i>QuickTime Movie</i>	.mov							
<i>RHK</i>	.sm2, .sm3							
<i>SBIG</i>								
<i>Seiko</i>	.xqd, .xqf							
<i>SimplePCI & HCIImage</i>	.cxd							
<i>SimplePCI & HCIImage TIFF</i>	.tiff							
<i>SM Camera</i>								
<i>SPIDER</i>	.spi, .stk							
<i>Targa</i>	.tga							
<i>Text</i>	.txt							
<i>TIFF (Tagged Image File Format)</i>	.tif							
<i>TillPhotonics TillVision</i>	.vws							
<i>Topometrix</i>	.tfr, .ffr, .zfr, .zfp, .2fl							
<i>Trestle</i>	.tif, .sld, .jpg							
<i>UBM</i>	.pr3							
<i>Unisoku</i>	.dat, .hdr							
<i>Varian FDF</i>	.fdf							
<i>Veeco AFM</i>	.hdf							
<i>VG SAM</i>	.dti							
<i>VisiTech XYS</i>	.xys, .html							
<i>Volocity</i>	.mvd2							
<i>Volocity Library Clipping</i>	.acff							
<i>WA-TOP</i>	.wat							
<i>Windows Bitmap</i>	.bmp							
<i>Woolz</i>	.wlz							
<i>Zeiss Axio CSM</i>	.lms							

Continued on next page

Table 17.1 – continued from previous page

Format	Extensions	Pixels	Metadata	Openness	Presence	Utility	Export	BSD
<i>Zeiss AxioVision TIFF</i>	.xml, .tiff							
<i>Zeiss AxioVision ZVI (Zeiss Vision Image)</i>	.zvi							
<i>Zeiss CZI</i>	.dzi ³							
<i>Zeiss LSM (Laser Scanning Microscope) 510/710</i>	.lsm, .mdb							

Bio-Formats currently supports **143** formats

Ratings legend and definitions

	Outstanding
	Very good
	Good
	Fair
	Poor

Pixels Our estimation of Bio-Formats’ ability to reliably extract complete and accurate pixel values from files in that format. The better this score, the more confident we are that Bio-Formats will successfully read your file without displaying an error message or displaying an erroneous image.

Metadata Our certainty in the thoroughness and correctness of Bio-Formats’ metadata extraction and conversion from files of that format into standard OME-XML. The better this score, the more confident we are that all meaningful metadata will be parsed and populated as OME-XML.

Openness This is not a direct expression of Bio-Formats’ performance, but rather indicates the level of cooperation the format’s controlling interest has demonstrated toward the scientific community with respect to the format. The better this score, the more tools (specification documents, source code, sample files, etc.) have been made available.

Presence This is also not directly related to Bio-Formats, but instead represents our understanding of the format’s popularity, and is also as a measure of compatibility between applications. The better this score, the more common the format and the more software packages include support for it.

Utility Our opinion of the format’s suitability for storing metadata-rich microscopy image data. The better this score, the wider the variety of information that can be effectively stored in the format.

Export This indicates whether Bio-Formats is capable of writing the format (Bio-Formats can read every format on this list).

BSD This indicates whether format is BSD-licensed. By default, format readers and writers are GPL-licensed.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴](#) or the [previous versions⁵](#) page to find documentation for the version you are using.

17.1 3i SlideBook

Extensions: .sld

³<http://www.zeiss.com/czi>


⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵<http://www.openmicroscopy.org/site/support/legacy/>

Developer: [Intelligent Imaging Innovations](#)⁶

Owner: [Intelligent Imaging Innovations](#)⁷

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 4.1, 4.2

Supported Metadata Fields: *3i SlideBook*


We currently have:

- Numerous SlideBook datasets


We would like to have:


- A SlideBook specification document
- More SlideBook datasets (preferably acquired with the most recent SlideBook software)


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [SlidebookReader.java](#)⁸

Notes:

We strongly encourage users to export their .sld files to OME-TIFF using the SlideBook software. Bio-Formats is not likely to support the full range of metadata that is included in .sld files, and so exporting to OME-TIFF from SlideBook is the best way to ensure that all metadata is preserved. Free software from 3I can export the files to OME-TIFF post-acquisition, see <https://www.slidebook.com/reader.php>

See also:

[Slidebook software overview](#)⁹

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁰ or the [previous versions](#)¹¹ page to find documentation for the version you are using.

17.2 3i SlideBook6

Extensions: .sld

Developer: [Intelligent Imaging Innovations](#)¹²

Owner: [Intelligent Imaging Innovations](#)¹³

Support

⁶<http://www.intelligent-imaging.com/>

⁷<http://www.intelligent-imaging.com/>

⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SlidebookReader.java>

⁹<https://www.slidebook.com>

¹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹<http://www.openmicroscopy.org/site/support/legacy/>

¹²<http://www.intelligent-imaging.com/>

¹³<http://www.intelligent-imaging.com/>

BSD-licensed: ❌

Export: ❌

Officially Supported Versions: 4.1, 4.2, 5.0, 5.5, 6.0

Supported Metadata Fields: *3i SlideBook6*

We currently have:

- Numerous SlideBook datasets

We would like to have:

- A SlideBook specification document
- More SlideBook datasets (preferably acquired with the most recent SlideBook software)

Ratings

Pixels: ▲

Metadata: ▼

Openness: ▼

Presence: ▲

Utility: ▼

Additional Information

Source Code: [SlideBook6Reader.java](#)¹⁴

Notes:

As of Bioformats 5.1.2 the native binary file SlideBook6Reader.dll of the proper architecture (x32 or x64) must be in the java binary path for this reader to work. This file is available from [3i Support](#)¹⁵ and is currently only available for Windows systems.

See also:

[Slidebook software overview](#)¹⁶

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)¹⁷ or the [previous versions](#)¹⁸ page to find documentation for the version you are using.

17.3 Andor Bio-Imaging Division (ABD) TIFF

Extensions: .tif

Developer: Andor Bioimaging Department

Owner: [Andor Technology](#)¹⁹

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Andor Bio-Imaging Division (ABD) TIFF*

We currently have:

¹⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SlideBook6Reader.java>

¹⁵support@intelligent-imaging.com

¹⁶<https://www.slidebook.com>

¹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁹<http://www.andor.com/>

- an ABD-TIFF specification document (from 2005 November, in PDF)
- a few ABD-TIFF datasets

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [FluoviewReader.java](#)²⁰

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

With a few minor exceptions, the ABD-TIFF format is identical to the Fluoview TIFF format.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²¹ or the [previous versions](#)²² page to find documentation for the version you are using.

17.4 AIM

Extensions: .aim

Developer: [SCANCO Medical AG](#)²³

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: [AIM](#)

We currently have:

- one .aim file

We would like to have:

- an .aim specification document
- more .aim files

Ratings

Pixels:

Metadata:

Openness:


Presence:

²⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FluoviewReader.java>

²¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²²<http://www.openmicroscopy.org/site/support/legacy/>

²³<http://www.scanco.ch>

Utility: 

Additional Information

Source Code: [AIMReader.java](#)²⁴

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁵ or the [previous versions](#)²⁶ page to find documentation for the version you are using.

17.5 Alicona 3D

Extensions: .al3d

Owner: [Alicona Imaging](#)²⁷

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 1.0

Supported Metadata Fields: [Alicona 3D](#)


We currently have:

- an [AL3D specification document](#)²⁸ (v1.0, from 2003, in PDF)
- a few AL3D datasets


We would like to have:


- more AL3D datasets (Z series, T series, 16-bit)


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [AliconaReader.java](#)²⁹

Notes:

Known deficiencies:

- Support for 16-bit AL3D images is present, but has never been tested.
- Texture data is currently ignored.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁰ or the [previous versions](#)³¹ page to find documentation for the version you are using.

²⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/AIMReader.java>

²⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁶<http://www.openmicroscopy.org/site/support/legacy/>

²⁷<http://www.alicon.com/>

²⁸<http://www.alicon.com/home/fileadmin/alicon/downloads/AL3DFormat.pdf>

²⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/AliconaReader.java>

³⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹<http://www.openmicroscopy.org/site/support/legacy/>


17.6 Amersham Biosciences Gel

Extensions: .gel

Developer: Molecular Dynamics

Owner: [GE Healthcare Life Sciences](#)³²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *Amersham Biosciences Gel*

We currently have:

- a GEL specification document (Revision 2, from 2001 Mar 15, in PDF)
- a few GEL datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [GelReader.java](#)³³

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

See also:

[GEL Technical Overview](#)³⁴

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁵ or the [previous versions](#)³⁶ page to find documentation for the version you are using.

17.7 Amira Mesh

Extensions: .am, .amiramesh, .grey, .hx, .labels

Developer: [Visage Imaging](#)³⁷

Support

³²<http://www.gelifesciences.com/>


³³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/GelReader.java>


³⁴<http://www.awaresystems.be/imaging/tiff/tifftags/docs/gel.html>

³⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁶<http://www.openmicroscopy.org/site/support/legacy/>

³⁷<http://www.amiravis.com/>

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Amira Mesh*


We currently have:

- a few Amira Mesh datasets


We would like to have:


- more Amira Mesh datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [AmiraReader.java](#)³⁸

Notes:


Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)³⁹ or the [previous versions](#)⁴⁰ page to find documentation for the version you are using.

17.8 Amnis FlowSight

Extensions: .cif

Owner: [Amnis](#)⁴¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Amnis FlowSight*

We currently have:

- a few sample datasets

We would like to have:

Ratings

Pixels: 

Metadata: 


Openness: 


³⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/AmiraReader.java>

³⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁴¹<http://www.amnis.com/>

Presence: 

Utility: 

Additional Information

Source Code: [FlowSightReader.java](#)⁴²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴³ or the [previous versions](#)⁴⁴ page to find documentation for the version you are using.

17.9 Analyze 7.5

Extensions: .img, .hdr

Developer: [Mayo Foundation Biomedical Imaging Resource](#)⁴⁵

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: [Analyze 7.5](#)

We currently have:


- [an Analyze 7.5 specification document](#)⁴⁶
- several Analyze 7.5 datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [AnalyzeReader.java](#)⁴⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁸ or the [previous versions](#)⁴⁹ page to find documentation for the version you are using.

⁴²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/FlowSightReader.java>

⁴³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁵<http://www.mayo.edu/bir>

⁴⁶<http://web.archive.org/web/20070927191351/http://www.mayo.edu/bir/PDF/ANALYZE75.pdf>

⁴⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/AnalyzeReader.java>

⁴⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁹<http://www.openmicroscopy.org/site/support/legacy/>

17.10 Animated PNG

Extensions: .png

Developer: [The Animated PNG Project](#)⁵⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Animated PNG*

Freely Available Software:


- [Firefox 3+](#)⁵¹
- [Opera 9.5+](#)⁵²
- [KSquirrel](#)⁵³

We currently have:


- [a specification document](#)⁵⁴
- several APNG files

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [APNGReader.java](#)⁵⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁶ or the [previous versions](#)⁵⁷ page to find documentation for the version you are using.

17.11 Aperio AFI

Extensions: .afi, .svs

Owner: [Aperio](#)⁵⁸

Support

⁵⁰<http://www.animatedpng.com/>

⁵¹<http://www.mozilla.com/firefox>

⁵²<http://www.opera.com/download>

⁵³<http://ksquirrel.sourceforge.net/download.php>

⁵⁴http://wiki.mozilla.org/APNG_Specification

⁵⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/APNGReader.java>

⁵⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁸<http://www.aperio.com/>

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Aperio AFI*

We currently have:

- several AFI datasets

We would like to have:

Ratings

Pixels: 🟢

Metadata: 🟢

Openness: 🟢

Presence: 🟡

Utility: 🟡

Additional Information

Source Code: [AFIReader.java](#)⁵⁹

Notes:

See also:

[Aperio ImageScope](#)⁶⁰

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶¹ or the [previous versions](#)⁶² page to find documentation for the version you are using.

17.12 Aperio SVS TIFF

Extensions: .svs

Owner: [Aperio](#)⁶³

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions: 8.0, 8.2, 9.0

Supported Metadata Fields: *Aperio SVS TIFF*

We currently have:

- many SVS datasets
- an SVS specification document
- the ability to generate additional SVS datasets

⁵⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/AFIReader.java>

⁶⁰<http://www.leicabiosystems.com/index.php?id=8991>

⁶¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶²<http://www.openmicroscopy.org/site/support/legacy/>

⁶³<http://www.aperio.com/>

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [SVSReader.java](#)⁶⁴

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

See also:

[Aperio ImageScope](#)⁶⁵

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁶ or the [previous versions](#)⁶⁷ page to find documentation for the version you are using.

17.13 Applied Precision CellWorX

Extensions: .htd, .pnl

Developer: [Applied Precision](#)⁶⁸

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: [Applied Precision CellWorX](#)

We currently have:

- a few CellWorX datasets

We would like to have:

- a CellWorX specification document
- more CellWorX datasets

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

⁶⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SVSReader.java>

⁶⁵<http://www.leicabiosystems.com/index.php?id=8991>

⁶⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁸<http://www.api.com>

Additional Information

Source Code: [CellWorxReader.java](#)⁶⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁰ or the [previous versions](#)⁷¹ page to find documentation for the version you are using.

17.14 AVI (Audio Video Interleave)

Extensions: .avi

Developer: [Microsoft](#)⁷²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *AVI (Audio Video Interleave)*

Freely Available Software:

- [AVI Reader plugin for ImageJ](#)⁷³
- [AVI Writer plugin for ImageJ](#)⁷⁴


We currently have:

- several AVI datasets

We would like to have:


- more AVI datasets, including:
 - files with audio tracks and/or multiple video tracks
 - files compressed with a common unsupported codec
 - 2+ GB files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [AVIReader.java](#)⁷⁵

Notes:

- Bio-Formats can save image stacks as AVI (uncompressed).

⁶⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/CellWorxReader.java>

⁷⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷¹<http://www.openmicroscopy.org/site/support/legacy/>

⁷²<http://www.microsoft.com/>

⁷³<http://rsb.info.nih.gov/ij/plugins/avi-reader.html>

⁷⁴<http://rsb.info.nih.gov/ij/plugins/avi.html>

⁷⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/AVIReader.java>

- The following codecs are supported for reading:
 - Microsoft Run-Length Encoding (MSRLE)
 - Microsoft Video (MSV1)
 - Raw (uncompressed)
 - JPEG

See also:

[AVI RIFF File Reference](#)⁷⁶ [AVI on Wikipedia](#)⁷⁷


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁸ or the [previous versions](#)⁷⁹ page to find documentation for the version you are using.

17.15 Axon Raw Format

Extensions: .arf

Owner: [INDEC BioSystems](#)⁸⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: [Axon Raw Format](#)


We currently have:

- one ARF dataset
- a [specification document](#)⁸¹

We would like to have:


- more ARF datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [ARFReader.java](#)⁸²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁸³ or the [previous versions](#)⁸⁴ page to find documentation for the version you are using.

⁷⁶<http://msdn2.microsoft.com/en-us/library/ms779636.aspx>

⁷⁷http://en.wikipedia.org/wiki/Audio_Video_Interleave

⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁸⁰<http://www.indecbiosystems.com/>

⁸¹http://www.indecbiosystems.com/imagingworkbench/ApplicationNotes/IWAppNote11-ARF_File_Format.pdf

⁸²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ARFReader.java>

⁸³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁸⁴<http://www.openmicroscopy.org/site/support/legacy/>

17.16 BD Pathway

Extensions: .exp, .tif

Owner: [BD Biosciences](#)⁸⁵

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *BD Pathway*


We currently have:

- a few BD Pathway datasets


We would like to have:


- more BD Pathway datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [BDReader.java](#)⁸⁶

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁸⁷ or the [previous versions](#)⁸⁸ page to find documentation for the version you are using.

17.17 Becker & Hickl SPCImage

Extensions: .sdt

Owner: [Becker-Hickl](#)⁸⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Becker & Hickl SPCImage*

We currently have:

⁸⁵<http://www.bdbiosciences.com>

⁸⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BDReader.java>

⁸⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁸⁹<http://www.becker-hickl.de/>

- an SDT specification document (from 2008 April, in PDF)
- an SDT specification document (from 2006 June, in PDF)
- Becker & Hickl's [SPCImage](#)⁹⁰ software
- a large number of SDT datasets
- the ability to produce new datasets

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [SDTReader.java](#)⁹¹

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁹² or the [previous versions](#)⁹³ page to find documentation for the version you are using.

17.18 Bio-Rad Gel

Extensions: .lsc

Owner: [Bio-Rad](#)⁹⁴

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: *Bio-Rad Gel*

We currently have:

- software that can read Bio-Rad Gel files
- several Bio-Rad Gel files

We would like to have:

- a Bio-Rad Gel specification
- more Bio-Rad Gel files



⁹⁰<http://www.becker-hickl.de/software/tcspc/softwaretcspcspecial.htm>

⁹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SDTReader.java>

⁹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹³<http://www.openmicroscopy.org/site/support/legacy/>

⁹⁴<http://www.bio-rad.com>

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [BioRadGelReader.java](#)⁹⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁹⁶ or the [previous versions](#)⁹⁷ page to find documentation for the version you are using.

17.19 Bio-Rad PIC

Extensions: .pic, .raw, .xml

Developer: Bio-Rad

Owner: [Carl Zeiss, Inc.](#)⁹⁸**Support**BSD-licensed: Export: 

Officially Supported Versions:

Supported Metadata Fields: *Bio-Rad PIC*


Freely Available Software:

- [Bio-Rad PIC reader plugin for ImageJ](#)⁹⁹

We currently have:

- a PIC specification document (v4.5, in PDF)
- an older PIC specification document (v4.2, from 1996 December 16, in DOC)
- a large number of PIC datasets
- the ability to produce new datasets

We would like to have:

RatingsPixels: Metadata: Openness: Presence: Utility: 

⁹⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BioRadGelReader.java>

⁹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁹⁸<http://www.zeiss.com/>

⁹⁹<http://rsb.info.nih.gov/ij/plugins/biorad.html>

Additional Information

Source Code: [BioRadReader.java](#)¹⁰⁰

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

- Commercial applications that support this format include:
 - [Bitplane Imaris](#)¹⁰¹
 - [SVI Huygens](#)¹⁰²

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)¹⁰³ or the [previous versions](#)¹⁰⁴ page to find documentation for the version you are using.


17.20 Bio-Rad SCN

Extensions: .scn

Developer: Bio-Rad

Owner: [Bio-Rad](#)¹⁰⁵

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *Bio-Rad SCN*

We currently have:

- a few Bio-Rad .scn files

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [BioRadSCNReader.java](#)¹⁰⁶

Notes:

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)¹⁰⁷ or the [previous versions](#)¹⁰⁸ page to find documentation for the version you are using.

¹⁰⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BioRadReader.java>

¹⁰¹<http://www.bitplane.com/>

¹⁰²<http://svi.nl/>

¹⁰³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰⁴<http://www.openmicroscopy.org/site/support/legacy/>

¹⁰⁵<http://www.bio-rad.com>

¹⁰⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BioRadSCNReader.java>

¹⁰⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


¹⁰⁸<http://www.openmicroscopy.org/site/support/legacy/>

17.21 Bitplane Imaris

Extensions: .ims

Owner: [Bitplane](#)¹⁰⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 2.7, 3.0, 5.5

Supported Metadata Fields: *Bitplane Imaris*


We currently have:

- an *Imaris (RAW)* specification document¹¹⁰ (from no later than 1997 November 11, in HTML)
- an Imaris 5.5 (HDF) specification document
- Bitplane's `bfFileReaderImaris3N` code (from no later than 2005, in C++)
- several older Imaris (RAW) datasets
- one Imaris 3 (TIFF) dataset
- several Imaris 5.5 (HDF) datasets


We would like to have:


- an Imaris 3 (TIFF) specification document
- more Imaris 3 (TIFF) datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [ImarisHDFReader.java](#)¹¹¹, [ImarisTiffReader.java](#)¹¹², [ImarisReader.java](#)¹¹³

Notes:

- **There are three distinct Imaris formats:**
 1. the old binary format (introduced in Imaris version 2.7)
 2. Imaris 3, a TIFF variant (introduced in Imaris version 3.0)
 3. Imaris 5.5, an HDF variant (introduced in Imaris version 5.5)

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹¹⁴ or the [previous versions](#)¹¹⁵ page to find documentation for the version you are using.

¹⁰⁹<http://www.bitplane.com/>

¹¹⁰<http://flash.bitplane.com/wda/interfaces/public/faqs/faqsview.cfm?inCat=0&inQuestionID=104>

¹¹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImarisHDFReader.java>

¹¹²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImarisTiffReader.java>

¹¹³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImarisReader.java>


¹¹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹⁵<http://www.openmicroscopy.org/site/support/legacy/>

17.22 Bruker MRI

Developer: [Bruker](#)¹¹⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Bruker MRI*

Freely Available Software:

- [Bruker plugin for ImageJ](#)¹¹⁷


We currently have:

- a few Bruker MRI datasets

We would like to have:

- an official specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [BrukerReader.java](#)¹¹⁸

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹¹⁹ or the [previous versions](#)¹²⁰ page to find documentation for the version you are using.

17.23 Burleigh

Extensions: .img

Owner: Burleigh Instruments

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Burleigh*

We currently have:

¹¹⁶<http://www.bruker.com/>

¹¹⁷<http://rsbweb.nih.gov/ij/plugins/bruker.html>

¹¹⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BrukerReader.java>

¹¹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


¹²⁰<http://www.openmicroscopy.org/site/support/legacy/>

- Pascal code that can read Burleigh files (from ImageSXM)
- a few Burleigh files


We would like to have:


- a Burleigh file format specification
- more Burleigh files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [BurleighReader.java](#)¹²¹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹²² or the [previous versions](#)¹²³ page to find documentation for the version you are using.

17.24 Canon DNG

Extensions: .cr2, .crw

Developer: [Canon](#)¹²⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Canon DNG*

Freely Available Software:

- [IrfanView](#)¹²⁵


We currently have:

- a few example datasets

We would like to have:

- an official specification document

Ratings

Pixels: 

Metadata: 

Openness: 


¹²¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BurleighReader.java>


¹²²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹²³<http://www.openmicroscopy.org/site/support/legacy/>

¹²⁴<http://canon.com>

¹²⁵<http://www.irfanview.com/>

Presence: 

Utility: 

Additional Information

Source Code: [DNNGReader.java](#)¹²⁶

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹²⁷ or the [previous versions](#)¹²⁸ page to find documentation for the version you are using.

17.25 CellH5

Extensions: .ch5

Developer: [CellH5](#)¹²⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: [CellH5](#)

Freely Available Software:


- [CellH5](#)¹³⁰

We currently have:


- a few CellH5 datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [CellH5Reader.java](#)¹³¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹³² or the [previous versions](#)¹³³ page to find documentation for the version you are using.

¹²⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/DNNGReader.java>

¹²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹²⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹²⁹<http://cellh5.org/>

¹³⁰<http://cellh5.org/>

¹³¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/CellH5Reader.java>

¹³²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³³<http://www.openmicroscopy.org/site/support/legacy/>

17.26 Cellomics

Extensions: .c01

Developer: [Thermo Fisher Scientific](#)¹³⁴

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Cellomics*

We currently have:

- a few Cellomics .c01 datasets

We would like to have:

- a Cellomics .c01 specification document
- more Cellomics .c01 datasets

Ratings

Pixels: ▲

Metadata: ▼

Openness: ▼

Presence: ▼

Utility: ▼

Additional Information

Source Code: [CellomicsReader.java](#)¹³⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹³⁶ or the [previous versions](#)¹³⁷ page to find documentation for the version you are using.

17.27 cellSens VSI

Extensions: .vsi

Developer: [Olympus](#)¹³⁸

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *cellSens VSI*

We currently have:

¹³⁴<http://www.thermofisher.com/>

¹³⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/CellomicsReader.java>

¹³⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³⁷<http://www.openmicroscopy.org/site/support/legacy/>


¹³⁸<http://www.olympus.com/>

- a few example datasets

We would like to have:

- an official specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [CellSensReader.java](#)¹³⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁴⁰ or the [previous versions](#)¹⁴¹ page to find documentation for the version you are using.

17.28 CellVoyager

Extensions: .xml, .tif

Owner: [Yokogawa](#)¹⁴²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *CellVoyager*

We currently have:

- a few example datasets

We would like to have:

Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [CellVoyagerReader.java](#)¹⁴³

Notes:

¹³⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/CellSensReader.java>

¹⁴⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁴¹<http://www.openmicroscopy.org/site/support/legacy/>

¹⁴²<http://www.yokogawa.com/>

¹⁴³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/CellVoyagerReader.java>


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁴⁴](#) or the [previous versions¹⁴⁵](#) page to find documentation for the version you are using.

17.29 DeltaVision

Extensions: .dv, .r3d

Owner: GE Healthcare (formerly Applied Precision)¹⁴⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *DeltaVision*

Freely Available Software:


- [DeltaVision Opener plugin for ImageJ¹⁴⁷](#)

We currently have:

- a DV specification document (v2.10 or newer, in HTML)
- numerous DV datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [DeltavisionReader.java¹⁴⁸](#)

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

- The Deltavision format is based on the Medical Research Council (MRC) file format.
- Commercial applications that support DeltaVision include:
 - [Bitplane Imaris¹⁴⁹](#)
 - [SVI Huygens¹⁵⁰](#)
 - [Image-Pro Plus¹⁵¹](#)

¹⁴⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁴⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹⁴⁶<http://www.gelifesciences.com/webapp/wcs/stores/servlet/catalog/en/GELifeSciences-UK/brands/deltavision/>

¹⁴⁷<http://rsb.info.nih.gov/ij/plugins/track/delta.html>

¹⁴⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/DeltavisionReader.java>

¹⁴⁹<http://www.bitplane.com/>

¹⁵⁰<http://svi.nl/>

¹⁵¹<http://www.mediacy.com/>


Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁵² or the previous versions¹⁵³ page to find documentation for the version you are using.

17.30 DICOM

Extensions: .dcm, .dicom

Developer: National Electrical Manufacturers Association¹⁵⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *DICOM*

Freely Available Software:

- OsiriX Medical Imaging Software¹⁵⁵
- ezDICOM¹⁵⁶
- Wikipedia's list of freeware health software¹⁵⁷

Sample Datasets:

- MRI Chest from FreeVol-3D web site¹⁵⁸
- Medical Image Samples from Sebastien Barre's Medical Imaging page¹⁵⁹
- DICOM sample image sets from OsiriX web site¹⁶⁰

We currently have:

- DICOM specification documents¹⁶¹ (PS 3 - 2007, from 2006 December 28, in DOC and PDF)
- numerous DICOM datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [DicomReader.java](#)¹⁶²

Notes:

¹⁵²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁵³<http://www.openmicroscopy.org/site/support/legacy/>

¹⁵⁴<http://www.nema.org/>

¹⁵⁵<http://www.osirix-viewer.com/>

¹⁵⁶<http://www.sph.sc.edu/comd/rorden/ezdicom.html>

¹⁵⁷http://en.wikipedia.org/wiki/List_of_freeware_health_software#Imaging.2FVisualization

¹⁵⁸http://members.tripod.com/%7Eclunis_immensus/free3d/hk-40.zip

¹⁵⁹<http://www.barre.nom.fr/medical/samples/>

¹⁶⁰<http://osirix-viewer.com/datasets/>

¹⁶¹<http://medical.nema.org/dicom/2007/>

¹⁶²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/DicomReader.java>

- DICOM stands for “Digital Imaging and Communication in Medicine”.
- Bio-Formats supports both compressed and uncompressed DICOM files.

If you have a problematic DICOM file which you cannot send us for privacy reasons, please send us the exact error message and be aware that it may take several attempts to fix the problem blind.

See also:

[DICOM homepage](#)¹⁶³


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁶⁴ or the [previous versions](#)¹⁶⁵ page to find documentation for the version you are using.

17.31 ECAT7

Extensions: .v

Developer: [Siemens](#)¹⁶⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: [ECAT7](#)


We currently have:

- a few ECAT7 files

We would like to have:

- an ECAT7 specification document
- more ECAT7 files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [Ecat7Reader.java](#)¹⁶⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁶⁸ or the [previous versions](#)¹⁶⁹ page to find documentation for the version you are using.

¹⁶³<http://medical.nema.org/>

¹⁶⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁶⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹⁶⁶<http://www.siemens.com>

¹⁶⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/Ecat7Reader.java>

¹⁶⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


¹⁶⁹<http://www.openmicroscopy.org/site/support/legacy/>

17.32 EPS (Encapsulated PostScript)

Extensions: .eps, .epsi, .ps

Developer: Adobe¹⁷⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *EPS (Encapsulated PostScript)*

Freely Available Software:


- [EPS Writer plugin for ImageJ](#)¹⁷¹

We currently have:

- a few EPS datasets
- the ability to produce new datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [EPSReader.java](#)¹⁷² Source Code: [EPSWriter.java](#)¹⁷³

Notes:

- Bio-Formats can save individual planes as EPS.
- Certain types of compressed EPS files are not supported.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁷⁴ or the [previous versions](#)¹⁷⁵ page to find documentation for the version you are using.

17.33 Evotec/PerkinElmer Opera Flex

Extensions: .flex, .mea, .res

Developer: [Evotec Technologies](#), now [PerkinElmer](#)¹⁷⁶

Support

BSD-licensed: 

¹⁷⁰<http://www.adobe.com/>

¹⁷¹<http://rsb.info.nih.gov/ij/plugins/eps-writer.html>

¹⁷²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/EPSReader.java>

¹⁷³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/EPSWriter.java>

¹⁷⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁷⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹⁷⁶<http://www.perkinelmer.com/>

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Evotec/PerkinElmer Opera Flex*

We currently have:

- many Flex datasets


We would like to have:


- a freely redistributable LuraWave LWF decoder


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [FlexReader.java](#)¹⁷⁷

Notes:

The LuraWave LWF decoder library (i.e. lwf_jsdk2.6.jar) with license code is required to decode wavelet-compressed Flex files.

See also:

[LuraTech \(developers of the proprietary LuraWave LWF compression used for Flex image planes\)](#)¹⁷⁸


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁷⁹ or the [previous versions](#)¹⁸⁰ page to find documentation for the version you are using.

17.34 FEI

Extensions: .img

Developer: [FEI](#)¹⁸¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *FEI*

We currently have:

- a few FEI files

We would like to have:

- a specification document
- more FEI files






¹⁷⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FlexReader.java>

¹⁷⁸<http://www.luratech.com/>

¹⁷⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁸⁰<http://www.openmicroscopy.org/site/support/legacy/>

¹⁸¹<http://www.fei.com/>


RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [FEIReader.java](#)¹⁸²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁸³ or the [previous versions](#)¹⁸⁴ page to find documentation for the version you are using.

17.35 FEI TIFF

Extensions: .tiff

Developer: [FEI](#)¹⁸⁵**Support**BSD-licensed: Export: 




Officially Supported Versions:

Supported Metadata Fields: *FEI TIFF*

We currently have:

- a few FEI TIFF datasets

We would like to have:

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [FEITiffReader.java](#)¹⁸⁶

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁸⁷ or the [previous versions](#)¹⁸⁸ page to find documentation for the version you are using.


¹⁸²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FEIReader.java>¹⁸³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>¹⁸⁴<http://www.openmicroscopy.org/site/support/legacy/>¹⁸⁵<http://www.fei.com>¹⁸⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FEITiffReader.java>¹⁸⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>¹⁸⁸<http://www.openmicroscopy.org/site/support/legacy/>

17.36 FITS (Flexible Image Transport System)

Extensions: .fits

Developer: [National Radio Astronomy Observatory](#)¹⁸⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *FITS (Flexible Image Transport System)*

We currently have:


- a [FITS specification document](#)¹⁹⁰ (NOST 100-2.0, from 1999 March 29, in HTML)
- several FITS datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [FitsReader.java](#)¹⁹¹

Notes:

See also:

[MAST:FITS homepage](#)¹⁹² [FITS Support Office](#)¹⁹³

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁹⁴ or the [previous versions](#)¹⁹⁵ page to find documentation for the version you are using.

17.37 Gatan Digital Micrograph

Extensions: .dm3

Owner: [Gatan](#)¹⁹⁶

Support

BSD-licensed: 

¹⁸⁹<http://www.nrao.edu/>

¹⁹⁰http://archive.stsci.edu/fits/fits_standard/

¹⁹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/FitsReader.java>

¹⁹²<http://archive.stsci.edu/fits/>

¹⁹³<http://fits.gsfc.nasa.gov/>

¹⁹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹⁹⁶<http://www.gatan.com/>

Export: 

Officially Supported Versions: 3

Supported Metadata Fields: *Gatan Digital Micrograph*

Freely Available Software:

- [DM3 Reader plugin for ImageJ](#)¹⁹⁷
- [EMAN](#)¹⁹⁸


We currently have:

- Gatan's ImageReader2003 code (from 2003, in C++)
- numerous DM3 datasets


We would like to have:

- a DM3 specification document

Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [GatanReader.java](#)¹⁹⁹

Notes:

Commercial applications that support .dm3 files include [Datasqueeze](#)²⁰⁰.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁰¹ or the [previous versions](#)²⁰² page to find documentation for the version you are using.

17.38 Gatan Digital Micrograph 2

Extensions: .dm2

Developer: [Gatan](#)²⁰³

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 2

Supported Metadata Fields: *Gatan Digital Micrograph 2*

We currently have:

- Pascal code that can read DM2 files (from ImageSXM)

¹⁹⁷http://rsb.info.nih.gov/ij/plugins/DM3_Reader.html

¹⁹⁸<http://blake.bcm.edu/EMAN/>

¹⁹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/GatanReader.java>

²⁰⁰<http://www.datasqueezesoftware.com/>

²⁰¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁰²<http://www.openmicroscopy.org/site/support/legacy/>


²⁰³<http://www.gatan.com>

- a few DM2 files


We would like to have:

- an official DM2 specification document
- more DM2 files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [GatanDM2Reader.java](#)²⁰⁴

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁰⁵ or the [previous versions](#)²⁰⁶ page to find documentation for the version you are using.

17.39 GIF (Graphics Interchange Format)

Extensions: .gif

Developer: [CompuServe](#)²⁰⁷

Owner: [Unisys](#)²⁰⁸

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *GIF (Graphics Interchange Format)*

Freely Available Software:

- [Animated GIF Reader plugin for ImageJ](#)²⁰⁹
- [GIF Stack Writer plugin for ImageJ](#)²¹⁰

We currently have:

- a [GIF specification document](#)²¹¹ (Version 89a, from 1990, in HTML)
- numerous GIF datasets
- the ability to produce new datasets

²⁰⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/GatanDM2Reader.java>

²⁰⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁰⁶<http://www.openmicroscopy.org/site/support/legacy/>

²⁰⁷<http://www.compuserve.com/>

²⁰⁸<http://www.unisys.com/>

²⁰⁹<http://rsb.info.nih.gov/ij/plugins/agr.html>

²¹⁰<http://rsb.info.nih.gov/ij/plugins/gif-stack-writer.html>

²¹¹<http://tronche.com/computer-graphics/gif/>

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [GIFReader.java](#)²¹²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²¹³ or the [previous versions](#)²¹⁴ page to find documentation for the version you are using.

17.40 Hamamatsu Aquacosmos NAF

Extensions: .naf

Developer: [Hamamatsu](#)²¹⁵

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: *Hamamatsu Aquacosmos NAF*

We currently have:

- a few NAF files

We would like to have:

- a specification document
- more NAF files

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [NAFReader.java](#)²¹⁶

Notes:

²¹²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/GIFReader.java>

²¹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²¹⁴<http://www.openmicroscopy.org/site/support/legacy/>

²¹⁵<http://www.hamamatsu.com/>

²¹⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NAFReader.java>


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²¹⁷](#) or the [previous versions²¹⁸](#) page to find documentation for the version you are using.

17.41 Hamamatsu HIS

Extensions: .his

Owner: [Hamamatsu²¹⁹](#)

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Hamamatsu HIS*


We currently have:

- Pascal code that can read HIS files (from ImageSXM)
- several HIS files


We would like to have:


- an HIS specification
- more HIS files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [HISReader.java²²⁰](#)

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²²¹](#) or the [previous versions²²²](#) page to find documentation for the version you are using.

17.42 Hamamatsu ndpi

Extensions: .ndpi

Developer: [Hamamatsu²²³](#)

Support

²¹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²¹⁸<http://www.openmicroscopy.org/site/support/legacy/>

²¹⁹<http://www.hamamatsu.com>

²²⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/HISReader.java>

²²¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²²²<http://www.openmicroscopy.org/site/support/legacy/>

²²³<http://www.hamamatsu.com>

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Hamamatsu ndpi*

Freely Available Software:

- [NDP.view](#)²²⁴

Sample Datasets:

- [OpenSlide](#)²²⁵

We currently have:

- many example datasets

We would like to have:

- an official specification document

Ratings

Pixels: 🟡

Metadata: 🟡

Openness: 🟡

Presence: 🟡

Utility: 🟡

Additional Information

Source Code: [NDPIReader.java](#)²²⁶

Notes:

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)²²⁷ or the [previous versions](#)²²⁸ page to find documentation for the version you are using.

17.43 Hamamatsu VMS

Extensions: .vms

Developer: [Hamamatsu](#)²²⁹

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Hamamatsu VMS*

Sample Datasets:

- [OpenSlide](#)²³⁰

²²⁴http://www.olympusamerica.com/seg_section/seg_vm_downloads.asp

²²⁵<http://openslide.cs.cmu.edu/download/openslide-testdata/Hamamatsu/>

²²⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NDPIReader.java>

²²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²²⁸<http://www.openmicroscopy.org/site/support/legacy/>

²²⁹<http://www.hamamatsu.com>

²³⁰<http://openslide.cs.cmu.edu/download/openslide-testdata/Hamamatsu-vms/>

We currently have:


- a few example datasets
- [developer documentation from the OpenSlide project](#)²³¹


We would like to have:


- an official specification document
- more example datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [HamamatsuVMSReader.java](#)²³²

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²³³ or the [previous versions](#)²³⁴ page to find documentation for the version you are using.

17.44 Hitachi S-4800

Extensions: .txt, .tif, .bmp, .jpg

Developer: [Hitachi](#)²³⁵

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: [Hitachi S-4800](#)

We currently have:


- several Hitachi S-4800 datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

²³¹<http://openslide.org/Hamamatsu%20format/>

²³²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/HamamatsuVMSReader.java>

²³³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²³⁴<http://www.openmicroscopy.org/site/support/legacy/>

²³⁵http://www.hitachi-hta.com/sites/default/files/technotes/Hitachi_4800_STEM.pdf

Additional Information

Source Code: [HitachiReader.java](#)²³⁶

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²³⁷ or the [previous versions](#)²³⁸ page to find documentation for the version you are using.

17.45 I2I

Extensions: .i2i

Developer: [Biomedical Imaging Group, UMass Medical School](#)²³⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: [I2I](#)

We currently have:

- several example datasets
- a specification document
- an ImageJ plugin that can read I2I data


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [I2IReader.java](#)²⁴⁰

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁴¹ or the [previous versions](#)²⁴² page to find documentation for the version you are using.

²³⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/HitachiReader.java>

²³⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²³⁸<http://www.openmicroscopy.org/site/support/legacy/>

²³⁹<http://invitro.umassmed.edu/>

²⁴⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/I2IReader.java>

²⁴¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴²<http://www.openmicroscopy.org/site/support/legacy/>

17.46 ICS (Image Cytometry Standard)

Extensions: .ics, .ids

Developer: P. Dean et al.

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 1.0, 2.0

Supported Metadata Fields: *ICS (Image Cytometry Standard)*

Freely Available Software:


- [Libics \(ICS reference library\)](#)²⁴³
- [ICS Opener plugin for ImageJ](#)²⁴⁴
- [IrfanView](#)²⁴⁵

We currently have:

- numerous ICS datasets

We would like to have:

Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [ICSReader.java](#)²⁴⁶ Source Code: [ICSWriter.java](#)²⁴⁷

Notes:

- ICS version 1.0 datasets have two files - an .ics file that contains all of the metadata in plain-text format, and an .ids file that contains all of the pixel data.
- ICS version 2.0 datasets are a single .ics file that contains both pixels and metadata.

Commercial applications that can support ICS include:

- [Bitplane Imaris](#)²⁴⁸
- [SVI Huygens](#)²⁴⁹

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁵⁰ or the [previous versions](#)²⁵¹ page to find documentation for the version you are using.

²⁴³<http://libics.sourceforge.net/>

²⁴⁴http://valelab.ucsf.edu/%7Enstuurman/IJplugins/Ics_Opener.html

²⁴⁵<http://www.irfanview.com/>

²⁴⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/ICSReader.java>

²⁴⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/ICSWriter.java>

²⁴⁸<http://www.bitplane.com/>

²⁴⁹<http://svi.nl/>

²⁵⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁵¹<http://www.openmicroscopy.org/site/support/legacy/>

17.47 Imacon

Extensions: .fff

Owner: Hasselblad²⁵²

Support

BSD-licensed: ✖

Export: ✖

Officially Supported Versions:

Supported Metadata Fields: *Imacon*

We currently have:

- one Imacon file

We would like to have:

- more Imacon files

Ratings

Pixels: 🚩

Metadata: 🟡

Openness: 🟡

Presence: 🚩

Utility: 🟡

Additional Information

Source Code: *ImaconReader.java*²⁵³

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁵⁴ or the previous versions²⁵⁵ page to find documentation for the version you are using.

17.48 ImagePro Sequence

Extensions: .seq

Owner: Media Cybernetics²⁵⁶

Support

BSD-licensed: ✖

Export: ✖

Officially Supported Versions:

Supported Metadata Fields: *ImagePro Sequence*

We currently have:

- the *Image-Pro Plus*²⁵⁷ software

²⁵²<http://www.hasselbladusa.com/>

²⁵³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImaconReader.java>

²⁵⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁵⁵<http://www.openmicroscopy.org/site/support/legacy/>

²⁵⁶<http://www.mediacy.com/>

²⁵⁷<http://www.mediacy.com/index.aspx?page=IPP>

- a few SEQ datasets
- the ability to produce more datasets

We would like to have:

- an official SEQ specification document

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [SEQReader.java](#)²⁵⁸

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁵⁹ or the [previous versions](#)²⁶⁰ page to find documentation for the version you are using.

17.49 ImagePro Workspace

Extensions: .ipw

Owner: [Media Cybernetics](#)²⁶¹

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: *ImagePro Workspace*

We currently have:

- the [Image-Pro Plus](#)²⁶² software
- a few IPW datasets
- the ability to produce more datasets

We would like to have:

- an official IPW specification document
- more IPW datasets:
 - multiple datasets in one file
 - 2+ GB files





²⁵⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SEQReader.java>

²⁵⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁶⁰<http://www.openmicroscopy.org/site/support/legacy/>

²⁶¹<http://www.mediacy.com/>

²⁶²<http://www.mediacy.com/index.aspx?page=IPP>

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [IPWReader.java](#)²⁶³


Notes:

Bio-Formats uses a modified version of the [Apache Jakarta POI](#)²⁶⁴ library to read IPW files.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁶⁵ or the [previous versions](#)²⁶⁶ page to find documentation for the version you are using.

17.50 IMAGIC

Extensions: .hed, .img

Developer: [Image Science](#)²⁶⁷**Support**BSD-licensed: Export: 

Officially Supported Versions:

Supported Metadata Fields: *IMAGIC*

Freely Available Software:




- [em2em](#)²⁶⁸

We currently have:

- one example dataset
- official file format documentation

We would like to have:

- more example datasets

RatingsPixels: Metadata: Openness: Presence: Utility: 

²⁶³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/IPWReader.java>²⁶⁴<http://jakarta.apache.org/poi/>²⁶⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>²⁶⁶<http://www.openmicroscopy.org/site/support/legacy/>²⁶⁷<http://www.imagescience.de>²⁶⁸<http://www.imagescience.de/em2em.html>

Additional Information

Source Code: [ImagicReader.java](#)²⁶⁹

Notes:

See also:

[IMAGIC specification](#)²⁷⁰

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁷¹ or the [previous versions](#)²⁷² page to find documentation for the version you are using.


17.51 IMOD

Extensions: .mod

Developer: [Boulder Laboratory for 3-Dimensional Electron Microscopy of Cells](#)²⁷³

Owner: [Boulder Laboratory for 3-Dimensional Electron Microscopy of Cells](#)²⁷⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *IMOD*

Freely Available Software:


- [IMOD](#)²⁷⁵

We currently have:


- a few sample datasets
- [official documentation](#)²⁷⁶


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [IMODReader.java](#)²⁷⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁷⁸ or the [previous](#)

²⁶⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImagicReader.java>

²⁷⁰<http://www.imagescience.de/em2em.html>

²⁷¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁷²<http://www.openmicroscopy.org/site/support/legacy/>

²⁷³<http://bio3d.colorado.edu>

²⁷⁴<http://bio3d.colorado.edu>

²⁷⁵<http://bio3d.colorado.edu/imod/>

²⁷⁶<http://bio3d.colorado.edu/imod/doc/binspec.html>

²⁷⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/IMODReader.java>

[versions](#)²⁷⁹ page to find documentation for the version you are using.

17.52 Improvise Openlab LIFF

Extensions: .liff

Developer: [Improvise](#)²⁸⁰

Owner: [PerkinElmer](#)²⁸¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 2.0, 5.0

Supported Metadata Fields: *Improvise Openlab LIFF*


We currently have:

- an Openlab specification document (from 2000 February 8, in DOC)
- Improvise's XLIFFFileImporter code for reading Openlab LIFF v5 files (from 2006, in C++)
- several Openlab datasets

We would like to have:

- more Openlab datasets (preferably with 32-bit integer data)


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [OpenlabReader.java](#)²⁸²

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

See also:

[Openlab software review](#)²⁸³

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁸⁴ or the [previous versions](#)²⁸⁵ page to find documentation for the version you are using.

²⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

²⁸⁰<http://www.improvise.com/>

²⁸¹<http://www.perkinelmer.com/>

²⁸²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/OpenlabReader.java>

²⁸³<http://www.improvise.com/products/openlab/>

²⁸⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁸⁵<http://www.openmicroscopy.org/site/support/legacy/>


17.53 Improvise Openlab Raw

Extensions: .raw

Developer: [Improvise](#)²⁸⁶

Owner: [PerkinElmer](#)²⁸⁷

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *Improvise Openlab Raw*

We currently have:

- an [Openlab Raw specification document](#)²⁸⁸ (from 2004 November 09, in HTML)
- a few Openlab Raw datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [OpenlabRawReader.java](#)²⁸⁹

Notes:

See also:

[Openlab software review](#)²⁹⁰

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁹¹ or the [previous versions](#)²⁹² page to find documentation for the version you are using.

17.54 Improvise TIFF

Extensions: .tif

Developer: [Improvise](#)²⁹³

Owner: [PerkinElmer](#)²⁹⁴

Support

²⁸⁶<http://www.improvise.com/>

²⁸⁷<http://www.perkinelmer.com/>

²⁸⁸http://cellularimaging.perkinelmer.com/support/technical_notes/detail.php?id=344

²⁸⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/OpenlabRawReader.java>


²⁹⁰<http://www.improvise.com/products/openlab/>

²⁹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁹²<http://www.openmicroscopy.org/site/support/legacy/>

²⁹³<http://www.improvise.com/>

²⁹⁴<http://www.perkinelmer.com/>

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *Improvision TIFF*

We currently have:


- an Improvision TIFF specification document
- a few Improvision TIFF datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [ImprovisionTiffReader.java](#)²⁹⁵

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

See also:

[Openlab software overview](#)²⁹⁶

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁹⁷ or the [previous versions](#)²⁹⁸ page to find documentation for the version you are using.


17.55 Inspector OBF

Extensions: .obf, .msr

Developer: [Department of NanoBiophotonics, MPI-BPC](#)²⁹⁹

Owner: [MPI-BPC](#)³⁰⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Inspector OBF*

We currently have:

- a few .msr datasets

²⁹⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImprovisionTiffReader.java>

²⁹⁶<http://www.improvision.com/products/openlab/>

²⁹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁹⁸<http://www.openmicroscopy.org/site/support/legacy/>

²⁹⁹<https://inspector.mpibpc.mpg.de/index.html>

³⁰⁰<http://www.mpibpc.mpg.de/>

- a specification document³⁰¹

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [OBFReader.java](#)³⁰²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁰³ or the [previous versions](#)³⁰⁴ page to find documentation for the version you are using.

17.56 InCell 1000

Extensions: .xdce, .tif

Developer: [GE](#)³⁰⁵

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: *InCell 1000*

We currently have:

- a few InCell 1000 datasets

We would like to have:

- an InCell 1000 specification document
- more InCell 1000 datasets

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

³⁰¹<https://imspector.mpibpc.mpg.de/documentation/fileformat.html>

³⁰²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/OBFReader.java>

³⁰³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰⁴<http://www.openmicroscopy.org/site/support/legacy/>

³⁰⁵<http://gelifesciences.com/>

Source Code: [InCellReader.java](#)³⁰⁶

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁰⁷ or the [previous versions](#)³⁰⁸ page to find documentation for the version you are using.

17.57 InCell 3000

Extensions: .frm

Developer: [GE](#)³⁰⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *InCell 3000*

Sample Datasets:

- [Broad Bioimage Benchmark Collection](#)³¹⁰


We currently have:

- a few example datasets


We would like to have:


- an official specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [InCell3000Reader.java](#)³¹¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³¹² or the [previous versions](#)³¹³ page to find documentation for the version you are using.

³⁰⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/InCellReader.java>

³⁰⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰⁸<http://www.openmicroscopy.org/site/support/legacy/>

³⁰⁹<http://gelifesciences.com/>

³¹⁰<http://www.broadinstitute.org/bbbc/BBBC013/>

³¹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/InCell3000Reader.java>


³¹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹³<http://www.openmicroscopy.org/site/support/legacy/>

17.58 INR

Extensions: .inr

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *INR*

We currently have:


- several sample .inr datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [INRReader.java](#)³¹⁴


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³¹⁵ or the [previous versions](#)³¹⁶ page to find documentation for the version you are using.

17.59 Inveon

Extensions: .hdr

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Inveon*

We currently have:

a few Inveon datasets

We would like to have:

Ratings




Pixels: 

Metadata: 

³¹⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/INRReader.java>

³¹⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹⁶<http://www.openmicroscopy.org/site/support/legacy/>

Openness: Presence: Utility: **Additional Information**Source Code: [InveonReader.java](#)³¹⁷


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³¹⁸ or the [previous versions](#)³¹⁹ page to find documentation for the version you are using.

17.60 IPLab

Extensions: .ipl

Developer: Scanalytics

Owner: was [BD Biosystems](#)³²⁰, now [BioVision Technologies](#)³²¹**Support**BSD-licensed: Export: 

Officially Supported Versions:

Supported Metadata Fields: *IPLab*

Freely Available Software:




- [IPLab Reader plugin for ImageJ](#)³²²

We currently have:

- an IPLab specification document (v3.6.5, from 2004 December 1, in PDF)
- several IPLab datasets

We would like to have:

- more IPLab datasets (preferably with 32-bit integer or floating point data)

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [IPLabReader.java](#)³²³

Notes:

³¹⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/InveonReader.java>

³¹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹⁹<http://www.openmicroscopy.org/site/support/legacy/>

³²⁰<http://www.bdbiosciences.com/>

³²¹<http://www.biovis.com/iplab.htm>

³²²<http://rsb.info.nih.gov/ij/plugins/iplab-reader.html>

³²³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/IPLabReader.java>

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

Commercial applications that support IPLab include:

- Bitplane Imaris³²⁴
- SVI Huygens³²⁵

See also:

IPLab software review³²⁶

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³²⁷ or the previous versions³²⁸ page to find documentation for the version you are using.

17.61 IPLab-Mac

Extensions: .ipm

Owner: BioVision Technologies³²⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *IPLab-Mac*

We currently have:

- a few IPLab-Mac datasets
- a specification document

We would like to have:

- more IPLab-Mac datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: *IvisionReader.java*³³⁰

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³³¹ or the previous versions³³² page to find documentation for the version you are using.

³²⁴<http://www.bitplane.com/>

³²⁵<http://svi.nl/>

³²⁶<http://www.biovis.com/iplab.htm>

³²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²⁸<http://www.openmicroscopy.org/site/support/legacy/>

³²⁹<http://biovis.com/>

³³⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/IvisionReader.java>

³³¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


³³²<http://www.openmicroscopy.org/site/support/legacy/>

17.62 JEOL

Extensions: .dat, .img, .par

Owner: [JEOL](#)³³³

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: [JEOL](#)


We currently have:

- Pascal code that reads JEOL files (from ImageSXM)
- a few JEOL files


We would like to have:


- an official specification document
- more JEOL files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [JEOLReader.java](#)³³⁴

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³³⁵ or the [previous versions](#)³³⁶ page to find documentation for the version you are using.

17.63 JPEG

Extensions: .jpg

Developer: [Independent JPEG Group](#)³³⁷

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

³³³<http://www.jeol.com>

³³⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/JEOLReader.java>

³³⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³³⁶<http://www.openmicroscopy.org/site/support/legacy/>

³³⁷<http://www.ijg.org/>


Supported Metadata Fields: *JPEG*

We currently have:

- a [JPEG specification document](#)³³⁸ (v1.04, from 1992 September 1, in PDF)
- numerous JPEG datasets
- the ability to produce more datasets


We would like to have:

Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [JPEGReader.java](#)³³⁹ Source Code: [JPEGWriter.java](#)³⁴⁰

Notes:

Bio-Formats can save individual planes as JPEG. Bio-Formats uses the [Java Image I/O](#)³⁴¹ API to read and write JPEG files. JPEG stands for “Joint Photographic Experts Group”.

See also:

[JPEG homepage](#)³⁴²


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁴³ or the [previous versions](#)³⁴⁴ page to find documentation for the version you are using.

17.64 JPEG 2000

Extensions: .jp2

Developer: [Independent JPEG Group](#)³⁴⁵

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *JPEG 2000*

Freely Available Software:

- [JJ2000 \(JPEG 2000 library for Java\)](#)³⁴⁶

We currently have:

- a JPEG 2000 specification document (free draft from 2000, no longer available online)

³³⁸<http://www.w3.org/Graphics/JPEG/jfif3.pdf>

³³⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/JPEGReader.java>

³⁴⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/JPEGWriter.java>

³⁴¹<http://docs.oracle.com/javase/6/docs/technotes/guides/imageio/>

³⁴²<http://www.jpeg.org/jpeg/index.html>

³⁴³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁴⁴<http://www.openmicroscopy.org/site/support/legacy/>

³⁴⁵<http://www.ijg.org/>

³⁴⁶<http://code.google.com/p/jj2000/>

- a few .jp2 files

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [JPEG2000Reader.java](#)³⁴⁷ Source Code: [JPEG2000Writer.java](#)³⁴⁸

Notes:

Bio-Formats uses the [JAI Image I/O Tools](#)³⁴⁹ library to read JP2 files. JPEG stands for “Joint Photographic Experts Group”.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁵⁰ or the [previous versions](#)³⁵¹ page to find documentation for the version you are using.

17.65 JPK

Extensions: .jpk

Developer: [JPK Instruments](#)³⁵²

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: [JPK](#)

We currently have:

- Pascal code that can read JPK files (from ImageSXM)
- a few JPK files

We would like to have:

- an official specification document
- more JPK files

Ratings

Pixels:

Metadata:

Openness:

Presence:

³⁴⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/JPEG2000Reader.java>


³⁴⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/JPEG2000Writer.java>

³⁴⁹<https://java.net/projects/jai-imageio>

³⁵⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵¹<http://www.openmicroscopy.org/site/support/legacy/>

³⁵²<http://www.jpk.com>

Utility: 

Additional Information

Source Code: [JPKReader.java](#)³⁵³

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁵⁴ or the [previous versions](#)³⁵⁵ page to find documentation for the version you are using.

17.66 JPX

Extensions: .jpx

Developer: [JPEG Committee](#)³⁵⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *JPX*

We currently have:

- a few .jpx files


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [JPXReader.java](#)³⁵⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁵⁸ or the [previous versions](#)³⁵⁹ page to find documentation for the version you are using.

17.67 Khoros VIFF (Visualization Image File Format) Bitmap

Extensions: .xv

Developer: [Khoral](#)³⁶⁰

³⁵³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/JPKReader.java>

³⁵⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵⁵<http://www.openmicroscopy.org/site/support/legacy/>

³⁵⁶<http://www.jpeg.org/jpeg2000/>

³⁵⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/JPXReader.java>


³⁵⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵⁹<http://www.openmicroscopy.org/site/support/legacy/>

³⁶⁰<http://www.khoral.com/company/>

Owner: [AccuSoft](#)³⁶¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Khoros VIFF (Visualization Image File Format) Bitmap*

Sample Datasets:


- [VIFF Images](#)³⁶²

We currently have:

- several VIFF datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [KhorosReader.java](#)³⁶³

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁶⁴ or the previous versions³⁶⁵ page to find documentation for the version you are using.

17.68 Kodak BIP

Extensions: .bip

Developer: [Kodak/Carestream](#)³⁶⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Kodak BIP*

We currently have:

- a few .bip datasets

We would like to have:

- an official specification document

³⁶¹<http://www.accusoft.com/company/>




³⁶²<http://netghost.narod.ru/gff/sample/images/viff/index.htm>

³⁶³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/KhorosReader.java>

³⁶⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁶⁵<http://www.openmicroscopy.org/site/support/legacy/>

³⁶⁶<http://carestream.com>

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [KodakReader.java](#)³⁶⁷


Notes:

See also:[Information on Image Station systems](#)³⁶⁸

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁶⁹ or the [previous versions](#)³⁷⁰ page to find documentation for the version you are using.

17.69 Lambert Instruments FLIM

Extensions: .fli

Developer: [Lambert Instruments](#)³⁷¹**Support**BSD-licensed: Export: 




Officially Supported Versions:

Supported Metadata Fields: *Lambert Instruments FLIM*

We currently have:

- an LI-FLIM specification document
- several example LI-FLIM datasets

We would like to have:

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [LiFlimReader.java](#)³⁷²³⁶⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/KodakReader.java>³⁶⁸<http://carestream.com/PublicContent.aspx?langType=1033&id=448953>³⁶⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>³⁷⁰<http://www.openmicroscopy.org/site/support/legacy/>³⁷¹<http://www.lambert-instruments.com>³⁷²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LiFlimReader.java>

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁷³ or the previous versions³⁷⁴ page to find documentation for the version you are using.

17.70 LaVision Inspector

Extensions: .msr

Developer: LaVision BioTec³⁷⁵

Support

BSD-licensed: ✖

Export: ✖

Officially Supported Versions:

Supported Metadata Fields: *LaVision Inspector*

We currently have:

- a few .msr files

We would like to have:

Ratings

Pixels: ▼

Metadata: ▼

Openness: ▼

Presence: ▼

Utility: ▼

Additional Information

Source Code: *InspectorReader.java*³⁷⁶

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁷⁷ or the previous versions³⁷⁸ page to find documentation for the version you are using.

17.71 Leica LCS LEI

Extensions: .lei, .tif

Developer: Leica Microsystems CMS GmbH³⁷⁹

Owner: Leica³⁸⁰

Support

³⁷³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷⁴<http://www.openmicroscopy.org/site/support/legacy/>

³⁷⁵<http://www.lavisionbiotec.com/>


³⁷⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/InspectorReader.java>

³⁷⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷⁸<http://www.openmicroscopy.org/site/support/legacy/>

³⁷⁹<http://www.leica-microsystems.com/>

³⁸⁰<http://www.leica.com/>

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Leica LCS LEI*

Freely Available Software:


- [Leica LCS Lite](#)³⁸¹

We currently have:


- an LEI specification document (beta 2.000, from no later than 2004 February 17, in PDF)
- many LEI datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [LeicaReader.java](#)³⁸²

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

LCS stands for “Leica Confocal Software”. LEI presumably stands for “Leica Experimental Information”.

Commercial applications that support LEI include:

- [Bitplane Imaris](#)³⁸³
- [SVI Huygens](#)³⁸⁴
- [Image-Pro Plus](#)³⁸⁵

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁸⁶ or the [previous versions](#)³⁸⁷ page to find documentation for the version you are using.

17.72 Leica LAS AF LIF (Leica Image File Format)

Extensions: .lif

Developer: [Leica Microsystems CMS GmbH](#)³⁸⁸

Owner: [Leica](#)³⁸⁹

Support

³⁸¹<ftp://ftp.llt.de/softlib/LCSLite/LCSLite2611537.exe>

³⁸²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LeicaReader.java>

³⁸³<http://www.bitplane.com/>

³⁸⁴<http://svi.nl/>


³⁸⁵<http://www.mediacy.com/>

³⁸⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁸⁷<http://www.openmicroscopy.org/site/support/legacy/>

³⁸⁸<http://www.leica-microsystems.com/>

³⁸⁹<http://www.leica.com/>

BSD-licensed: 

Export: 

Officially Supported Versions: 1.0, 2.0

Supported Metadata Fields: *Leica LAS AF LIF (Leica Image File Format)*

Freely Available Software:


- [Leica LAS AF Lite³⁹⁰](#) (links at bottom of page)

We currently have:


- a LIF specification document (version 2, from no later than 2007 July 26, in PDF)
- a LIF specification document (version 1, from no later than 2006 April 3, in PDF)
- numerous LIF datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [LIFReader.java³⁹¹](#)

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

LAS stands for “Leica Application Suite”. AF stands for “Advanced Fluorescence”.

Commercial applications that support LIF include:

- [Bitplane Imaris³⁹²](#)
- [SVI Huygens³⁹³](#)
- [Amira³⁹⁴](#)

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³⁹⁵](#) or the [previous versions³⁹⁶](#) page to find documentation for the version you are using.

17.73 Leica SCN

Extensions: .scn

Developer: [Leica Microsystems³⁹⁷](#)

Support

BSD-licensed: 

³⁹⁰<http://www.leica-microsystems.com/products/microscope-software/software-for-life-science-research/las-x/>

³⁹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LIFReader.java>

³⁹²<http://www.bitplane.com/>


³⁹³<http://svi.nl/>

³⁹⁴<http://www.amira.com/>

³⁹⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹⁶<http://www.openmicroscopy.org/site/support/legacy/>

³⁹⁷<http://www.leica-microsystems.com/>

Export: 

Officially Supported Versions: 2012-03-10

Supported Metadata Fields: *Leica SCN*

We currently have:

- a few sample datasets

We would like to have:

- an official specification document
- sample datasets that cannot be opened


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [LeicaSCNReader.java](#)³⁹⁸

Notes:

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)³⁹⁹ or the [previous versions](#)⁴⁰⁰ page to find documentation for the version you are using.

17.74 LEO

Extensions: .sxm

Owner: [Zeiss](#)⁴⁰¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *LEO*

We currently have:

- Pascal code that can read LEO files (from ImageSXM)
- a few LEO files

We would like to have:





- an official specification document
- more LEO files

³⁹⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LeicaSCNReader.java>

³⁹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰¹<http://www.zeiss.de>


RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [LEOReader.java](#)⁴⁰²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁰³ or the [previous versions](#)⁴⁰⁴ page to find documentation for the version you are using.

17.75 Li-Cor L2D

Extensions: .l2d, .tif, .scn

Owner: [LiCor Biosciences](#)⁴⁰⁵**Support**BSD-licensed: Export: 

Officially Supported Versions:



Supported Metadata Fields: *Li-Cor L2D*

We currently have:

- a few L2D datasets

We would like to have:

- an official specification document
- more L2D datasets

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [L2DReader.java](#)⁴⁰⁶

Notes:

⁴⁰²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LEOReader.java>

⁴⁰³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰⁵<http://www.licor.com/>

⁴⁰⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/L2DReader.java>

L2D datasets cannot be imported into OME using server-side import. They can, however, be imported from ImageJ, or using the omeul utility.


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴⁰⁷](#) or the [previous versions⁴⁰⁸](#) page to find documentation for the version you are using.

17.76 LIM (Laboratory Imaging/Nikon)

Extensions: .lim

Owner: [Laboratory Imaging⁴⁰⁹](#)

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *LIM (Laboratory Imaging/Nikon)*


We currently have:

- several LIM files
- the ability to produce more LIM files


We would like to have:

- an official specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [LIMReader.java⁴¹⁰](#)

Notes:

Bio-Formats only supports uncompressed LIM files.

Commercial applications that support LIM include:

- [NIS Elements⁴¹¹](#)

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴¹²](#) or the [previous versions⁴¹³](#) page to find documentation for the version you are using.

⁴⁰⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰⁹<http://www.lim.cz/>

⁴¹⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LIMReader.java>

⁴¹¹<http://www.nis-elements.com/>

⁴¹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁴¹³<http://www.openmicroscopy.org/site/support/legacy/>

17.77 MetaMorph 7.5 TIFF

Extensions: .tiff

Owner: [Molecular Devices](#)⁴¹⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *MetaMorph 7.5 TIFF*


We currently have:

- a few MetaMorph 7.5 TIFF datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [MetamorphTiffReader.java](#)⁴¹⁵

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴¹⁶ or the [previous versions](#)⁴¹⁷ page to find documentation for the version you are using.

17.78 MetaMorph Stack (STK)

Extensions: .stk, .nd

Owner: [Molecular Devices](#)⁴¹⁸

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *MetaMorph Stack (STK)*

We currently have:

- an STK specification document (from 2006 November 21, in DOC)
- an older STK specification document (from 2005 March 25, in DOC)

⁴¹⁴<http://www.moleculardevices.com/>

⁴¹⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MetamorphTiffReader.java>

⁴¹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁴¹⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴¹⁸<http://www.moleculardevices.com/>


- an ND specification document (from 2002 January 24, in PDF)
- a large number of datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [MetamorphReader.java](#)⁴¹⁹

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

Commercial applications that support STK include:

- [Bitplane Imaris](#)⁴²⁰
- [SVI Huygens](#)⁴²¹
- [DIMIN](#)⁴²²

See also:

[Metamorph imaging system overview](#)⁴²³


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴²⁴ or the [previous versions](#)⁴²⁵ page to find documentation for the version you are using.

17.79 MIAS (Maia Scientific)

Extensions: .tif

Developer: [Maia Scientific](#)⁴²⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *MIAS (Maia Scientific)*

We currently have:

- several MIAS datasets

⁴¹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MetamorphReader.java>

⁴²⁰<http://www.bitplane.com/>

⁴²¹<http://svi.nl/>

⁴²²<http://dimin.net/>

⁴²³<http://www.metamorph.com/>

⁴²⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴²⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁴²⁶<http://www.selectscience.net/supplier/maia-scientific/?compID=6088>

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [MIASReader.java](#)⁴²⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴²⁸ or the [previous versions](#)⁴²⁹ page to find documentation for the version you are using.

17.80 Micro-Manager

Extensions: .tif, .txt, .xml

Developer: [Vale Lab](#)⁴³⁰

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: *Micro-Manager*

Freely Available Software:

- [Micro-Manager](#)⁴³¹

We currently have:

- many Micro-manager datasets

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [MicromanagerReader.java](#)⁴³²

⁴²⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MIASReader.java>

⁴²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴²⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁴³⁰<http://valelab.ucsf.edu/>

⁴³¹<http://micro-manager.org/>

⁴³²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/MicromanagerReader.java>

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴³³](#) or the [previous versions⁴³⁴](#) page to find documentation for the version you are using.

17.81 MINC MRI

Extensions: .mnc

Developer: [McGill University⁴³⁵](#)

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *MINC MRI*

Freely Available Software:


- [MINC⁴³⁶](#)

We currently have:

- a few MINC files

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [MINCReader.java⁴³⁷](#)

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴³⁸](#) or the [previous versions⁴³⁹](#) page to find documentation for the version you are using.

17.82 Minolta MRW

Extensions: .mrw

Developer: [Minolta⁴⁴⁰](#)

Support

⁴³³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁴³⁵<http://www.bic.mni.mcgill.ca/ServicesSoftware/MINC>


⁴³⁶<http://www.bic.mni.mcgill.ca/ServicesSoftware/MINC>

⁴³⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MINCReader.java>

⁴³⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁴⁰<http://www.konicaminolta.com/>

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Minolta MRW*

Freely Available Software:


- [dcraw](#)⁴⁴¹

We currently have:


- several .mrw files


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [MRWReader.java](#)⁴⁴²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁴³ or the [previous versions](#)⁴⁴⁴ page to find documentation for the version you are using.

17.83 MNG (Multiple-image Network Graphics)

Extensions: .mng

Developer: [MNG Development Group](#)⁴⁴⁵

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *MNG (Multiple-image Network Graphics)*

Freely Available Software:

- [libmng \(MNG reference library\)](#)⁴⁴⁶

Sample Datasets:

- [MNG sample files](#)⁴⁴⁷

We currently have:

⁴⁴¹<http://www.cybercom.net/%7Edcoffin/dcraw/>

⁴⁴²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MRWReader.java>

⁴⁴³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁴⁵<http://www.libpng.org/pub/mng/mngnews.html>


⁴⁴⁶<http://sourceforge.net/projects/libmng/>

⁴⁴⁷<http://sourceforge.net/projects/libmng/files/libmng-testsuites/MNGsuite-1.0/MNGsuite.zip/download>

- the `libmng-testsuites`⁴⁴⁸ package (from 2003 March 05, in C)
- a large number of MNG datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: `MNGReader.java`⁴⁴⁹

Notes:

See also:

[MNG homepage](#)⁴⁵⁰ [MNG specification](#)⁴⁵¹

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁵² or the [previous versions](#)⁴⁵³ page to find documentation for the version you are using.

17.84 Molecular Imaging

Extensions: `.stp`

Owner: Molecular Imaging Corp, San Diego CA (closed)

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Molecular Imaging*

We currently have:

- Pascal code that reads Molecular Imaging files (from ImageSXM)
- a few Molecular Imaging files

We would like to have:

- an official specification document
- more Molecular Imaging files

Ratings

Pixels: 

Metadata: 

Openness: 

⁴⁴⁸<http://downloads.sourceforge.net/libmng/MNGsuite-20030305.zip>


⁴⁴⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/MNGReader.java>


⁴⁵⁰<http://www.libpng.org/pub/mng/>

⁴⁵¹<http://www.libpng.org/pub/mng/spec>

⁴⁵²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁵³<http://www.openmicroscopy.org/site/support/legacy/>

Presence: 

Utility: 

Additional Information

Source Code: [MolecularImagingReader.java](#)⁴⁵⁴

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁵⁵ or the [previous versions](#)⁴⁵⁶ page to find documentation for the version you are using.

17.85 MRC (Medical Research Council)

Extensions: .mrc

Developer: [MRC Laboratory of Molecular Biology](#)⁴⁵⁷

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *MRC (Medical Research Council)*

Sample Datasets:

- [golgi.mrc](#)⁴⁵⁸

We currently have:

- an [MRC specification document](#)⁴⁵⁹ (in TXT)
- a few MRC datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [MRCReader.java](#)⁴⁶⁰

Notes:

Commercial applications that support MRC include:

- [Bitplane Imaris](#)⁴⁶¹

⁴⁵⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MolecularImagingReader.java>

⁴⁵⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁵⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁵⁷<http://www2.mrc-lmb.cam.ac.uk/>

⁴⁵⁸http://bio3d.colorado.edu/imod/files/imod_data.tar.gz

⁴⁵⁹http://bio3d.colorado.edu/imod/doc/mrc_format.txt

⁴⁶⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MRCReader.java>


⁴⁶¹<http://www.bitplane.com/>

See also:[MRC on Wikipedia](#)⁴⁶²

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁶³ or the [previous versions](#)⁴⁶⁴ page to find documentation for the version you are using.

17.86 NEF (Nikon Electronic Format)

Extensions: .nef, .tif

Developer: [Nikon](#)⁴⁶⁵**Support**BSD-licensed: Export: 

Officially Supported Versions:

Supported Metadata Fields: *NEF (Nikon Electronic Format)*




Sample Datasets:

- [neffile1.zip](#)⁴⁶⁶
- [Sample NEF images](#)⁴⁶⁷

We currently have:

- a NEF specification document (v0.1, from 2003, in PDF)
- several NEF datasets

We would like to have:

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [NikonReader.java](#)⁴⁶⁸

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.**See also:**[NEF Conversion](#)⁴⁶⁹

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁷⁰ or the [previous](#)⁴⁶²http://en.wikipedia.org/wiki/MRC_%28file_format%29⁴⁶³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁴⁶⁴<http://www.openmicroscopy.org/site/support/legacy/>⁴⁶⁵<http://www.nikon.com/>⁴⁶⁶http://www.outbackphoto.com/workshop/NEF_conversion/neffile1.zip⁴⁶⁷http://www.nikondigital.org/articles/library/nikon_d2x_first_impressions.htm⁴⁶⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NikonReader.java>⁴⁶⁹http://www.outbackphoto.com/workshop/NEF_conversion/nefconversion.html


[versions](#)⁴⁷¹ page to find documentation for the version you are using.

17.87 NIfTI

Extensions: .img, .hdr

Developer: [National Institutes of Health](#)⁴⁷²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *NIfTI*

Sample Datasets:


- [Official test data](#)⁴⁷³

We currently have:


- [NIfTI specification documents](#)⁴⁷⁴
- several NIfTI datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [NiftiReader.java](#)⁴⁷⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁷⁶ or the [previous versions](#)⁴⁷⁷ page to find documentation for the version you are using.

17.88 Nikon Elements TIFF

Extensions: .tiff

Developer: [Nikon](#)⁴⁷⁸

Support

⁴⁷⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷¹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁷²<http://www.nih.gov/>

⁴⁷³<http://nifti.nimh.nih.gov/nifti-1/data>

⁴⁷⁴<http://nifti.nimh.nih.gov/nifti-1/>

⁴⁷⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NiftiReader.java>

⁴⁷⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁷⁸<http://www.nikon.com>

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Nikon Elements TIFF*


We currently have:

- a few Nikon Elements TIFF files


We would like to have:


- more Nikon Elements TIFF files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [NikonElementsTiffReader.java](#)⁴⁷⁹

Notes:

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)⁴⁸⁰ or the [previous versions](#)⁴⁸¹ page to find documentation for the version you are using.

17.89 Nikon EZ-C1 TIFF

Extensions: .tiff

Developer: [Nikon](#)⁴⁸²

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:


Supported Metadata Fields: *Nikon EZ-C1 TIFF*

We currently have:

- a few Nikon EZ-C1 TIFF files

We would like to have:

Ratings

Pixels: 

Metadata: 


Openness: 


⁴⁷⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NikonElementsTiffReader.java>

⁴⁸⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁸¹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁸²<http://www.nikon.com/>

Presence: 

Utility: 

Additional Information

Source Code: [NikonTiffReader.java](#)⁴⁸³

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁸⁴ or the [previous versions](#)⁴⁸⁵ page to find documentation for the version you are using.

17.90 Nikon NIS-Elements ND2

Extensions: .nd2

Developer: [Nikon USA](#)⁴⁸⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Nikon NIS-Elements ND2*

Freely Available Software:

- [NIS-Elements Viewer from Nikon](#)⁴⁸⁷


We currently have:

- many ND2 datasets

We would like to have:

- an official specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [NativeND2Reader.java](#)⁴⁸⁸

Notes:

There are two distinct versions of ND2: an old version, which uses JPEG-2000 compression, and a new version which is either uncompressed or Zip-compressed. We are not aware of the version number or release date for either format.

Bio-Formats uses the [JAI Image I/O Tools](#)⁴⁸⁹ library to read ND2 files compressed with JPEG-2000.

⁴⁸³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NikonTiffReader.java>

⁴⁸⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁸⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁸⁶<http://www.nikonusa.com/>

⁴⁸⁷<http://www.nikoninstruments.com/Products/Software/NIS-Elements-Advanced-Research/NIS-Elements-Viewer>

⁴⁸⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NativeND2Reader.java>

⁴⁸⁹<http://java.net/projects/jai-imageio>

There is also an ND2 reader that uses Nikon's native libraries. To use it, you must be using Windows and have [Nikon's ND2 reader plugin for ImageJ](#)⁴⁹⁰ installed. Additionally, you will need to download [LegacyND2Reader.dll](#)⁴⁹¹ and place it in your ImageJ plugin folder.


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁹² or the [previous versions](#)⁴⁹³ page to find documentation for the version you are using.

17.91 NRRD (Nearly Raw Raster Data)

Extensions: .nrrd, .nhdr, .raw, .txt

Developer: [Teem developers](#)⁴⁹⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *NRRD (Nearly Raw Raster Data)*

Freely Available Software:

- [nrrd \(NRRD reference library\)](#)⁴⁹⁵

Sample Datasets:


- [Diffusion tensor MRI datasets](#)⁴⁹⁶

We currently have:

- an [nrrd specification document](#)⁴⁹⁷ (v1.9, from 2005 December 24, in HTML)
- a few nrrd datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [NRRDReader.java](#)⁴⁹⁸

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁹⁹ or the [previous versions](#)⁵⁰⁰ page to find documentation for the version you are using.

⁴⁹⁰<http://rsb.info.nih.gov/ij/plugins/nd2-reader.html>

⁴⁹¹<https://github.com/openmicroscopy/bioformats/blob/develop/lib/LegacyND2Reader.dll?raw=true>

⁴⁹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁹³<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁹⁴<http://teem.sourceforge.net/>

⁴⁹⁵<http://teem.sourceforge.net/nrrd/>

⁴⁹⁶<http://www.sci.utah.edu/%7Egk/DTI-data/>

⁴⁹⁷<http://teem.sourceforge.net/nrrd/format.html>

⁴⁹⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/NRRDReader.java>

⁴⁹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁵⁰⁰<http://www.openmicroscopy.org/site/support/legacy/>

17.92 Olympus CellR/APL

Extensions: .apl, .mtb, .tnb, .tif, .obsep

Owner: [Olympus](#)⁵⁰¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Olympus CellR/APL*


We currently have:

- a few CellR datasets

We would like to have:


- more CellR datasets
- an official specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [APLReader.java](#)⁵⁰²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁰³ or the [previous versions](#)⁵⁰⁴ page to find documentation for the version you are using.

17.93 Olympus FluoView FV1000

Extensions: .oib, .oif

Owner: [Olympus](#)⁵⁰⁵

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 1.0, 2.0

Supported Metadata Fields: *Olympus FluoView FV1000*

⁵⁰¹<http://www.olympus.com/>

⁵⁰²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/APLReader.java>

⁵⁰³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁰⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁰⁵<http://www.olympus.com/>

Freely Available Software:

- [FV-Viewer from Olympus](#)⁵⁰⁶


We currently have:

- an OIF specification document (v2.0.0.0, from 2008, in PDF)
- an FV1000 specification document (v1.0.0.0, from 2004 June 22, in PDF)
- older FV1000 specification documents (draft, in DOC and XLS)
- many FV1000 datasets

We would like to have:


- more OIB datasets (especially 2+ GB files)
- more FV1000 version 2 datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [FV1000Reader.java](#)⁵⁰⁷

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

Bio-Formats uses a modified version of the [Apache Jakarta POI](#)⁵⁰⁸ library to read OIB files. OIF stands for “Original Imaging Format”. OIB stands for “Olympus Image Binary”. OIF is a multi-file format that includes an .oif file and a directory of .tif, .roi, .pty, .lut, and .bmp files. OIB is a single file format.

Commercial applications that support this format include:

- [Bitplane Imaris](#)⁵⁰⁹
- [SVI Huygens](#)⁵¹⁰

See also:

[Olympus FluoView Resource Center](#)⁵¹¹

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵¹² or the [previous versions](#)⁵¹³ page to find documentation for the version you are using.

17.94 Olympus FluoView TIFF

Extensions: .tif

Owner: [Olympus](#)⁵¹⁴

⁵⁰⁶http://www.olympus.co.uk/microscopy/22_FluoView_FV1000__Confocal_Microscope.htm

⁵⁰⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FV1000Reader.java>

⁵⁰⁸<http://jakarta.apache.org/poi/>

⁵⁰⁹<http://www.bitplane.com/>

⁵¹⁰<http://svi.nl/>


⁵¹¹<http://www.olympusfluoview.com>

⁵¹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵¹³<http://www.openmicroscopy.org/site/support/legacy/>

⁵¹⁴<http://www.olympus.com/>

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Olympus FluoView TIFF*

Freely Available Software:


- [DIMIN](#)⁵¹⁵

We currently have:


- a FluoView specification document (from 2002 November 14, in DOC)
- Olympus' FluoView Image File Reference Suite (from 2002 March 1, in DOC)
- several FluoView datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [FluoviewReader.java](#)⁵¹⁶

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

Commercial applications that support this format include:

- [Bitplane Imaris](#)⁵¹⁷
- [SVI Huygens](#)⁵¹⁸

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵¹⁹ or the [previous versions](#)⁵²⁰ page to find documentation for the version you are using.


17.95 Olympus ScanR

Extensions: .xml, .dat, .tif

Developer: [Olympus](#)⁵²¹

Owner: [Olympus](#)⁵²²

Support

BSD-licensed: 

⁵¹⁵<http://www.dimin.net/>

⁵¹⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FluoviewReader.java>

⁵¹⁷<http://www.bitplane.com/>

⁵¹⁸<http://svi.nl/>

⁵¹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵²⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁵²¹<http://www.olympus.com/>

⁵²²<http://www.olympus.com/>

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Olympus ScanR*

We currently have:

- several ScanR datasets

We would like to have:

Ratings

Pixels: 🟢

Metadata: 🟡

Openness: 🟡

Presence: 🔴

Utility: 🟠

Additional Information

Source Code: [ScanrReader.java](#)⁵²³

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵²⁴ or the [previous versions](#)⁵²⁵ page to find documentation for the version you are using.

17.96 Olympus SIS TIFF

Extensions: .tiff

Developer: [Olympus](#)⁵²⁶

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Olympus SIS TIFF*

We currently have:

- a few example SIS TIFF files

We would like to have:

Ratings

Pixels: 🟡

Metadata: 🟡

Openness: 🟡

Presence: 🟠

Utility: 🟡

⁵²³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ScanrReader.java>

⁵²⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵²⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁵²⁶<http://www.olympus-sis.com/>

Additional Information

Source Code: [SISReader.java](#)⁵²⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵²⁸ or the [previous versions](#)⁵²⁹ page to find documentation for the version you are using.

17.97 OME-TIFF

Extensions: [.ome.tiff](#)⁵³⁰

Developer: [Open Microscopy Environment](#)⁵³¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 2003FC, 2007-06, 2008-02, 2008-09, 2009-09, 2010-04, 2010-06, 2011-06, 2012-06, 2013-06


Supported Metadata Fields: [OME-TIFF](#)

We currently have:

- an [OME-TIFF specification document](#)⁵³² (from 2006 October 19, in HTML)
- many OME-TIFF datasets
- the ability to produce additional datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [OMETiffReader.java](#)⁵³³ Source Code: [OMETiffWriter.java](#)⁵³⁴

Notes:

Bio-Formats can save image stacks as OME-TIFF.

Commercial applications that support OME-TIFF include:

- [Bitplane Imaris](#)⁵³⁵
- [SVI Huygens](#)⁵³⁶

⁵²⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SISReader.java>

⁵²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵²⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁵³⁰<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff/index.html>

⁵³¹<http://www.openmicroscopy.org/>

⁵³²<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff/specification.html>

⁵³³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/OMETiffReader.java>

⁵³⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/OMETiffWriter.java>

⁵³⁵<http://www.bitplane.com/>

⁵³⁶<http://svi.nl/>

See also:

OME-TIFF technical overview⁵³⁷


Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁵³⁸ or the previous versions⁵³⁹ page to find documentation for the version you are using.

17.98 OME-XML

Extensions: .ome⁵⁴⁰

Developer: Open Microscopy Environment⁵⁴¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 2003FC, 2007-06, 2008-02, 2008-09, 2009-09, 2010-04, 2010-06, 2011-06, 2012-06, 2013-06


Supported Metadata Fields: *OME-XML*

We currently have:

- OME-XML specification documents⁵⁴²
- many OME-XML datasets
- the ability to produce more datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: OMEXMLReader.java⁵⁴³ Source Code: OMEXMLWriter.java⁵⁴⁴

Notes:

Bio-Formats uses the OME-XML Java library⁵⁴⁵ to read OME-XML files.

Commercial applications that support OME-XML include:

- Bitplane Imaris⁵⁴⁶
- SVI Huygens⁵⁴⁷

⁵³⁷<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff/index.html>

⁵³⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵³⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁴⁰<http://www.openmicroscopy.org/site/support/ome-model/ome-xml/index.html>

⁵⁴¹<http://www.openmicroscopy.org/>

⁵⁴²<http://www.openmicroscopy.org/Schemas/>

⁵⁴³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/OMEXMLReader.java>

⁵⁴⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/OMEXMLWriter.java>

⁵⁴⁵<http://www.openmicroscopy.org/site/support/ome-model/ome-xml/java-library.html>

⁵⁴⁶<http://www.bitplane.com/>

⁵⁴⁷<http://svi.nl/>


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁵⁴⁸](#) or the [previous versions⁵⁴⁹](#) page to find documentation for the version you are using.

17.99 Oxford Instruments

Extensions: .top

Owner: [Oxford Instruments⁵⁵⁰](#)

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Oxford Instruments*


We currently have:


- Pascal code that can read Oxford Instruments files (from ImageSXM)
- a few Oxford Instruments files


We would like to have:


- an official specification document
- more Oxford Instruments files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [OxfordInstrumentsReader.java⁵⁵¹](#)

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁵⁵²](#) or the [previous versions⁵⁵³](#) page to find documentation for the version you are using.

17.100 PCORAW

Extensions: .pcoraw, .rec

Developer: [PCO⁵⁵⁴](#)

Support

⁵⁴⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁴⁹<http://www.openmicroscopy.org/site/support/legacy/>


⁵⁵⁰<http://www.oxinst.com>

⁵⁵¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/OxfordInstrumentsReader.java>

⁵⁵²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁵³<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁵⁴<http://www.pco.de/>

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *PCORAW*

We currently have:

- a few example datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [PCORAWReader.java](#)⁵⁵⁵

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁵⁶ or the [previous versions](#)⁵⁵⁷ page to find documentation for the version you are using.

17.101 PCX (PC Paintbrush)

Extensions: .pcx

Developer: ZSoft Corporation

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *PCX (PC Paintbrush)*

We currently have:

- several .pcx files
- the ability to generate additional .pcx files

We would like to have:

Ratings

Pixels: 

Metadata: 


Openness: 

Presence: 

⁵⁵⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PCORAWReader.java>

⁵⁵⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁵⁷<http://www.openmicroscopy.org/site/support/legacy/>

Utility: 

Additional Information

Source Code: [PCXReader.java](#)⁵⁵⁸

Notes:

Commercial applications that support PCX include [Zeiss LSM Image Browser](#)⁵⁵⁹.


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁶⁰ or the [previous versions](#)⁵⁶¹ page to find documentation for the version you are using.

17.102 Perkin Elmer Densitometer

Extensions: .pds

Developer: [Perkin Elmer](#)⁵⁶²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Perkin Elmer Densitometer*


We currently have:

- a few PDS datasets

We would like to have:

- an official specification document
- more PDS datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [PDSReader.java](#)⁵⁶³

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁶⁴ or the [previous versions](#)⁵⁶⁵ page to find documentation for the version you are using.

⁵⁵⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/PCXReader.java>

⁵⁵⁹http://www.zeiss.com/microscopy/en_de/downloads/lsm-5-series.html

⁵⁶⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁶¹<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁶²<http://www.perkinelmer.com>

⁵⁶³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PDSReader.java>

⁵⁶⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁵⁶⁵<http://www.openmicroscopy.org/site/support/legacy/>

17.103 PerkinElmer Nuance

Extensions: .im3

Developer: [PerkinElmer](#)⁵⁶⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *PerkinElmer Nuance*

We currently have:

- a few sample datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [IM3Reader.java](#)⁵⁶⁷

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁶⁸ or the [previous versions](#)⁵⁶⁹ page to find documentation for the version you are using.

17.104 PerkinElmer Operetta

Extensions: .tiff, .xml

Developer: [PerkinElmer](#)⁵⁷⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *PerkinElmer Operetta*

We currently have:

- a few sample datasets

We would like to have:

⁵⁶⁶<http://www.perkinelmer.com/>

⁵⁶⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/IM3Reader.java>


⁵⁶⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁵⁶⁹<http://www.openmicroscopy.org/site/support/legacy/>


⁵⁷⁰<http://www.perkinelmer.com/>


- an official specification document
- more sample datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [OperettaReader.java](#)⁵⁷¹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁷² or the [previous versions](#)⁵⁷³ page to find documentation for the version you are using.

17.105 PerkinElmer UltraView

Extensions: .tif, .2, .3, .4, etc.

Owner: [PerkinElmer](#)⁵⁷⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *PerkinElmer UltraView*

We currently have:

- several UltraView datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [PerkinElmerReader.java](#)⁵⁷⁵

Notes:

Other associated extensions include: .tim, .zpo, .csv, .htm, .cfg, .ano, .rec

⁵⁷¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/OperettaReader.java>

⁵⁷²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁷³<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁷⁴<http://www.perkinelmer.com/>

⁵⁷⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PerkinElmerReader.java>

Commercial applications that support this format include:

- Bitplane Imaris⁵⁷⁶
- Image-Pro Plus⁵⁷⁷

See also:

PerkinElmer UltraView system overview⁵⁷⁸


Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁵⁷⁹ or the previous versions⁵⁸⁰ page to find documentation for the version you are using.

17.106 PGM (Portable Gray Map)

Extensions: .pgm

Developer: Netpbm developers

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *PGM (Portable Gray Map)*

Freely Available Software:


- Netpbm graphics filter⁵⁸¹

We currently have:

- a PGM specification document⁵⁸² (from 2003 October 3, in HTML)
- a few PGM files


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: *PGMReader.java*⁵⁸³

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁵⁸⁴ or the previous versions⁵⁸⁵ page to find documentation for the version you are using.

⁵⁷⁶<http://www.bitplane.com/>

⁵⁷⁷<http://www.mediacy.com/>

⁵⁷⁸<http://www.perkinelmer.com/pages/020/cellularimaging/products/ultraviewvoxsystemsoverview.xhtml>

⁵⁷⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁸⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁸¹<http://netpbm.sourceforge.net/>

⁵⁸²<http://netpbm.sourceforge.net/doc/pgm.html>

⁵⁸³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/PGMReader.java>

⁵⁸⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁸⁵<http://www.openmicroscopy.org/site/support/legacy/>

17.107 Adobe Photoshop PSD

Extensions: .psd

Developer: [Adobe](#)⁵⁸⁶

Support

BSD-licensed: ✖

Export: ✖

Officially Supported Versions: 1.0

Supported Metadata Fields: *Adobe Photoshop PSD*

We currently have:

- a PSD specification document (v3.0.4, 16 July 1995)
- a few PSD files

We would like to have:

- more PSD files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [PSDReader.java](#)⁵⁸⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁸⁸ or the [previous versions](#)⁵⁸⁹ page to find documentation for the version you are using.

17.108 Photoshop TIFF

Extensions: .tif, .tiff

Developer: [Adobe](#)⁵⁹⁰

Support

BSD-licensed: ✖

Export: ✖

Officially Supported Versions:

Supported Metadata Fields: *Photoshop TIFF*

⁵⁸⁶<http://www.adobe.com/>

⁵⁸⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PSDReader.java>

⁵⁸⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁸⁹<http://www.openmicroscopy.org/site/support/legacy/>


⁵⁹⁰<http://www.adobe.com>


We currently have:


- a Photoshop TIFF specification document
- a few Photoshop TIFF files


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [PhotoshopTiffReader.java](#)⁵⁹¹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁹² or the [previous versions](#)⁵⁹³ page to find documentation for the version you are using.

17.109 PicoQuant Bin

Extensions: .bin

Developer: [PicoQuant](#)⁵⁹⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *PicoQuant Bin*

Freely Available Software:


- [SymphoTime64](#)⁵⁹⁵

We currently have:

- a few example datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

⁵⁹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PhotoshopTiffReader.java>

⁵⁹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁹³<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁹⁴<http://www.picoquant.com/>

⁵⁹⁵<http://www.picoquant.com/products/category/software/symphotime-64-fluorescence-lifetime-imaging-and-correlation-software>

Additional Information

Source Code: [PQBinReader.java](#)⁵⁹⁶

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁹⁷ or the [previous versions](#)⁵⁹⁸ page to find documentation for the version you are using.

17.110 PICT (Macintosh Picture)

Extensions: .pict

Developer: [Apple Computer](#)⁵⁹⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *PICT (Macintosh Picture)*

We currently have:

- many PICT datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [PictReader.java](#)⁶⁰⁰

Notes:

[QuickTime for Java](#)⁶⁰¹ is required for reading vector files and some compressed files.

See also:

[PICT technical overview](#)⁶⁰² [Another PICT technical overview](#)⁶⁰³

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁰⁴ or the [previous versions](#)⁶⁰⁵ page to find documentation for the version you are using.

⁵⁹⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PQBinReader.java>

⁵⁹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁹⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁹⁹<http://www.apple.com>

⁶⁰⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/PictReader.java>

⁶⁰¹<http://www.apple.com/quicktime/download/standalone.html>

⁶⁰²<http://www.faqs.org/faqs/graphics/fileformats-faq/part3/section-107.html>

⁶⁰³<http://www.prepressure.com/formats/pict/fileformat.htm>

⁶⁰⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁶⁰⁵<http://www.openmicroscopy.org/site/support/legacy/>

17.111 PNG (Portable Network Graphics)

Extensions: .png

Developer: [PNG Development Group](#)⁶⁰⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *PNG (Portable Network Graphics)*

Freely Available Software:


- [PNG Writer plugin for ImageJ](#)⁶⁰⁷

We currently have:

- a [PNG specification document](#)⁶⁰⁸ (W3C/ISO/IEC version, from 2003 November 10, in HTML)
- several PNG datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [APNGReader.java](#)⁶⁰⁹

Notes:

Bio-Formats uses the [Java Image I/O](#)⁶¹⁰ API to read and write PNG files.

See also:

[PNG technical overview](#)⁶¹¹

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶¹² or the [previous versions](#)⁶¹³ page to find documentation for the version you are using.

17.112 Prairie Technologies TIFF

Extensions: .tif, .xml, .cfg

Developer: [Prairie Technologies](#)⁶¹⁴

⁶⁰⁶<http://www.libpng.org/pub/png/pngnews.html>

⁶⁰⁷<http://rsb.info.nih.gov/ij/plugins/png-writer.html>

⁶⁰⁸<http://www.libpng.org/pub/png/spec/iso/>

⁶⁰⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/APNGReader.java>

⁶¹⁰<http://docs.oracle.com/javase/6/docs/technotes/guides/imageio/>

⁶¹¹<http://www.libpng.org/pub/png/>

⁶¹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶¹³<http://www.openmicroscopy.org/site/support/legacy/>

⁶¹⁴<http://www.prairie-technologies.com/>

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Prairie Technologies TIFF*

We currently have:

- many Prairie datasets

We would like to have:

Ratings

Pixels: 🟢

Metadata: 🟡

Openness: 🟡

Presence: 🟠

Utility: 🟡

Additional Information

Source Code: [PrairieReader.java](#)⁶¹⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁶¹⁶ or the previous versions⁶¹⁷ page to find documentation for the version you are using.

17.113 Quesant

Extensions: .afm

Developer: Quesant Instrument Corporation

Owner: [KLA-Tencor Corporation](#)⁶¹⁸

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Quesant*

We currently have:

- Pascal code that can read Quesant files (from ImageSXM)
- several Quesant files

We would like to have:





- an official specification document
- more Quesant files

⁶¹⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PrairieReader.java>

⁶¹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶¹⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁶¹⁸<http://www.kla-tencor.com/surface-profilometry-and-metrology.html>


RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [QuesantReader.java](#)⁶¹⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶²⁰ or the [previous versions](#)⁶²¹ page to find documentation for the version you are using.

17.114 QuickTime Movie

Extensions: .mov

Owner: [Apple Computer](#)⁶²²**Support**BSD-licensed: Export: 

Officially Supported Versions:

Supported Metadata Fields: [QuickTime Movie](#)

Freely Available Software:


- [QuickTime Player](#)⁶²³


We currently have:


- a [QuickTime specification document](#)⁶²⁴ (from 2001 March 1, in HTML)
- several QuickTime datasets
- the ability to produce more datasets

We would like to have:

- more QuickTime datasets, including:
 - files compressed with a common, unsupported codec
 - files with audio tracks and/or multiple video tracks

RatingsPixels: Metadata: Openness: ⁶¹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/QuesantReader.java>⁶²⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁶²¹<http://www.openmicroscopy.org/site/support/legacy/>⁶²²<http://www.apple.com/>⁶²³<http://www.apple.com/quicktime/download/>⁶²⁴<http://developer.apple.com/documentation/Quicktime/QTFF/>

Presence: 

Utility: 

Additional Information

Source Code: [NativeQTReader.java](#)⁶²⁵ Source Code: [QTWriter.java](#)⁶²⁶

Notes:

Bio-Formats has two modes of operation for QuickTime:

- QTJava mode requires [QuickTime](#)⁶²⁷ to be installed (32-bit JVM only, not supported with 64-bit).
- Native mode works on systems with no QuickTime (e.g. Linux).

Bio-Formats can save image stacks as QuickTime movies. The following table shows supported codecs:

Codec	Description	Native	QTJava
raw	Full Frames (Uncompressed)	read & write	read & write
iraw	Intel YUV Uncompressed	read only	read & write
rle	Animation (run length encoded RGB)	read only	read & write
jpeg	Still Image JPEG DIB	read only	read only
rpza	Apple Video 16 bit “road pizza”	read only (partial)	read only
mjpb	Motion JPEG codec	read only	read only
cvid	Cinepak	•	read & write
svq1	Sorenson Video	•	read & write
svq3	Sorenson Video 3	•	read & write
mp4v	MPEG-4	•	read & write
h263	H.263	•	read & write

See also:

[QuickTime software overview](#)⁶²⁸

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶²⁹ or the [previous versions](#)⁶³⁰ page to find documentation for the version you are using.

17.115 RHK

Extensions: .sm2, .sm3

Owner: [RHK Technologies](#)⁶³¹

Support

BSD-licensed: 

Export: 

⁶²⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/NativeQTReader.java>

⁶²⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/QTWriter.java>

⁶²⁷<http://www.apple.com/quicktime/download/>

⁶²⁸<http://www.apple.com/quicktime/>

⁶²⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶³⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁶³¹<http://www.rhk-tech.com>

Officially Supported Versions:

Supported Metadata Fields: *RHK*


We currently have:

- Pascal code that can read RHK files (from ImageSXM)
- a few RHK files


We would like to have:


- an official specification document
- more RHK files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [RHKReader.java](#)⁶³²


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶³³ or the [previous versions](#)⁶³⁴ page to find documentation for the version you are using.

17.116 SBIG

Owner: [Santa Barbara Instrument Group \(SBIG\)](#)⁶³⁵

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *SBIG*


We currently have:

- an [official SBIG specification document](#)⁶³⁶
- a few SBIG files

We would like to have:

- more SBIG files

Ratings

Pixels: 

Metadata: 




⁶³²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/RHKReader.java>

⁶³³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶³⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁶³⁵<http://www.sbig.com>

⁶³⁶<http://sbig.impulse.net/pdffiles/file.format.pdf>


Openness: Presence: Utility: **Additional Information**Source Code: [SBIGReader.java](#)⁶³⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶³⁸ or the [previous versions](#)⁶³⁹ page to find documentation for the version you are using.

17.117 Seiko

Extensions: .xqd, .xqf

Owner: [Seiko](#)⁶⁴⁰**Support**BSD-licensed: Export: 

Officially Supported Versions:





Supported Metadata Fields: *Seiko*

We currently have:

- Pascal code that can read Seiko files (from ImageSXM)
- a few Seiko files

We would like to have:

- an official specification document
- more Seiko files

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [SeikoReader.java](#)⁶⁴¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁴² or the [previous versions](#)⁶⁴³ page to find documentation for the version you are using.

⁶³⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SBIGReader.java>⁶³⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁶³⁹<http://www.openmicroscopy.org/site/support/legacy/>⁶⁴⁰<http://www.seiko.co.jp/en/index.php>⁶⁴¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SeikoReader.java>⁶⁴²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁶⁴³<http://www.openmicroscopy.org/site/support/legacy/>

17.118 SimplePCI & HCImage

Extensions: .cxd

Developer: [Compix](#)⁶⁴⁴

Support

BSD-licensed: ✖

Export: ✖

Officially Supported Versions:

Supported Metadata Fields: *SimplePCI & HCImage*

We currently have:

- several SimplePCI files

We would like to have:

Ratings

Pixels: 🟢

Metadata: 🟡

Openness: 🟢

Presence: 🔴

Utility: 🟠

Additional Information

Source Code: [PCIReader.java](#)⁶⁴⁵

Notes:

Bio-Formats uses a modified version of the [Apache Jakarta POI library](#)⁶⁴⁶ to read CXD files.

See also:

[SimplePCI software overview](#)⁶⁴⁷

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁴⁸ or the [previous versions](#)⁶⁴⁹ page to find documentation for the version you are using.

17.119 SimplePCI & HCImage TIFF

Extensions: .tiff

Developer: [Hamamatsu](#)⁶⁵⁰

Support

BSD-licensed: ✖

Export: ✖

Officially Supported Versions:

⁶⁴⁴<http://hcimage.com>

⁶⁴⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PCIReader.java>

⁶⁴⁶<http://jakarta.apache.org/poi/>

⁶⁴⁷<http://hcimage.com/simple-pci-legacy/>

⁶⁴⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁴⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁵⁰<http://hcimage.com/simple-pci-legacy/>

Supported Metadata Fields: *SimplePCI & HCImage TIFF*

We currently have:

- a few SimplePCI TIFF datasets

We would like to have:

- more SimplePCI TIFF datasets

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [SimplePCITiffReader.java](#)⁶⁵¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁵² or the [previous versions](#)⁶⁵³ page to find documentation for the version you are using.

17.120 SM Camera

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: *SM Camera*

We currently have:

- Pascal code that can read SM-Camera files (from ImageSXM)
- a few SM-Camera files

We would like to have:

- an official specification document
- more SM-Camera files

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

⁶⁵¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SimplePCITiffReader.java>

⁶⁵²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁵³<http://www.openmicroscopy.org/site/support/legacy/>

Source Code: [SMCameraReader.java](#)⁶⁵⁴

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁵⁵ or the [previous versions](#)⁶⁵⁶ page to find documentation for the version you are using.

17.121 SPIDER

Extensions: .spi, .stk

Developer: [Wadsworth Center](#)⁶⁵⁷

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *SPIDER*

Freely Available Software:


- [SPIDER](#)⁶⁵⁸

We currently have:

- a few example datasets
- [official file format documentation](#)⁶⁵⁹


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [SpiderReader.java](#)⁶⁶⁰

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁶¹ or the [previous versions](#)⁶⁶² page to find documentation for the version you are using.

⁶⁵⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SMCameraReader.java>

⁶⁵⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁵⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁵⁷http://www.wadsworth.org/spider_doc/spider/docs/spider.html

⁶⁵⁸http://www.wadsworth.org/spider_doc/spider/docs/spider.html

⁶⁵⁹http://www.wadsworth.org/spider_doc/spider/docs/image_doc.html

⁶⁶⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SpiderReader.java>

⁶⁶¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁶⁶²<http://www.openmicroscopy.org/site/support/legacy/>


17.122 Targa

Extensions: .tga

Developer: [Truevision](#)⁶⁶³

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Targa*

We currently have:


- a Targa specification document
- a few Targa files


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [TargaReader.java](#)⁶⁶⁴


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁶⁶⁵ or the previous versions⁶⁶⁶ page to find documentation for the version you are using.

17.123 Text

Extensions: .txt

Support

BSD-licensed: 

Export: 


Officially Supported Versions:

Supported Metadata Fields: *Text*

We currently have:

We would like to have:

Ratings





Pixels: 

⁶⁶³<http://www.truevision.com>

⁶⁶⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/TargaReader.java>

⁶⁶⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁶⁶<http://www.openmicroscopy.org/site/support/legacy/>

Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [TextReader.java](#)⁶⁶⁷

Notes:


Reads tabular pixel data produced by a variety of software.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁶⁸ or the [previous versions](#)⁶⁶⁹ page to find documentation for the version you are using.

17.124 TIFF (Tagged Image File Format)

Extensions: .tif

Developer: Aldus and Microsoft

Owner: [Adobe](#)⁶⁷⁰**Support**BSD-licensed: Export: 

Officially Supported Versions:

Supported Metadata Fields: *TIFF (Tagged Image File Format)*



Sample Datasets:

- [LZW TIFF data gallery](#)⁶⁷¹
- [Big TIFF](#)⁶⁷²

We currently have:

- a [TIFF specification document](#)⁶⁷³ (v6.0, from 1992 June 3, in PDF)
- many TIFF datasets
- a few BigTIFF datasets

We would like to have:

RatingsPixels: Metadata: Openness: Presence: Utility: ⁶⁶⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/TextReader.java>⁶⁶⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁶⁶⁹<http://www.openmicroscopy.org/site/support/legacy/>⁶⁷⁰<http://www.adobe.com>⁶⁷¹http://marlin.life.utsa.edu/Data_Gallery.html⁶⁷²<http://www.awaresystems.be/imaging/tiff/bigtiff.html#samples>⁶⁷³<http://partners.adobe.com/asn/developer/PDFS/TN/TIFF6.pdf>

Additional Information

Source Code: [TiffReader.java](#)⁶⁷⁴ Source Code: [TiffWriter.java](#)⁶⁷⁵

Notes:

Bio-Formats can also read BigTIFF files (TIFF files larger than 4 GB). Bio-Formats can save image stacks as TIFF or BigTIFF.

See also:

[TIFF technical overview](#)⁶⁷⁶ [BigTIFF technical overview](#)⁶⁷⁷


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁷⁸ or the [previous versions](#)⁶⁷⁹ page to find documentation for the version you are using.

17.125 TillPhotonics TillVision

Extensions: .vws

Developer: [TILL Photonics](#)⁶⁸⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *TillPhotonics TillVision*


We currently have:

- several TillVision datasets


We would like to have:

- an official specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [TillVisionReader.java](#)⁶⁸¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁸² or the [previous versions](#)⁶⁸³ page to find documentation for the version you are using.

⁶⁷⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/TiffReader.java>

⁶⁷⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/TiffWriter.java>

⁶⁷⁶<http://www.awaresystems.be/imaging/tiff/faq.html#q3>

⁶⁷⁷<http://www.awaresystems.be/imaging/tiff/bigtiff.html>

⁶⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁸⁰<http://www.till-photonics.com/>

⁶⁸¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/TillVisionReader.java>

⁶⁸²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁶⁸³<http://www.openmicroscopy.org/site/support/legacy/>

17.126 Topometrix

Extensions: .tfr, .ffr, .zfr, .zfp, .2fl

Owner: [TopoMetrix \(now Veeco\)](#)⁶⁸⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Topometrix*


We currently have:

- Pascal code that reads Topometrix files (from ImageSXM)
- a few Topometrix files


We would like to have:


- an official specification document
- more Topometrix files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [TopometrixReader.java](#)⁶⁸⁵


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁸⁶ or the [previous versions](#)⁶⁸⁷ page to find documentation for the version you are using.

17.127 Trestle

Extensions: .tif, .sld, .jpg

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Trestle*

Sample Datasets:

- [OpenSlide](#)⁶⁸⁸

⁶⁸⁴<http://www.veeco.com/>

⁶⁸⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/TopometrixReader.java>

⁶⁸⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁸⁷<http://www.openmicroscopy.org/site/support/legacy/>


⁶⁸⁸<http://openslide.cs.cmu.edu/download/openslide-testdata/Trestle/>

We currently have:


- a few example datasets
- [developer documentation from the OpenSlide project](#)⁶⁸⁹


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [TrestleReader.java](#)⁶⁹⁰


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁹¹ or the [previous versions](#)⁶⁹² page to find documentation for the version you are using.

17.128 UBM

Extensions: .pr3

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *UBM*


We currently have:

- Pascal code that can read UBM files (from ImageSXM)
- one UBM file

We would like to have:


- an official specification document
- more UBM files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

⁶⁸⁹<http://openslide.org/Trestle/%20format/>

⁶⁹⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/TrestleReader.java>

⁶⁹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁹²<http://www.openmicroscopy.org/site/support/legacy/>

Additional Information

Source Code: [UBMReader.java](#)⁶⁹³

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁹⁴ or the [previous versions](#)⁶⁹⁵ page to find documentation for the version you are using.

17.129 Unisoku

Extensions: .dat, .hdr

Owner: [Unisoku](#)⁶⁹⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: [Unisoku](#)


We currently have:

- Pascal code that can read Unisoku files (from ImageSXM)
- a few Unisoku files


We would like to have:


- an official specification document
- more Unisoku files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [UnisokuReader.java](#)⁶⁹⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁹⁸ or the [previous versions](#)⁶⁹⁹ page to find documentation for the version you are using.

⁶⁹³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/UBMReader.java>

⁶⁹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁹⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁹⁶<http://www.unisoku.com>

⁶⁹⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/UnisokuReader.java>

⁶⁹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁶⁹⁹<http://www.openmicroscopy.org/site/support/legacy/>

17.130 Varian FDF

Extensions: .fdf

Developer: [Varian, Inc.](#)⁷⁰⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Varian FDF*


We currently have:

- a few Varian FDF datasets

We would like to have:

- an official specification document
- more Varian FDF datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [VarianFDFReader.java](#)⁷⁰¹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁰² or the [previous versions](#)⁷⁰³ page to find documentation for the version you are using.

17.131 Veeco AFM

Extensions: .hdf

Developer: [Veeco](#)⁷⁰⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Veeco AFM*

We currently have:

⁷⁰⁰<http://www.varianinc.com>

⁷⁰¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VarianFDFReader.java>

⁷⁰²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁰³<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁰⁴<http://www.veeco.com>


- a few sample datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [VeecoReader.java](#)⁷⁰⁵


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁰⁶ or the [previous versions](#)⁷⁰⁷ page to find documentation for the version you are using.

17.132 VG SAM

Extensions: .dti

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: [VG SAM](#)


We currently have:

- a few VG-SAM files

We would like to have:


- an official specification document
- more VG-SAM files


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [VGSAMReader.java](#)⁷⁰⁸

Notes:

⁷⁰⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VeecoReader.java>

⁷⁰⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁰⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁰⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VGSAMReader.java>


Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁷⁰⁹ or the previous versions⁷¹⁰ page to find documentation for the version you are using.

17.133 VisiTech XYS

Extensions: .xys, .html

Developer: [VisiTech International](#)⁷¹¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *VisiTech XYS*


We currently have:

- several VisiTech datasets


We would like to have:


- an official specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [VisitechReader.java](#)⁷¹²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁷¹³ or the previous versions⁷¹⁴ page to find documentation for the version you are using.

17.134 Volocity

Extensions: .mvd2

Developer: [PerkinElmer](#)⁷¹⁵

Support

BSD-licensed: 

Export: 

⁷⁰⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷¹⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁷¹¹<http://www.visitech.co.uk/>

⁷¹²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VisitechReader.java>

⁷¹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷¹⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁷¹⁵<http://www.perkinelmer.com/pages/020/cellularimaging/products/volocity.xhtml>

Officially Supported Versions:

Supported Metadata Fields: *Volocity*

Sample Datasets:

- [PerkinElmer Downloads](#)⁷¹⁶


We currently have:

- many example Volocity datasets


We would like to have:


- an official specification document
- any Volocity datasets that do not open correctly


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [VolocityReader.java](#)⁷¹⁷

Notes:

.mvd2 files are [Metakit database files](#)⁷¹⁸.


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷¹⁹ or the [previous versions](#)⁷²⁰ page to find documentation for the version you are using.

17.135 Volocity Library Clipping

Extensions: .acff

Developer: [PerkinElmer](#)⁷²¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Volocity Library Clipping*

We currently have:

- several Volocity library clipping datasets

We would like to have:

- any datasets that do not open correctly
- an official specification document

⁷¹⁶<http://cellularimaging.perkinelmer.com/downloads/>





⁷¹⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VolocityReader.java>

⁷¹⁸<http://equi4.com/metakit/>

⁷¹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷²⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁷²¹<http://www.perkinelmer.com/pages/020/cellularimaging/products/volocity.xhtml>

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [VolocityClippingReader.java](#)⁷²²

Notes:


RGB .acff files are not yet supported. See [#6413](#)⁷²³.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷²⁴ or the [previous versions](#)⁷²⁵ page to find documentation for the version you are using.

17.136 WA-TOP

Extensions: .wat

Developer: WA Technology

Owner: [Oxford Instruments](#)⁷²⁶**Support**BSD-licensed: Export: 

Officially Supported Versions:



Supported Metadata Fields: [WA-TOP](#)

We currently have:

- Pascal code that can read WA-TOP files (from ImageSXM)
- a few WA-TOP files

We would like to have:

- an official specification document
- more WA-TOP files

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**⁷²²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VolocityClippingReader.java>⁷²³<http://trac.openmicroscopy.org.uk/ome/ticket/6413>⁷²⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁷²⁵<http://www.openmicroscopy.org/site/support/legacy/>⁷²⁶<http://www.oxinst.com>

Source Code: [WATOPReader.java](#)⁷²⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁷²⁸ or the previous versions⁷²⁹ page to find documentation for the version you are using.

17.137 Windows Bitmap

Extensions: .bmp

Developer: Microsoft and IBM

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Windows Bitmap*

Freely Available Software:

- [BMP Writer plugin for ImageJ](#)⁷³⁰

We currently have:

- many BMP datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [BMPReader.java](#)⁷³¹

Notes:

Compressed BMP files are currently not supported.

See also:

[Technical Overview](#)⁷³²

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁷³³ or the previous versions⁷³⁴ page to find documentation for the version you are using.

⁷²⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/WATOPReader.java>

⁷²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷²⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁷³⁰<http://rsb.info.nih.gov/ij/plugins/bmp-writer.html>

⁷³¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/BMPReader.java>

⁷³²<http://www.faq.s.org/faqs/graphics/fileformats-faq/part3/section-18.html>

⁷³³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁷³⁴<http://www.openmicroscopy.org/site/support/legacy/>

17.138 Woolz

Extensions: .wlz

Developer: [MRC Human Genetics Unit](#)⁷³⁵

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: [Woolz](#)

Freely Available Software:


- [Woolz](#)⁷³⁶

We currently have:

- a few Woolz datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [WlzReader.java](#)⁷³⁷ Source Code: [WlzWriter.java](#)⁷³⁸

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷³⁹ or the [previous versions](#)⁷⁴⁰ page to find documentation for the version you are using.


17.139 Zeiss Axio CSM

Extensions: .lms

Developer: [Carl Zeiss Microscopy GmbH](#)⁷⁴¹

Owner: [Carl Zeiss Microscopy GmbH](#)⁷⁴²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

⁷³⁵http://www.emouseatlas.org/emap/analysis_tools_resources/software/woolz.html

⁷³⁶http://www.emouseatlas.org/emap/analysis_tools_resources/software/woolz.html

⁷³⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/WlzReader.java>

⁷³⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/out/WlzWriter.java>

⁷³⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁴⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁴¹<http://www.zeiss.com/microscopy/>

⁷⁴²<http://www.zeiss.com/microscopy/>


Supported Metadata Fields: *Zeiss Axio CSM*


We currently have:


- one example dataset


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [ZeissLMSReader.java](#)⁷⁴³

Notes:

This should not be confused with the more common Zeiss LSM format, which has a similar extension. As far as we know, the Axio CSM 700 system is the only one which saves files in the .lms format.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁴⁴ or the [previous versions](#)⁷⁴⁵ page to find documentation for the version you are using.


17.140 Zeiss AxioVision TIFF

Extensions: .xml, .tiff

Developer: [Carl Zeiss Microscopy GmbH](#)⁷⁴⁶

Owner: [Carl Zeiss Microscopy GmbH](#)⁷⁴⁷

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Zeiss AxioVision TIFF*

Freely Available Software:

- [Zeiss ZEN Lite](#)⁷⁴⁸

We currently have:

- many example datasets

We would like to have:

- an official specification document

⁷⁴³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissLMSReader.java>






⁷⁴⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁴⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁴⁶<http://www.zeiss.com/microscopy/>

⁷⁴⁷<http://www.zeiss.com/microscopy/>

⁷⁴⁸http://www.zeiss.com/microscopy/en_de/products/microscope-software/zen-lite.html


RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [ZeissTIFFReader.java](#)⁷⁴⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁵⁰ or the [previous versions](#)⁷⁵¹ page to find documentation for the version you are using.

17.141 Zeiss AxioVision ZVI (Zeiss Vision Image)

Extensions: .zvi

Developer: [Carl Zeiss Microscopy GmbH \(AxioVision\)](#)⁷⁵²Owner: [Carl Zeiss Microscopy GmbH](#)⁷⁵³**Support**BSD-licensed: Export: 

Officially Supported Versions: 1.0, 2.0

Supported Metadata Fields: *Zeiss AxioVision ZVI (Zeiss Vision Image)*


Freely Available Software:

- [Zeiss Axiovision LE](#)⁷⁵⁴

We currently have:

- a ZVI specification document (v2.0.5, from 2010 August, in PDF)
- an older ZVI specification document (v2.0.2, from 2006 August 23, in PDF)
- an older ZVI specification document (v2.0.1, from 2005 April 21, in PDF)
- an older ZVI specification document (v1.0.26.01.01, from 2001 January 29, in DOC)
- Zeiss' ZvImageReader code (v1.0, from 2001 January 25, in C++)
- many ZVI datasets

We would like to have:

RatingsPixels: Metadata: Openness: 

⁷⁴⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissTIFFReader.java>


⁷⁵⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁷⁵¹<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁵²http://www.zeiss.com/microscopy/en_de/products/microscope-software/axiovision-for-biology.html

⁷⁵³<http://www.zeiss.com/microscopy/>

⁷⁵⁴http://www.zeiss.com/microscopy/en_de/downloads/axiovision.html

Presence: 

Utility: 

Additional Information

Source Code: [ZeissZVIReader.java](#)⁷⁵⁵

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

Bio-Formats uses a modified version of the [Apache Jakarta POI library](#)⁷⁵⁶ to read ZVI files. ImageJ/FIJI will use the ZVI reader plugin in preference to Bio-Formats if both are installed. If you have a problem which is solved by opening the file using the Bio-Formats Importer plugin, you can just remove the ZVI_Reader.class from the plugins folder.

Commercial applications that support ZVI include [Bitplane Imaris](#)⁷⁵⁷.

See also:

[Axiovision software overview](#)⁷⁵⁸


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁵⁹ or the [previous versions](#)⁷⁶⁰ page to find documentation for the version you are using.

17.142 Zeiss CZI

Extensions: [.czi](#)⁷⁶¹

Developer: [Carl Zeiss Microscopy GmbH](#)⁷⁶²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: [Zeiss CZI](#)

Freely Available Software:


- [Zeiss ZEN](#)⁷⁶³

We currently have:

- many example datasets
- official specification documents

We would like to have:

Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

⁷⁵⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissZVIReader.java>

⁷⁵⁶<http://jakarta.apache.org/poi/>

⁷⁵⁷<http://www.bitplane.com/>

⁷⁵⁸http://www.zeiss.com/microscopy/en_de/products/microscope-software/axiovision-for-biology.html


⁷⁵⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁶⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁶¹<http://www.zeiss.com/czi>

⁷⁶²<http://www.zeiss.com/czi>

⁷⁶³http://www.zeiss.com/microscopy/en_de/products/microscope-software/zen.html

Utility: 

Additional Information

Source Code: [ZeissCZIReader.java](#)⁷⁶⁴

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁶⁵ or the [previous versions](#)⁷⁶⁶ page to find documentation for the version you are using.

17.143 Zeiss LSM (Laser Scanning Microscope) 510/710

Extensions: .lsm, .mdb

Owner: [Carl Zeiss Microscopy GmbH](#)⁷⁶⁷

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Zeiss LSM (Laser Scanning Microscope) 510/710*

Freely Available Software:


- [Zeiss LSM Image Browser](#)⁷⁶⁸
- [LSM Toolbox plugin for ImageJ](#)⁷⁶⁹
- [LSM Reader plugin for ImageJ](#)⁷⁷⁰
- [DIMIN](#)⁷⁷¹

We currently have:


- LSM specification v3.2, from 2003 March 12, in PDF
- LSM specification v5.5, from 2009 November 23, in PDF
- LSM specification v6.0, from 2010 September 28, in PDF
- many LSM datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

⁷⁶⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissCZIReader.java>

⁷⁶⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁶⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁶⁷<http://www.zeiss.com/microscopy/>

⁷⁶⁸http://www.zeiss.com/microscopy/en_de/downloads/lsm-5-series.html

⁷⁶⁹<http://imagejdocu.tudor.lu/Members/ppirrotte/lsmtoolbox>

⁷⁷⁰<http://rsb.info.nih.gov/ij/plugins/lsm-reader.html>

⁷⁷¹<http://www.dimin.net/>

Source Code: [ZeissLSMReader.java](#)⁷⁷²

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

Bio-Formats uses the [MDB Tools Java port](#)⁷⁷³

Commercial applications that support this format include:

- [SVI Huygens](#)⁷⁷⁴
- [Bitplane Imaris](#)⁷⁷⁵
- [Amira](#)⁷⁷⁶
- [Image-Pro Plus](#)⁷⁷⁷

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)⁷⁷⁸ or the [previous versions](#)⁷⁷⁹ page to find documentation for the version you are using.

⁷⁷²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissLSMReader.java>

⁷⁷³<http://mdbtools.sourceforge.net/>

⁷⁷⁴<http://www2.svi.nl/>

⁷⁷⁵<http://www.bitplane.com/>

⁷⁷⁶<http://www.amira.com/>

⁷⁷⁷<http://www.mediacy.com/>

⁷⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

SUMMARY OF SUPPORTED METADATA FIELDS

18.1 Format readers

Format	Supported	Unsupported	Partial	Unknown/Missing
<i>AFIReader</i>	30	0	0	445
<i>AIMReader</i>	22	0	0	453
<i>APLReader</i>	21	0	0	454
<i>APNGReader</i>	19	0	0	456
<i>ARFReader</i>	19	0	0	456
<i>AVIReader</i>	19	0	0	456
<i>AliconaReader</i>	33	0	0	442
<i>AmiraReader</i>	22	0	0	453
<i>AnalyzeReader</i>	24	0	0	451
<i>BDReader</i>	57	0	0	418
<i>BIFormatReader</i>	19	0	0	456
<i>BMPReader</i>	21	0	0	454
<i>BaseTiffReader</i>	28	0	0	447
<i>BaseZeissReader</i>	83	0	0	392
<i>BioRadGelReader</i>	21	0	0	454
<i>BioRadReader</i>	40	0	0	435
<i>BioRadSCNReader</i>	29	0	0	446
<i>BrukerReader</i>	23	0	0	452
<i>BurleighReader</i>	22	0	0	453
<i>CanonRawReader</i>	19	0	0	456
<i>CellH5Reader</i>	31	0	0	444
<i>CellSensReader</i>	46	0	0	429
<i>CellVoyagerReader</i>	34	0	0	441
<i>CellWorxReader</i>	45	0	0	430
<i>CellomicsReader</i>	31	0	0	444
<i>DNGReader</i>	19	0	0	456
<i>DeltavisionReader</i>	52	0	0	423
<i>DicomReader</i>	23	0	0	452
<i>EPSReader</i>	19	0	0	456
<i>Ecat7Reader</i>	23	0	0	452
<i>FEIReader</i>	19	0	0	456
<i>FEITiffReader</i>	39	0	0	436
<i>FV1000Reader</i>	113	0	0	362
<i>FakeReader</i>	49	0	0	426
<i>FilePatternReader</i>	19	0	0	456
<i>FitsReader</i>	19	0	0	456
<i>FlexReader</i>	69	0	0	406
<i>FlowSightReader</i>	20	0	0	455
<i>FluoviewReader</i>	49	0	0	426
<i>FujiReader</i>	23	0	0	452
<i>GIFReader</i>	19	0	0	456
Continued on next page				

Table 18.1 – continued from previous page

Format	Supported	Unsupported	Partial	Unknown/Missing
<i>GatanDM2Reader</i>	30	0	0	445
<i>GatanReader</i>	36	0	0	439
<i>GelReader</i>	21	0	0	454
<i>HISReader</i>	27	0	0	448
<i>HRDGDFReader</i>	21	0	0	454
<i>HamamatsuVMSReader</i>	26	0	0	449
<i>HitachiReader</i>	31	0	0	444
<i>I2IReader</i>	19	0	0	456
<i>ICSReader</i>	72	0	0	403
<i>IM3Reader</i>	19	0	0	456
<i>IMODReader</i>	44	0	0	431
<i>INRReader</i>	22	0	0	453
<i>IPLabReader</i>	31	0	0	444
<i>IPWReader</i>	20	0	0	455
<i>ImaconReader</i>	23	0	0	452
<i>ImageIOReader</i>	19	0	0	456
<i>ImagicReader</i>	22	0	0	453
<i>ImarisHDFReader</i>	23	0	0	452
<i>ImarisReader</i>	32	0	0	443
<i>ImarisTiffReader</i>	23	0	0	452
<i>ImprovisionTiffReader</i>	25	0	0	450
<i>InspectorReader</i>	19	0	0	456
<i>InCell3000Reader</i>	19	0	0	456
<i>InCellReader</i>	67	0	0	408
<i>InveonReader</i>	30	0	0	445
<i>IvisionReader</i>	34	0	0	441
<i>JEOLReader</i>	19	0	0	456
<i>JPEG2000Reader</i>	19	0	0	456
<i>JPEGReader</i>	19	0	0	456
<i>JPKReader</i>	19	0	0	456
<i>JPXReader</i>	19	0	0	456
<i>KhorosReader</i>	19	0	0	456
<i>KodakReader</i>	26	0	0	449
<i>L2DReader</i>	29	0	0	446
<i>LEOReader</i>	27	0	0	448
<i>LIFReader</i>	85	0	0	390
<i>LIMReader</i>	19	0	0	456
<i>LegacyND2Reader</i>	19	0	0	456
<i>LegacyQTReader</i>	19	0	0	456
<i>LeicaReader</i>	56	0	0	419
<i>LeicaSCNReader</i>	33	0	0	442
<i>LiFlinReader</i>	25	0	0	450
<i>MIASReader</i>	64	0	0	411
<i>MINCReader</i>	23	0	0	452
<i>MNGReader</i>	19	0	0	456
<i>MRCReader</i>	22	0	0	453
<i>MRWReader</i>	19	0	0	456
<i>MetamorphReader</i>	46	0	0	429
<i>MetamorphTiffReader</i>	38	0	0	437
<i>MicromanagerReader</i>	38	0	0	437
<i>MinimalTiffReader</i>	19	0	0	456
<i>MolecularImagingReader</i>	21	0	0	454
<i>NAFReader</i>	19	0	0	456
<i>ND2Reader</i>	19	0	0	456
<i>NDPIReader</i>	28	0	0	447

Continued on next page

Table 18.1 – continued from previous page

Format	Supported	Unsupported	Partial	Unknown/Missing
<i>NDPISReader</i>	19	0	0	456
<i>NRRDReader</i>	22	0	0	453
<i>NativeND2Reader</i>	52	0	0	423
<i>NativeQTReader</i>	19	0	0	456
<i>NiftiReader</i>	24	0	0	451
<i>NikonElementsTiffReader</i>	50	0	0	425
<i>NikonReader</i>	19	0	0	456
<i>NikonTiffReader</i>	47	0	0	428
<i>OBFReader</i>	19	0	0	456
<i>OMETiffReader</i>	19	0	0	456
<i>OMEXMLReader</i>	19	0	0	456
<i>OpenlabRawReader</i>	19	0	0	456
<i>OpenlabReader</i>	32	0	0	443
<i>OperettaReader</i>	43	0	0	432
<i>OxfordInstrumentsReader</i>	22	0	0	453
<i>PCIRReader</i>	29	0	0	446
<i>PCORAWReader</i>	26	0	0	449
<i>PCXReader</i>	19	0	0	456
<i>PDSReader</i>	23	0	0	452
<i>PGMReader</i>	19	0	0	456
<i>PQBinReader</i>	21	0	0	454
<i>PSDReader</i>	19	0	0	456
<i>PerkinElmerReader</i>	30	0	0	445
<i>PhotoshopTiffReader</i>	19	0	0	456
<i>PictReader</i>	19	0	0	456
<i>PovrayReader</i>	19	0	0	456
<i>PrairieReader</i>	46	0	0	429
<i>PyramidTiffReader</i>	19	0	0	456
<i>QTReader</i>	19	0	0	456
<i>QuesantReader</i>	22	0	0	453
<i>RHKReader</i>	22	0	0	453
<i>SBIGReader</i>	22	0	0	453
<i>SDTReader</i>	19	0	0	456
<i>SEQReader</i>	19	0	0	456
<i>SIFReader</i>	20	0	0	455
<i>SISReader</i>	33	0	0	442
<i>SMCameraReader</i>	19	0	0	456
<i>SVSReader</i>	29	0	0	446
<i>ScanrReader</i>	43	0	0	432
<i>ScreenReader</i>	34	0	0	441
<i>SeikoReader</i>	22	0	0	453
<i>SimplePCITiffReader</i>	33	0	0	442
<i>SlideBook6Reader</i>	37	0	0	438
<i>SlidebookReader</i>	34	0	0	441
<i>SlidebookTiffReader</i>	30	0	0	445
<i>SpiderReader</i>	21	0	0	454
<i>TCSReader</i>	22	0	0	453
<i>TargaReader</i>	20	0	0	455
<i>TextReader</i>	19	0	0	456
<i>TiffDelegateReader</i>	19	0	0	456
<i>TiffJAIRReader</i>	19	0	0	456
<i>TiffReader</i>	22	0	0	453
<i>TileJPEGReader</i>	19	0	0	456
<i>TillVisionReader</i>	22	0	0	453
<i>TopometrixReader</i>	22	0	0	453

Continued on next page

Table 18.1 – continued from previous page

Format	Supported	Unsupported	Partial	Unknown/Missing
<i>TrestleReader</i>	26	0	0	449
<i>UBMReader</i>	19	0	0	456
<i>UnisokuReader</i>	22	0	0	453
<i>VGSAMReader</i>	19	0	0	456
<i>VarianFDFReader</i>	25	0	0	450
<i>VeecoReader</i>	19	0	0	456
<i>VisitechReader</i>	19	0	0	456
<i>VolocityClippingReader</i>	19	0	0	456
<i>VolocityReader</i>	38	0	0	437
<i>WATOPReader</i>	22	0	0	453
<i>WlzReader</i>	26	0	0	449
<i>ZeissCZIReader</i>	158	0	0	317
<i>ZeissLMSReader</i>	23	0	0	452
<i>ZeissLSMReader</i>	101	0	0	374
<i>ZeissTIFFReader</i>	19	0	0	456
<i>ZeissZVIReader</i>	19	0	0	456
<i>ZipReader</i>	19	0	0	456

18.2 Metadata fields

Field	Supported	Unsupported	Partial	Unknown/Missing
Arc - ID ¹	0	0	0	168
Arc - LotNumber ²	1	0	0	167
Arc - Manufacturer ³	1	0	0	167
Arc - Model ⁴	1	0	0	167
Arc - Power ⁵	1	0	0	167
Arc - SerialNumber ⁶	1	0	0	167
Arc - Type ⁷	0	0	0	168
BooleanAnnotation - AnnotationRef ⁸	0	0	0	168
BooleanAnnotation - Description ⁹	0	0	0	168
BooleanAnnotation - ID ¹⁰	1	0	0	167
BooleanAnnotation - Namespace ¹¹	1	0	0	167
BooleanAnnotation - Value ¹²	1	0	0	167
Channel - AcquisitionMode ¹³	4	0	0	164
Channel - AnnotationRef ¹⁴	0	0	0	168

Continued on next page

¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Arc_Type

⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID

⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Description

¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID

¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace

¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#BooleanAnnotation_Value

¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_AcquisitionMode

¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Channel - Color ¹⁵	8	0	0	160
Channel - Contrast-Method ¹⁶	0	0	0	168
Channel - Emission-Wavelength ¹⁷	18	0	0	150
Channel - Excitation-Wavelength ¹⁸	17	0	0	151
Channel - FilterSetRef ¹⁹	1	0	0	167
Channel - Fluor ²⁰	1	0	0	167
Channel - ID ²¹	168	0	0	0
Channel - IlluminationType ²²	3	0	0	165
Channel - Light-SourceSettingsAttenuation ²³	1	0	0	167
Channel - Light-SourceSettingsID ²⁴	5	0	0	163
Channel - Light-SourceSettingsWavelength ²⁵	2	0	0	166
Channel - NDFilter ²⁶	2	0	0	166
Channel - Name ²⁷	34	0	0	134
Channel - Pinhole-Size ²⁸	10	0	0	158
Channel - Pockel-CellSetting ²⁹	0	0	0	168
Channel - Samples-PerPixel ³⁰	168	0	0	0
CommentAnnotation - AnnotationRef ³¹	0	0	0	168
CommentAnnotation - Description ³²	0	0	0	168
CommentAnnotation - ID ³³	1	0	0	167
CommentAnnotation - Namespace ³⁴	1	0	0	167
CommentAnnotation - Value ³⁵	1	0	0	167

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¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ContrastMethod¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterSetRef_ID²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Fluor²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_IlluminationType²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_Attenuation²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_Wavelength²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_NDFilter²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PockelCellSetting³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Description³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#CommentAnnotation_Value

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Dataset - Annotation-Ref ³⁶	0	0	0	168
Dataset - Description ³⁷	0	0	0	168
Dataset - ExperimenterGroupRef ³⁸	0	0	0	168
Dataset - ExperimenterRef ³⁹	0	0	0	168
Dataset - ID ⁴⁰	0	0	0	168
Dataset - ImageRef ⁴¹	0	0	0	168
Dataset - Name ⁴²	0	0	0	168
Detector - AmplificationGain ⁴³	2	0	0	166
Detector - Gain ⁴⁴	6	0	0	162
Detector - ID ⁴⁵	35	0	0	133
Detector - LotNumber ⁴⁶	1	0	0	167
Detector - Manufacturer ⁴⁷	5	0	0	163
Detector - Model ⁴⁸	14	0	0	154
Detector - Offset ⁴⁹	6	0	0	162
Detector - Serial-Number ⁵⁰	4	0	0	164
Detector - Type ⁵¹	28	0	0	140
Detector - Voltage ⁵²	2	0	0	166
Detector - Zoom ⁵³	4	0	0	164
DetectorSettings - Binning ⁵⁴	18	0	0	150
DetectorSettings - Gain ⁵⁵	20	0	0	148
DetectorSettings - ID ⁵⁶	33	0	0	135
DetectorSettings - Offset ⁵⁷	9	0	0	159
DetectorSettings - ReadOutRate ⁵⁸	5	0	0	163
Continued on next page				

³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dataset_Description³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterGroupRef_ID³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dataset_ID⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dataset_Name⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_AmplificationGain⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Voltage⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Zoom⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
DetectorSettings - Voltage ⁵⁹	6	0	0	162
Dichroic - ID ⁶⁰	6	0	0	162
Dichroic - LotNumber ⁶¹	1	0	0	167
Dichroic - Manufacturer ⁶²	1	0	0	167
Dichroic - Model ⁶³	6	0	0	162
Dichroic - Serial-Number ⁶⁴	1	0	0	167
DoubleAnnotation - AnnotationRef ⁶⁵	0	0	0	168
DoubleAnnotation - Description ⁶⁶	0	0	0	168
DoubleAnnotation - ID ⁶⁷	1	0	0	167
DoubleAnnotation - Namespace ⁶⁸	1	0	0	167
DoubleAnnotation - Value ⁶⁹	1	0	0	167
Ellipse - FillColor ⁷⁰	0	0	0	168
Ellipse - FillRule ⁷¹	0	0	0	168
Ellipse - FontFamily ⁷²	0	0	0	168
Ellipse - FontSize ⁷³	2	0	0	166
Ellipse - FontStyle ⁷⁴	0	0	0	168
Ellipse - ID ⁷⁵	5	0	0	163
Ellipse - LineCap ⁷⁶	0	0	0	168
Ellipse - Locked ⁷⁷	0	0	0	168
Ellipse - RadiusX ⁷⁸	5	0	0	163
Ellipse - RadiusY ⁷⁹	5	0	0	163
Ellipse - Stroke-Color ⁸⁰	0	0	0	168
Ellipse - StrokeDashArray ⁸¹	0	0	0	168

Continued on next page

⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Description⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#DoubleAnnotation_Value⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontFamily⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontStyle⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_LineCap⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Locked⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusX⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusY⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Ellipse - StrokeWidth ⁸²	2	0	0	166
Ellipse - Text ⁸³	3	0	0	165
Ellipse - TheC ⁸⁴	0	0	0	168
Ellipse - TheT ⁸⁵	2	0	0	166
Ellipse - TheZ ⁸⁶	2	0	0	166
Ellipse - Transform ⁸⁷	2	0	0	166
Ellipse - Visible ⁸⁸	0	0	0	168
Ellipse - X ⁸⁹	5	0	0	163
Ellipse - Y ⁹⁰	5	0	0	163
Experiment - Description ⁹¹	1	0	0	167
Experiment - ExperimenterRef ⁹²	0	0	0	168
Experiment - ID ⁹³	5	0	0	163
Experiment - Type ⁹⁴	5	0	0	163
Experimenter - AnnotationRef ⁹⁵	0	0	0	168
Experimenter - Email ⁹⁶	2	0	0	166
Experimenter - First-Name ⁹⁷	5	0	0	163
Experimenter - ID ⁹⁸	11	0	0	157
Experimenter - Institution ⁹⁹	4	0	0	164
Experimenter - Last-Name ¹⁰⁰	9	0	0	159
Experimenter - MiddleName ¹⁰¹	1	0	0	167
Experimenter - User-Name ¹⁰²	3	0	0	165
ExperimenterGroup - AnnotationRef ¹⁰³	0	0	0	168
ExperimenterGroup - Description ¹⁰⁴	0	0	0	168
Continued on next page				

⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Visible⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_X⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_Y⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Description⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_Email⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_FirstName⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_Institution¹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName¹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_MiddleName¹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_UserName¹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID¹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterGroup_Description

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
ExperimenterGroup - ExperimenterRef ¹⁰⁵	0	0	0	168
ExperimenterGroup - ID ¹⁰⁶	0	0	0	168
ExperimenterGroup - Leader ¹⁰⁷	0	0	0	168
ExperimenterGroup - Name ¹⁰⁸	0	0	0	168
Filament - ID ¹⁰⁹	0	0	0	168
Filament - LotNum- ber ¹¹⁰	1	0	0	167
Filament - Manufac- turer ¹¹¹	1	0	0	167
Filament - Model ¹¹²	1	0	0	167
Filament - Power ¹¹³	1	0	0	167
Filament - Serial- Number ¹¹⁴	1	0	0	167
Filament - Type ¹¹⁵	0	0	0	168
FileAnnotation - An- notationRef ¹¹⁶	0	0	0	168
FileAnnotation - De- scription ¹¹⁷	0	0	0	168
FileAnnotation - ID ¹¹⁸	0	0	0	168
FileAnnotation - Namespace ¹¹⁹	0	0	0	168
Filter - Filter- Wheel ¹²⁰	2	0	0	166
Filter - ID ¹²¹	8	0	0	160
Filter - LotNum- ber ¹²²	1	0	0	167
Filter - Manufac- turer ¹²³	1	0	0	167
Filter - Model ¹²⁴	8	0	0	160
Filter - SerialNum- ber ¹²⁵	1	0	0	167
Filter - Type ¹²⁶	2	0	0	166
Continued on next page				

¹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID¹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterGroup_ID¹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Leader_ID¹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterGroup_Name¹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID¹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber¹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer¹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model¹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power¹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber¹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filament_Type¹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID¹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Description¹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID¹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace¹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_FilterWheel¹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID¹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber¹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer¹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model¹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber¹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_Type

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
FilterSet - DichroicRef ¹²⁷	2	0	0	166
FilterSet - Emission-FilterRef ¹²⁸	2	0	0	166
FilterSet - ExcitationFilterRef ¹²⁹	2	0	0	166
FilterSet - ID ¹³⁰	2	0	0	166
FilterSet - LotNumber ¹³¹	1	0	0	167
FilterSet - Manufacturer ¹³²	1	0	0	167
FilterSet - Model ¹³³	2	0	0	166
FilterSet - Serial-Number ¹³⁴	1	0	0	167
Image - Acquisition-Date ¹³⁵	168	0	0	0
Image - Annotation-Ref ¹³⁶	1	0	0	167
Image - Description ¹³⁷	45	0	0	123
Image - ExperimentRef ¹³⁸	2	0	0	166
Image - ExperimenterGroupRef ¹³⁹	0	0	0	168
Image - ExperimenterRef ¹⁴⁰	6	0	0	162
Image - ID ¹⁴¹	168	0	0	0
Image - InstrumentRef ¹⁴²	46	0	0	122
Image - Microbeam-ManipulationRef ¹⁴³	0	0	0	168
Image - Name ¹⁴⁴	168	0	0	0
Image - ROIRef ¹⁴⁵	12	0	0	156
ImagingEnvironment - AirPressure ¹⁴⁶	1	0	0	167
ImagingEnvironment - CO2Percent ¹⁴⁷	1	0	0	167

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¹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID¹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID¹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID¹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterSet_ID¹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber¹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer¹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model¹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber¹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate¹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID¹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description¹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimentRef_ID¹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterGroupRef_ID¹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID¹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID¹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID¹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#MicrobeamManipulationRef_ID¹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name¹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID¹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_AirPressure¹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_CO2Percent

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
ImagingEnvironment - Humidity ¹⁴⁸	1	0	0	167
ImagingEnvironment - Temperature ¹⁴⁹	10	0	0	158
Instrument - ID ¹⁵⁰	52	0	0	116
Label - FillColor ¹⁵¹	0	0	0	168
Label - FillRule ¹⁵²	0	0	0	168
Label - FontFamily ¹⁵³	0	0	0	168
Label - FontSize ¹⁵⁴	2	0	0	166
Label - FontStyle ¹⁵⁵	0	0	0	168
Label - ID ¹⁵⁶	3	0	0	165
Label - LineCap ¹⁵⁷	0	0	0	168
Label - Locked ¹⁵⁸	0	0	0	168
Label - StrokeColor ¹⁵⁹	0	0	0	168
Label - StrokeDashArray ¹⁶⁰	0	0	0	168
Label - StrokeWidth ¹⁶¹	2	0	0	166
Label - Text ¹⁶²	3	0	0	165
Label - TheC ¹⁶³	0	0	0	168
Label - TheT ¹⁶⁴	0	0	0	168
Label - TheZ ¹⁶⁵	0	0	0	168
Label - Transform ¹⁶⁶	0	0	0	168
Label - Visible ¹⁶⁷	0	0	0	168
Label - X ¹⁶⁸	3	0	0	165
Label - Y ¹⁶⁹	3	0	0	165
Laser - Frequency-Multiplication ¹⁷⁰	0	0	0	168
Laser - ID ¹⁷¹	9	0	0	159
Laser - Laser-Medium ¹⁷²	8	0	0	160
Laser - LotNumber ¹⁷³	1	0	0	167

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- ¹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Humidity
- ¹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature
- ¹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID
- ¹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor
- ¹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule
- ¹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontFamily
- ¹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize
- ¹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontStyle
- ¹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID
- ¹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_LineCap
- ¹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Locked
- ¹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor
- ¹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray
- ¹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth
- ¹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text
- ¹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC
- ¹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT
- ¹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ
- ¹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform
- ¹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Visible
- ¹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_X
- ¹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_Y
- ¹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_FrequencyMultiplication
- ¹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID
- ¹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium
- ¹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Laser - Manufacturer ¹⁷⁴	2	0	0	166
Laser - Model ¹⁷⁵	4	0	0	164
Laser - PockelCell ¹⁷⁶	0	0	0	168
Laser - Power ¹⁷⁷	3	0	0	165
Laser - Pulse ¹⁷⁸	0	0	0	168
Laser - Pump ¹⁷⁹	0	0	0	168
Laser - Repetition-Rate ¹⁸⁰	1	0	0	167
Laser - SerialNumber ¹⁸¹	1	0	0	167
Laser - Tuneable ¹⁸²	0	0	0	168
Laser - Type ¹⁸³	8	0	0	160
Laser - Wavelength ¹⁸⁴	7	0	0	161
LightEmittingDiode - ID ¹⁸⁵	0	0	0	168
LightEmittingDiode - LotNumber ¹⁸⁶	1	0	0	167
LightEmittingDiode - Manufacturer ¹⁸⁷	1	0	0	167
LightEmittingDiode - Model ¹⁸⁸	1	0	0	167
LightEmittingDiode - Power ¹⁸⁹	1	0	0	167
LightEmittingDiode - SerialNumber ¹⁹⁰	1	0	0	167
LightPath - DichroicRef ¹⁹¹	3	0	0	165
LightPath - EmissionFilterRef ¹⁹²	5	0	0	163
LightPath - ExcitationFilterRef ¹⁹³	1	0	0	167
Line - FillColor ¹⁹⁴	0	0	0	168
Line - FillRule ¹⁹⁵	0	0	0	168
Line - FontFamily ¹⁹⁶	0	0	0	168
Continued on next page				

¹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer¹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model¹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_PockelCell¹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power¹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Pulse¹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pump_ID¹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_RepetitionRate¹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber¹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Tuneable¹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type¹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength¹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID¹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber¹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer¹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model¹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power¹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber¹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID¹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID¹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID¹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor¹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule¹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontFamily

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Line - FontSize ¹⁹⁷	2	0	0	166
Line - FontStyle ¹⁹⁸	0	0	0	168
Line - ID ¹⁹⁹	5	0	0	163
Line - LineCap ²⁰⁰	0	0	0	168
Line - Locked ²⁰¹	0	0	0	168
Line - MarkerEnd ²⁰²	0	0	0	168
Line - MarkerStart ²⁰³	0	0	0	168
Line - StrokeColor ²⁰⁴	0	0	0	168
Line - StrokeDashArray ²⁰⁵	0	0	0	168
Line - StrokeWidth ²⁰⁶	2	0	0	166
Line - Text ²⁰⁷	2	0	0	166
Line - TheC ²⁰⁸	0	0	0	168
Line - TheT ²⁰⁹	1	0	0	167
Line - TheZ ²¹⁰	1	0	0	167
Line - Transform ²¹¹	1	0	0	167
Line - Visible ²¹²	0	0	0	168
Line - X1 ²¹³	5	0	0	163
Line - X2 ²¹⁴	5	0	0	163
Line - Y1 ²¹⁵	5	0	0	163
Line - Y2 ²¹⁶	5	0	0	163
ListAnnotation - AnnotationRef ²¹⁷	0	0	0	168
ListAnnotation - Description ²¹⁸	0	0	0	168
ListAnnotation - ID ²¹⁹	0	0	0	168
ListAnnotation - Namespace ²²⁰	0	0	0	168
LongAnnotation - AnnotationRef ²²¹	0	0	0	168
LongAnnotation - Description ²²²	0	0	0	168

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¹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize¹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontStyle¹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID²⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_LineCap²⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Locked²⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_MarkerEnd²⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_MarkerStart²⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor²⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray²⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth²⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text²⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC²⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT²¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ²¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform²¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Visible²¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X1²¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X2²¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y1²¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y2²¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID²¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Description²¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID²²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace²²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID²²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Description

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
LongAnnotation - ID ²²³	1	0	0	167
LongAnnotation - Namespace ²²⁴	1	0	0	167
LongAnnotation - Value ²²⁵	1	0	0	167
Mask - FillColor ²²⁶	1	0	0	167
Mask - FillRule ²²⁷	0	0	0	168
Mask - FontFamily ²²⁸	0	0	0	168
Mask - FontSize ²²⁹	0	0	0	168
Mask - Height ²³⁰	2	0	0	166
Mask - ID ²³¹	2	0	0	166
Mask - LineCap ²³²	0	0	0	168
Mask - Locked ²³³	0	0	0	168
Mask - StrokeColor ²³⁴	1	0	0	167
Mask - StrokeDashArray ²³⁵	0	0	0	168
Mask - StrokeWidth ²³⁶	0	0	0	168
Mask - Text ²³⁷	0	0	0	168
Mask - TheC ²³⁸	0	0	0	168
Mask - TheT ²³⁹	0	0	0	168
Mask - TheZ ²⁴⁰	0	0	0	168
Mask - Transform ²⁴¹	0	0	0	168
Mask - Visible ²⁴²	0	0	0	168
Mask - Width ²⁴³	2	0	0	166
Mask - X ²⁴⁴	2	0	0	166
Mask - Y ²⁴⁵	2	0	0	166
MicrobeamManipulation - ExperimenterRef ²⁴⁶	0	0	0	168
MicrobeamManipulation - ID ²⁴⁷	0	0	0	168

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²²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID²²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace²²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#LongAnnotation_Value²²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor²²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule²²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontFamily²²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize²³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Height²³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID²³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_LineCap²³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Locked²³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor²³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray²³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth²³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text²³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC²³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT²⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ²⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform²⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Visible²⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Width²⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_X²⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Y²⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID²⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#MicrobeamManipulation_ID

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
MicrobeamManipulation - ROIRef ²⁴⁸	0	0	0	168
MicrobeamManipulation - Type ²⁴⁹	0	0	0	168
MicrobeamManipulationLightSourceSettings - Attenuation ²⁵⁰	0	0	0	168
MicrobeamManipulationLightSourceSettings - ID ²⁵¹	0	0	0	168
MicrobeamManipulationLightSourceSettings - Wavelength ²⁵²	0	0	0	168
Microscope - Lot-Number ²⁵³	1	0	0	167
Microscope - Manufacturer ²⁵⁴	2	0	0	166
Microscope - Model ²⁵⁵	12	0	0	156
Microscope - Serial-Number ²⁵⁶	4	0	0	164
Microscope - Type ²⁵⁷	3	0	0	165
Objective - CalibratedMagnification ²⁵⁸	9	0	0	159
Objective - Correction ²⁵⁹	26	0	0	142
Objective - ID ²⁶⁰	38	0	0	130
Objective - Immersion ²⁶¹	27	0	0	141
Objective - Iris ²⁶²	2	0	0	166
Objective - LensNA ²⁶³	21	0	0	147
Objective - LotNumber ²⁶⁴	1	0	0	167
Objective - Manufacturer ²⁶⁵	5	0	0	163
Objective - Model ²⁶⁶	14	0	0	154
Objective - Nominal-Magnification ²⁶⁷	29	0	0	139
Objective - Serial-Number ²⁶⁸	3	0	0	165
Continued on next page				

²⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID²⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#MicrobeamManipulation_Type²⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_Attenuation²⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID²⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_Wavelength²⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber²⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer²⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model²⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber²⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Microscope_Type²⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification²⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction²⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID²⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion²⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Iris²⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA²⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber²⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer²⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model²⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification²⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Objective - WorkingDistance ²⁶⁹	10	0	0	158
ObjectiveSettings - CorrectionCollar ²⁷⁰	1	0	0	167
ObjectiveSettings - ID ²⁷¹	33	0	0	135
ObjectiveSettings - Medium ²⁷²	1	0	0	167
ObjectiveSettings - RefractiveIndex ²⁷³	8	0	0	160
Pixels - Annotation-Ref ²⁷⁴	0	0	0	168
Pixels - BigEndian ²⁷⁵	168	0	0	0
Pixels - DimensionOrder ²⁷⁶	168	0	0	0
Pixels - ID ²⁷⁷	168	0	0	0
Pixels - Interleaved ²⁷⁸	168	0	0	0
Pixels - Physical-SizeX ²⁷⁹	88	0	0	80
Pixels - Physical-SizeY ²⁸⁰	88	0	0	80
Pixels - Physical-SizeZ ²⁸¹	44	0	0	124
Pixels - Significant-Bits ²⁸²	168	0	0	0
Pixels - SizeC ²⁸³	168	0	0	0
Pixels - SizeT ²⁸⁴	168	0	0	0
Pixels - SizeX ²⁸⁵	168	0	0	0
Pixels - SizeY ²⁸⁶	168	0	0	0
Pixels - SizeZ ²⁸⁷	168	0	0	0
Pixels - TimeIncrement ²⁸⁸	16	0	0	152
Pixels - Type ²⁸⁹	168	0	0	0
Plane - Annotation-Ref ²⁹⁰	0	0	0	168
Plane - DeltaT ²⁹¹	25	0	0	143
Continued on next page				

²⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance²⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_CorrectionCollar²⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID²⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_Medium²⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex²⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID²⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian²⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder²⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID²⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved²⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX²⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY²⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ²⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits²⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC²⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT²⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX²⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY²⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ²⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement²⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type²⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID²⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Plane - ExposureTime ²⁹²	32	0	0	136
Plane - HashSHA1 ²⁹³	0	0	0	168
Plane - PositionX ²⁹⁴	29	0	0	139
Plane - PositionY ²⁹⁵	29	0	0	139
Plane - PositionZ ²⁹⁶	22	0	0	146
Plane - TheC ²⁹⁷	168	0	0	0
Plane - TheT ²⁹⁸	168	0	0	0
Plane - TheZ ²⁹⁹	168	0	0	0
Plate - AnnotationRef ³⁰⁰	0	0	0	168
Plate - ColumnNamingConvention ³⁰¹	8	0	0	160
Plate - Columns ³⁰²	4	0	0	164
Plate - Description ³⁰³	2	0	0	166
Plate - ExternalIdentifier ³⁰⁴	3	0	0	165
Plate - ID ³⁰⁵	10	0	0	158
Plate - Name ³⁰⁶	9	0	0	159
Plate - RowNamingConvention ³⁰⁷	8	0	0	160
Plate - Rows ³⁰⁸	4	0	0	164
Plate - Status ³⁰⁹	0	0	0	168
Plate - WellOriginX ³¹⁰	1	0	0	167
Plate - WellOriginY ³¹¹	1	0	0	167
PlateAcquisition - AnnotationRef ³¹²	0	0	0	168
PlateAcquisition - Description ³¹³	0	0	0	168
PlateAcquisition - EndTime ³¹⁴	2	0	0	166
PlateAcquisition - ID ³¹⁵	8	0	0	160

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²⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime²⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_HashSHA1²⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX²⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY²⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ²⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC²⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT²⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ³⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID³⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention³⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Columns³⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Description³⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ExternalIdentifier³⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID³⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name³⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention³⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Rows³⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Status³¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_WellOriginX³¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_WellOriginY³¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID³¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_Description³¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_EndTime³¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
PlateAcquisition - MaximumFieldCount ³¹⁶	8	0	0	160
PlateAcquisition - Name ³¹⁷	0	0	0	168
PlateAcquisition - StartTime ³¹⁸	3	0	0	165
PlateAcquisition - WellSampleRef ³¹⁹	7	0	0	161
Point - FillColor ³²⁰	0	0	0	168
Point - FillRule ³²¹	0	0	0	168
Point - FontFamily ³²²	0	0	0	168
Point - FontSize ³²³	1	0	0	167
Point - FontStyle ³²⁴	0	0	0	168
Point - ID ³²⁵	3	0	0	165
Point - LineCap ³²⁶	0	0	0	168
Point - Locked ³²⁷	0	0	0	168
Point - Stroke-Color ³²⁸	1	0	0	167
Point - StrokeDashArray ³²⁹	1	0	0	167
Point - StrokeWidth ³³⁰	2	0	0	166
Point - Text ³³¹	1	0	0	167
Point - TheC ³³²	0	0	0	168
Point - TheT ³³³	1	0	0	167
Point - TheZ ³³⁴	2	0	0	166
Point - Transform ³³⁵	0	0	0	168
Point - Visible ³³⁶	0	0	0	168
Point - X ³³⁷	3	0	0	165
Point - Y ³³⁸	3	0	0	165
Polygon - Fill-Color ³³⁹	0	0	0	168
Polygon - FillRule ³⁴⁰	0	0	0	168

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³¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

³¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_Name

³¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_StartTime

³¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

³²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor

³²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule

³²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontFamily

³²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontStyle

³²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_LineCap

³²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Locked

³²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

³²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray

³³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

³³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC

³³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

³³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Visible

³³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_X

³³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_Y

³³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor

³⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Polygon - FontFamily ³⁴¹	0	0	0	168
Polygon - FontSize ³⁴²	2	0	0	166
Polygon - FontStyle ³⁴³	0	0	0	168
Polygon - ID ³⁴⁴	7	0	0	161
Polygon - LineCap ³⁴⁵	0	0	0	168
Polygon - Locked ³⁴⁶	0	0	0	168
Polygon - Points ³⁴⁷	7	0	0	161
Polygon - StrokeColor ³⁴⁸	1	0	0	167
Polygon - StrokeDashArray ³⁴⁹	1	0	0	167
Polygon - StrokeWidth ³⁵⁰	3	0	0	165
Polygon - Text ³⁵¹	2	0	0	166
Polygon - TheC ³⁵²	0	0	0	168
Polygon - TheT ³⁵³	1	0	0	167
Polygon - TheZ ³⁵⁴	2	0	0	166
Polygon - Transform ³⁵⁵	1	0	0	167
Polygon - Visible ³⁵⁶	0	0	0	168
Polyline - FillColor ³⁵⁷	0	0	0	168
Polyline - FillRule ³⁵⁸	0	0	0	168
Polyline - FontFamily ³⁵⁹	0	0	0	168
Polyline - FontSize ³⁶⁰	2	0	0	166
Polyline - FontStyle ³⁶¹	0	0	0	168
Polyline - ID ³⁶²	5	0	0	163
Polyline - LineCap ³⁶³	0	0	0	168
Polyline - Locked ³⁶⁴	0	0	0	168

Continued on next page

³⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontFamily³⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize³⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontStyle³⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID³⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_LineCap³⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Locked³⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points³⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor³⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray³⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth³⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text³⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC³⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT³⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ³⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform³⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Visible³⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor³⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule³⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontFamily³⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize³⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontStyle³⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID³⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_LineCap³⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Locked

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Polyline - MarkerEnd ³⁶⁵	0	0	0	168
Polyline - MarkerStart ³⁶⁶	0	0	0	168
Polyline - Points ³⁶⁷	5	0	0	163
Polyline - StrokeColor ³⁶⁸	1	0	0	167
Polyline - StrokeDashArray ³⁶⁹	1	0	0	167
Polyline - StrokeWidth ³⁷⁰	3	0	0	165
Polyline - Text ³⁷¹	2	0	0	166
Polyline - TheC ³⁷²	0	0	0	168
Polyline - TheT ³⁷³	1	0	0	167
Polyline - TheZ ³⁷⁴	2	0	0	166
Polyline - Transform ³⁷⁵	1	0	0	167
Polyline - Visible ³⁷⁶	0	0	0	168
Project - AnnotationRef ³⁷⁷	0	0	0	168
Project - DatasetRef ³⁷⁸	0	0	0	168
Project - Description ³⁷⁹	0	0	0	168
Project - ExperimenterGroupRef ³⁸⁰	0	0	0	168
Project - ExperimenterRef ³⁸¹	0	0	0	168
Project - ID ³⁸²	0	0	0	168
Project - Name ³⁸³	0	0	0	168
ROI - AnnotationRef ³⁸⁴	0	0	0	168
ROI - Description ³⁸⁵	1	0	0	167
ROI - ID ³⁸⁶	12	0	0	156
ROI - Name ³⁸⁷	4	0	0	164
ROI - Namespace ³⁸⁸	0	0	0	168
Continued on next page				

³⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polyline_MarkerEnd³⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polyline_MarkerStart³⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polyline_Points³⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor³⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray³⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth³⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text³⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC³⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT³⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ³⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform³⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Visible³⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID³⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DatasetRef_ID³⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Project_Description³⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterGroupRef_ID³⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID³⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Project_ID³⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Project_Name³⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID³⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Description³⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID³⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Name³⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Namespace

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Reagent - AnnotationRef ³⁸⁹	0	0	0	168
Reagent - Description ³⁹⁰	0	0	0	168
Reagent - ID ³⁹¹	0	0	0	168
Reagent - Name ³⁹²	0	0	0	168
Reagent - ReagentIdentifier ³⁹³	0	0	0	168
Rectangle - FillColor ³⁹⁴	0	0	0	168
Rectangle - FillRule ³⁹⁵	0	0	0	168
Rectangle - FontFamily ³⁹⁶	0	0	0	168
Rectangle - FontSize ³⁹⁷	2	0	0	166
Rectangle - FontStyle ³⁹⁸	0	0	0	168
Rectangle - Height ³⁹⁹	8	0	0	160
Rectangle - ID ⁴⁰⁰	8	0	0	160
Rectangle - LineCap ⁴⁰¹	0	0	0	168
Rectangle - Locked ⁴⁰²	0	0	0	168
Rectangle - StrokeColor ⁴⁰³	1	0	0	167
Rectangle - StrokeDashArray ⁴⁰⁴	0	0	0	168
Rectangle - StrokeWidth ⁴⁰⁵	2	0	0	166
Rectangle - Text ⁴⁰⁶	2	0	0	166
Rectangle - TheC ⁴⁰⁷	1	0	0	167
Rectangle - TheT ⁴⁰⁸	2	0	0	166
Rectangle - TheZ ⁴⁰⁹	2	0	0	166
Rectangle - Transform ⁴¹⁰	1	0	0	167
Continued on next page				

³⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID³⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Reagent_Description³⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Reagent_ID³⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Reagent_Name³⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Reagent_ReagentIdentifier³⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor³⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule³⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontFamily³⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize³⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontStyle³⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height⁴⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID⁴⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_LineCap⁴⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Locked⁴⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor⁴⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray⁴⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth⁴⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text⁴⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC⁴⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT⁴⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ⁴¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Rectangle - Visible ⁴¹¹	0	0	0	168
Rectangle - Width ⁴¹²	8	0	0	160
Rectangle - X ⁴¹³	8	0	0	160
Rectangle - Y ⁴¹⁴	8	0	0	160
Screen - Annotation-Ref ⁴¹⁵	0	0	0	168
Screen - Description ⁴¹⁶	0	0	0	168
Screen - ID ⁴¹⁷	1	0	0	167
Screen - Name ⁴¹⁸	1	0	0	167
Screen - PlateRef ⁴¹⁹	1	0	0	167
Screen - ProtocolDescription ⁴²⁰	0	0	0	168
Screen - ProtocolIdentifier ⁴²¹	0	0	0	168
Screen - ReagentSetDescription ⁴²²	0	0	0	168
Screen - ReagentSetIdentifier ⁴²³	0	0	0	168
Screen - Type ⁴²⁴	0	0	0	168
StageLabel - Name ⁴²⁵	3	0	0	165
StageLabel - X ⁴²⁶	2	0	0	166
StageLabel - Y ⁴²⁷	2	0	0	166
StageLabel - Z ⁴²⁸	3	0	0	165
TagAnnotation - AnnotationRef ⁴²⁹	0	0	0	168
TagAnnotation - Description ⁴³⁰	0	0	0	168
TagAnnotation - ID ⁴³¹	1	0	0	167
TagAnnotation - Namespace ⁴³²	1	0	0	167
TagAnnotation - Value ⁴³³	1	0	0	167
Continued on next page				

⁴¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Visible⁴¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width⁴¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X⁴¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y⁴¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID⁴¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Screen_Description⁴¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Screen_ID⁴¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Screen_Name⁴¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Screen_Screen_PlateRef_ID⁴²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Screen_ProtocolDescription⁴²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Screen_ProtocolIdentifier⁴²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Screen_ReagentSetDescription⁴²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Screen_ReagentSetIdentifier⁴²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Screen_Type⁴²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Name⁴²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_X⁴²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Y⁴²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Z⁴²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID⁴³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Description⁴³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID⁴³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace⁴³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#TagAnnotation_Value

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
TermAnnotation - AnnotationRef ⁴³⁴	0	0	0	168
TermAnnotation - Description ⁴³⁵	0	0	0	168
TermAnnotation - ID ⁴³⁶	1	0	0	167
TermAnnotation - Namespace ⁴³⁷	1	0	0	167
TermAnnotation - Value ⁴³⁸	1	0	0	167
TiffData - FirstC ⁴³⁹	0	0	0	168
TiffData - FirstT ⁴⁴⁰	0	0	0	168
TiffData - FirstZ ⁴⁴¹	0	0	0	168
TiffData - IFD ⁴⁴²	0	0	0	168
TiffData - PlaneCount ⁴⁴³	0	0	0	168
TimestampAnnotation - AnnotationRef ⁴⁴⁴	0	0	0	168
TimestampAnnotation - Description ⁴⁴⁵	0	0	0	168
TimestampAnnotation - ID ⁴⁴⁶	1	0	0	167
TimestampAnnotation - Namespace ⁴⁴⁷	1	0	0	167
TimestampAnnotation - Value ⁴⁴⁸	1	0	0	167
TransmittanceRange - CutIn ⁴⁴⁹	5	0	0	163
TransmittanceRange - CutInTolerance ⁴⁵⁰	1	0	0	167
TransmittanceRange - CutOut ⁴⁵¹	5	0	0	163
TransmittanceRange - CutOutTolerance ⁴⁵²	1	0	0	167
TransmittanceRange - Transmittance ⁴⁵³	1	0	0	167
UUID - FileName ⁴⁵⁴	0	0	0	168
UUID - Value ⁴⁵⁵	0	0	0	168
Continued on next page				

⁴³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID⁴³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Description⁴³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID⁴³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace⁴³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#TermAnnotation_Value⁴³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TiffData_FirstC⁴⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TiffData_FirstT⁴⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TiffData_FirstZ⁴⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TiffData_IFD⁴⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TiffData_PlaneCount⁴⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID⁴⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Description⁴⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID⁴⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace⁴⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#TimestampAnnotation_Value⁴⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn⁴⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutInTolerance⁴⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut⁴⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOutTolerance⁴⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_Transmittance⁴⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TiffData_TiffData_UUID_FileName⁴⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#UniversallyUniqueIdentifier

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Well - Annotation-Ref ⁴⁵⁶	0	0	0	168
Well - Color ⁴⁵⁷	0	0	0	168
Well - Column ⁴⁵⁸	11	0	0	157
Well - ExternalDescription ⁴⁵⁹	0	0	0	168
Well - ExternalIdentifier ⁴⁶⁰	0	0	0	168
Well - ID ⁴⁶¹	11	0	0	157
Well - ReagentRef ⁴⁶²	0	0	0	168
Well - Row ⁴⁶³	11	0	0	157
Well - Type ⁴⁶⁴	0	0	0	168
WellSample - AnnotationRef ⁴⁶⁵	0	0	0	168
WellSample - ID ⁴⁶⁶	11	0	0	157
WellSample - ImageRef ⁴⁶⁷	10	0	0	158
WellSample - Index ⁴⁶⁸	11	0	0	157
WellSample - PositionX ⁴⁶⁹	5	0	0	163
WellSample - PositionY ⁴⁷⁰	5	0	0	163
WellSample - Time-point ⁴⁷¹	0	0	0	168
XMLAnnotation - AnnotationRef ⁴⁷²	0	0	0	168
XMLAnnotation - ID ⁴⁷³	1	0	0	167
XMLAnnotation - Namespace ⁴⁷⁴	1	0	0	167
XMLAnnotation - Value ⁴⁷⁵	1	0	0	167

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁷⁶ or the previous versions⁴⁷⁷ page to find documentation for the version you are using.

⁴⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID

⁴⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Color

⁴⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

⁴⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ExternalDescription

⁴⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ExternalIdentifier

⁴⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

⁴⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#ReagentRef_ID

⁴⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

⁴⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Type

⁴⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID

⁴⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

⁴⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

⁴⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

⁴⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

⁴⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

⁴⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Timepoint

⁴⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID

⁴⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID

⁴⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace

⁴⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#XMLAnnotation_Value

⁴⁷⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷⁷<http://www.openmicroscopy.org/site/support/legacy/>

18.2.1 SlidebookReader

This page lists supported metadata fields for the Bio-Formats Olympus Slidebook format reader.

These fields are from the [OME data model](#)⁴⁷⁸. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 34 of them (7%).
- Of those, Bio-Formats fully or partially converts 34 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Olympus Slidebook format reader:

- Channel : ID⁴⁷⁹
- Channel : NDFilter⁴⁸⁰
- Channel : Name⁴⁸¹
- Channel : SamplesPerPixel⁴⁸²
- Image : AcquisitionDate⁴⁸³
- Image : Description⁴⁸⁴
- Image : ID⁴⁸⁵
- Image : InstrumentRef⁴⁸⁶
- Image : Name⁴⁸⁷
- Instrument : ID⁴⁸⁸
- Objective : Correction⁴⁸⁹
- Objective : ID⁴⁹⁰
- Objective : Immersion⁴⁹¹
- Objective : Model⁴⁹²
- Objective : NominalMagnification⁴⁹³
- ObjectiveSettings : ID⁴⁹⁴
- Pixels : BigEndian⁴⁹⁵
- Pixels : DimensionOrder⁴⁹⁶

⁴⁷⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_NDFilter

⁴⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁴⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁴⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁴⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁴⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁴⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁴⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID⁴⁹⁷
- Pixels : Interleaved⁴⁹⁸
- Pixels : PhysicalSizeX⁴⁹⁹
- Pixels : PhysicalSizeY⁵⁰⁰
- Pixels : PhysicalSizeZ⁵⁰¹
- Pixels : SignificantBits⁵⁰²
- Pixels : SizeC⁵⁰³
- Pixels : SizeT⁵⁰⁴
- Pixels : SizeX⁵⁰⁵
- Pixels : SizeY⁵⁰⁶
- Pixels : SizeZ⁵⁰⁷
- Pixels : Type⁵⁰⁸
- Plane : ExposureTime⁵⁰⁹
- Plane : TheC⁵¹⁰
- Plane : TheT⁵¹¹
- Plane : TheZ⁵¹²

Total supported: 34

Total unknown or missing: 441

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁵¹³ or the previous versions⁵¹⁴ page to find documentation for the version you are using.

18.2.2 SlideBook6Reader

This page lists supported metadata fields for the Bio-Formats SlideBook 6 SLD (native) format reader.

These fields are from the OME data model⁵¹⁵. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 37 of them (7%).
- Of those, Bio-Formats fully or partially converts 37 (100%).

⁴⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁵⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁵⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁵⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁵⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁵⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁵⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁵⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁵⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁵⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁵⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

⁵¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁵¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁵¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁵¹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵¹⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁵¹⁵<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats SlideBook 6 SLD (native) format reader:

- Channel : ID⁵¹⁶
- Channel : Name⁵¹⁷
- Channel : SamplesPerPixel⁵¹⁸
- Image : AcquisitionDate⁵¹⁹
- Image : Description⁵²⁰
- Image : ID⁵²¹
- Image : InstrumentRef⁵²²
- Image : Name⁵²³
- Instrument : ID⁵²⁴
- Objective : Correction⁵²⁵
- Objective : ID⁵²⁶
- Objective : Immersion⁵²⁷
- Objective : Model⁵²⁸
- Objective : NominalMagnification⁵²⁹
- ObjectiveSettings : ID⁵³⁰
- Pixels : BigEndian⁵³¹
- Pixels : DimensionOrder⁵³²
- Pixels : ID⁵³³
- Pixels : Interleaved⁵³⁴
- Pixels : PhysicalSizeX⁵³⁵
- Pixels : PhysicalSizeY⁵³⁶
- Pixels : PhysicalSizeZ⁵³⁷
- Pixels : SignificantBits⁵³⁸
- Pixels : SizeC⁵³⁹

⁵¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁵¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁵¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁵¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁵²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁵²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁵²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁵²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁵²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁵²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁵²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁵²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁵²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁵²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁵³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁵³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁵³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁵³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁵³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁵³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁵³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁵³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁵³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁵³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT⁵⁴⁰
- Pixels : SizeX⁵⁴¹
- Pixels : SizeY⁵⁴²
- Pixels : SizeZ⁵⁴³
- Pixels : Type⁵⁴⁴
- Plane : DeltaT⁵⁴⁵
- Plane : ExposureTime⁵⁴⁶
- Plane : PositionX⁵⁴⁷
- Plane : PositionY⁵⁴⁸
- Plane : PositionZ⁵⁴⁹
- Plane : TheC⁵⁵⁰
- Plane : TheT⁵⁵¹
- Plane : TheZ⁵⁵²

Total supported: 37

Total unknown or missing: 438

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version⁵⁵³](#) or the [previous versions⁵⁵⁴](#) page to find documentation for the version you are using.

18.2.3 AIMReader

This page lists supported metadata fields for the Bio-Formats AIM format reader.

These fields are from the [OME data model⁵⁵⁵](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats AIM format reader:

- Channel : ID⁵⁵⁶

⁵⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁵⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁵⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁵⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁵⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁵⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁵⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

⁵⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

⁵⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

⁵⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

⁵⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁵⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁵⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁵⁵³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁵⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁵⁵<http://www.openmicroscopy.org/site/support/ome-model/>

⁵⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

- Channel : SamplesPerPixel⁵⁵⁷
- Image : AcquisitionDate⁵⁵⁸
- Image : ID⁵⁵⁹
- Image : Name⁵⁶⁰
- Pixels : BigEndian⁵⁶¹
- Pixels : DimensionOrder⁵⁶²
- Pixels : ID⁵⁶³
- Pixels : Interleaved⁵⁶⁴
- Pixels : PhysicalSizeX⁵⁶⁵
- Pixels : PhysicalSizeY⁵⁶⁶
- Pixels : PhysicalSizeZ⁵⁶⁷
- Pixels : SignificantBits⁵⁶⁸
- Pixels : SizeC⁵⁶⁹
- Pixels : SizeT⁵⁷⁰
- Pixels : SizeX⁵⁷¹
- Pixels : SizeY⁵⁷²
- Pixels : SizeZ⁵⁷³
- Pixels : Type⁵⁷⁴
- Plane : TheC⁵⁷⁵
- Plane : TheT⁵⁷⁶
- Plane : TheZ⁵⁷⁷

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁵⁷⁸ or the previous versions⁵⁷⁹ page to find documentation for the version you are using.

⁵⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁵⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁵⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁵⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁵⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁵⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁵⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁵⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁵⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁵⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁵⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁵⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁵⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁵⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁵⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁵⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁵⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁵⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁵⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁵⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁵⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁵⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.4 AliconaReader

This page lists supported metadata fields for the Bio-Formats Alicona AL3D format reader.

These fields are from the [OME data model](#)⁵⁸⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 33 of them (6%).
- Of those, Bio-Formats fully or partially converts 33 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Alicona AL3D format reader:

- Channel : ID⁵⁸¹
- Channel : SamplesPerPixel⁵⁸²
- Detector : ID⁵⁸³
- Detector : Type⁵⁸⁴
- DetectorSettings : ID⁵⁸⁵
- DetectorSettings : Voltage⁵⁸⁶
- Image : AcquisitionDate⁵⁸⁷
- Image : ID⁵⁸⁸
- Image : InstrumentRef⁵⁸⁹
- Image : Name⁵⁹⁰
- Instrument : ID⁵⁹¹
- Objective : CalibratedMagnification⁵⁹²
- Objective : Correction⁵⁹³
- Objective : ID⁵⁹⁴
- Objective : Immersion⁵⁹⁵
- Objective : WorkingDistance⁵⁹⁶
- ObjectiveSettings : ID⁵⁹⁷
- Pixels : BigEndian⁵⁹⁸

⁵⁸⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁵⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁵⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁵⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁵⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁵⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁵⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

⁵⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁵⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁵⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁵⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁵⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁵⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

⁵⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁵⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁵⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁵⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

⁵⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁵⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

- Pixels : DimensionOrder⁵⁹⁹
- Pixels : ID⁶⁰⁰
- Pixels : Interleaved⁶⁰¹
- Pixels : PhysicalSizeX⁶⁰²
- Pixels : PhysicalSizeY⁶⁰³
- Pixels : SignificantBits⁶⁰⁴
- Pixels : SizeC⁶⁰⁵
- Pixels : SizeT⁶⁰⁶
- Pixels : SizeX⁶⁰⁷
- Pixels : SizeY⁶⁰⁸
- Pixels : SizeZ⁶⁰⁹
- Pixels : Type⁶¹⁰
- Plane : TheC⁶¹¹
- Plane : TheT⁶¹²
- Plane : TheZ⁶¹³

Total supported: 33

Total unknown or missing: 442

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version⁶¹⁴](#) or the [previous versions⁶¹⁵](#) page to find documentation for the version you are using.

18.2.5 GelReader

This page lists supported metadata fields for the Bio-Formats Amersham Biosciences GEL format reader.

These fields are from the [OME data model⁶¹⁶](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 21 of them (4%).
- Of those, Bio-Formats fully or partially converts 21 (100%).

⁵⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁶⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁶⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁶⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁶⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁶⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁶⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁶⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁶⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁶⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁶⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁶¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁶¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁶¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁶¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁶¹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶¹⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁶¹⁶<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Amersham Biosciences GEL format reader:

- Channel : ID⁶¹⁷
- Channel : SamplesPerPixel⁶¹⁸
- Image : AcquisitionDate⁶¹⁹
- Image : ID⁶²⁰
- Image : Name⁶²¹
- Pixels : BigEndian⁶²²
- Pixels : DimensionOrder⁶²³
- Pixels : ID⁶²⁴
- Pixels : Interleaved⁶²⁵
- Pixels : PhysicalSizeX⁶²⁶
- Pixels : PhysicalSizeY⁶²⁷
- Pixels : SignificantBits⁶²⁸
- Pixels : SizeC⁶²⁹
- Pixels : SizeT⁶³⁰
- Pixels : SizeX⁶³¹
- Pixels : SizeY⁶³²
- Pixels : SizeZ⁶³³
- Pixels : Type⁶³⁴
- Plane : TheC⁶³⁵
- Plane : TheT⁶³⁶
- Plane : TheZ⁶³⁷

Total supported: 21

Total unknown or missing: 454

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁶³⁸ or the previous versions⁶³⁹ page to find documentation for the version you are using.

⁶¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁶¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁶¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁶²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁶²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁶²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁶²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁶²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁶²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁶²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁶²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁶²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁶²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁶³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁶³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁶³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁶³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁶³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁶³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁶³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁶³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁶³⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶³⁹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.6 AmiraReader

This page lists supported metadata fields for the Bio-Formats Amira format reader.

These fields are from the [OME data model](#)⁶⁴⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Amira format reader:

- Channel : ID⁶⁴¹
- Channel : SamplesPerPixel⁶⁴²
- Image : AcquisitionDate⁶⁴³
- Image : ID⁶⁴⁴
- Image : Name⁶⁴⁵
- Pixels : BigEndian⁶⁴⁶
- Pixels : DimensionOrder⁶⁴⁷
- Pixels : ID⁶⁴⁸
- Pixels : Interleaved⁶⁴⁹
- Pixels : PhysicalSizeX⁶⁵⁰
- Pixels : PhysicalSizeY⁶⁵¹
- Pixels : PhysicalSizeZ⁶⁵²
- Pixels : SignificantBits⁶⁵³
- Pixels : SizeC⁶⁵⁴
- Pixels : SizeT⁶⁵⁵
- Pixels : SizeX⁶⁵⁶
- Pixels : SizeY⁶⁵⁷
- Pixels : SizeZ⁶⁵⁸
- Pixels : Type⁶⁵⁹

⁶⁴⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁶⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁶⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁶⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁶⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁶⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁶⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁶⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁶⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁶⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁶⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁶⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁶⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁶⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁶⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁶⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁶⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁶⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁶⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁶⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC⁶⁶⁰
- Plane : TheT⁶⁶¹
- Plane : TheZ⁶⁶²

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version⁶⁶³](#) or the [previous versions⁶⁶⁴](#) page to find documentation for the version you are using.

18.2.7 FlowSightReader

This page lists supported metadata fields for the Bio-Formats FlowSight format reader.

These fields are from the [OME data model⁶⁶⁵](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 20 of them (4%).
- Of those, Bio-Formats fully or partially converts 20 (100%).

Supported fields

These fields are fully supported by the Bio-Formats FlowSight format reader:

- Channel : ID⁶⁶⁶
- Channel : Name⁶⁶⁷
- Channel : SamplesPerPixel⁶⁶⁸
- Image : AcquisitionDate⁶⁶⁹
- Image : ID⁶⁷⁰
- Image : Name⁶⁷¹
- Pixels : BigEndian⁶⁷²
- Pixels : DimensionOrder⁶⁷³
- Pixels : ID⁶⁷⁴
- Pixels : Interleaved⁶⁷⁵
- Pixels : SignificantBits⁶⁷⁶

⁶⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁶⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁶⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁶⁶³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁶⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁶⁵<http://www.openmicroscopy.org/site/support/ome-model/>

⁶⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁶⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁶⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁶⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁶⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁶⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁶⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁶⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁶⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁶⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁶⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

- Pixels : SizeC⁶⁷⁷
- Pixels : SizeT⁶⁷⁸
- Pixels : SizeX⁶⁷⁹
- Pixels : SizeY⁶⁸⁰
- Pixels : SizeZ⁶⁸¹
- Pixels : Type⁶⁸²
- Plane : TheC⁶⁸³
- Plane : TheT⁶⁸⁴
- Plane : TheZ⁶⁸⁵

Total supported: 20

Total unknown or missing: 455

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁶⁸⁶](#) or the [previous versions⁶⁸⁷](#) page to find documentation for the version you are using.

18.2.8 AnalyzeReader

This page lists supported metadata fields for the Bio-Formats Analyze 7.5 format reader.

These fields are from the [OME data model⁶⁸⁸](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 24 of them (5%).
- Of those, Bio-Formats fully or partially converts 24 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Analyze 7.5 format reader:

- Channel : ID⁶⁸⁹
- Channel : SamplesPerPixel⁶⁹⁰
- Image : AcquisitionDate⁶⁹¹
- Image : Description⁶⁹²
- Image : ID⁶⁹³

⁶⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁶⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁶⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁶⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁶⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁶⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁶⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁶⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁶⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁶⁸⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁸⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁸⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁶⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁶⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁶⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁶⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁶⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name⁶⁹⁴
- Pixels : BigEndian⁶⁹⁵
- Pixels : DimensionOrder⁶⁹⁶
- Pixels : ID⁶⁹⁷
- Pixels : Interleaved⁶⁹⁸
- Pixels : PhysicalSizeX⁶⁹⁹
- Pixels : PhysicalSizeY⁷⁰⁰
- Pixels : PhysicalSizeZ⁷⁰¹
- Pixels : SignificantBits⁷⁰²
- Pixels : SizeC⁷⁰³
- Pixels : SizeT⁷⁰⁴
- Pixels : SizeX⁷⁰⁵
- Pixels : SizeY⁷⁰⁶
- Pixels : SizeZ⁷⁰⁷
- Pixels : TimeIncrement⁷⁰⁸
- Pixels : Type⁷⁰⁹
- Plane : TheC⁷¹⁰
- Plane : TheT⁷¹¹
- Plane : TheZ⁷¹²

Total supported: 24

Total unknown or missing: 451

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁷¹³ or the previous versions⁷¹⁴ page to find documentation for the version you are using.

18.2.9 AFIRReader

This page lists supported metadata fields for the Bio-Formats Aperio AFI format reader.

- ⁶⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ⁶⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ⁶⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ⁶⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁶⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁶⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ⁷⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ⁷⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ
- ⁷⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁷⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁷⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁷⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁷⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁷⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁷⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement
- ⁷⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁷¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁷¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁷¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁷¹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁷¹⁴<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)⁷¹⁵. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 30 of them (6%).
- Of those, Bio-Formats fully or partially converts 30 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Aperio AFI format reader:

- Channel : EmissionWavelength⁷¹⁶
- Channel : ExcitationWavelength⁷¹⁷
- Channel : ID⁷¹⁸
- Channel : Name⁷¹⁹
- Channel : SamplesPerPixel⁷²⁰
- Image : AcquisitionDate⁷²¹
- Image : ID⁷²²
- Image : InstrumentRef⁷²³
- Image : Name⁷²⁴
- Instrument : ID⁷²⁵
- Objective : ID⁷²⁶
- Objective : NominalMagnification⁷²⁷
- ObjectiveSettings : ID⁷²⁸
- Pixels : BigEndian⁷²⁹
- Pixels : DimensionOrder⁷³⁰
- Pixels : ID⁷³¹
- Pixels : Interleaved⁷³²
- Pixels : PhysicalSizeX⁷³³
- Pixels : PhysicalSizeY⁷³⁴
- Pixels : SignificantBits⁷³⁵

⁷¹⁵<http://www.openmicroscopy.org/site/support/ome-model/>

⁷¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁷¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

⁷¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁷¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁷²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁷²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁷²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁷²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁷²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁷²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁷²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁷²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁷²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁷²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁷³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁷³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁷³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁷³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁷³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁷³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

- Pixels : SizeC⁷³⁶
- Pixels : SizeT⁷³⁷
- Pixels : SizeX⁷³⁸
- Pixels : SizeY⁷³⁹
- Pixels : SizeZ⁷⁴⁰
- Pixels : Type⁷⁴¹
- Plane : ExposureTime⁷⁴²
- Plane : TheC⁷⁴³
- Plane : TheT⁷⁴⁴
- Plane : TheZ⁷⁴⁵

Total supported: 30

Total unknown or missing: 445

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁷⁴⁶ or the previous versions⁷⁴⁷ page to find documentation for the version you are using.

18.2.10 SVSReader

This page lists supported metadata fields for the Bio-Formats Aperio SVS format reader.

These fields are from the OME data model⁷⁴⁸. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 29 of them (6%).
- Of those, Bio-Formats fully or partially converts 29 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Aperio SVS format reader:

- Channel : EmissionWavelength⁷⁴⁹
- Channel : ExcitationWavelength⁷⁵⁰
- Channel : ID⁷⁵¹
- Channel : SamplesPerPixel⁷⁵²

⁷³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁷³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁷³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁷³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁷⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁷⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁷⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

⁷⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁷⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁷⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁷⁴⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁴⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁴⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁷⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁷⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

⁷⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁷⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

- Image : AcquisitionDate⁷⁵³
- Image : Description⁷⁵⁴
- Image : ID⁷⁵⁵
- Image : InstrumentRef⁷⁵⁶
- Image : Name⁷⁵⁷
- Instrument : ID⁷⁵⁸
- Objective : ID⁷⁵⁹
- Objective : NominalMagnification⁷⁶⁰
- ObjectiveSettings : ID⁷⁶¹
- Pixels : BigEndian⁷⁶²
- Pixels : DimensionOrder⁷⁶³
- Pixels : ID⁷⁶⁴
- Pixels : Interleaved⁷⁶⁵
- Pixels : PhysicalSizeX⁷⁶⁶
- Pixels : PhysicalSizeY⁷⁶⁷
- Pixels : SignificantBits⁷⁶⁸
- Pixels : SizeC⁷⁶⁹
- Pixels : SizeT⁷⁷⁰
- Pixels : SizeX⁷⁷¹
- Pixels : SizeY⁷⁷²
- Pixels : SizeZ⁷⁷³
- Pixels : Type⁷⁷⁴
- Plane : TheC⁷⁷⁵
- Plane : TheT⁷⁷⁶
- Plane : TheZ⁷⁷⁷

⁷⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁷⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁷⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁷⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁷⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁷⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁷⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁷⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁷⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁷⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁷⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁷⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁷⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁷⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁷⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁷⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁷⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁷⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁷⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁷⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁷⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁷⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁷⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁷⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁷⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

Total supported: 29

Total unknown or missing: 446

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁷⁷⁸ or the previous versions⁷⁷⁹ page to find documentation for the version you are using.

18.2.11 CellWorxReader

This page lists supported metadata fields for the Bio-Formats CellWorx format reader.

These fields are from the OME data model⁷⁸⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 45 of them (9%).
- Of those, Bio-Formats fully or partially converts 45 (100%).

Supported fields

These fields are fully supported by the Bio-Formats CellWorx format reader:

- Channel : EmissionWavelength⁷⁸¹
- Channel : ExcitationWavelength⁷⁸²
- Channel : ID⁷⁸³
- Channel : Name⁷⁸⁴
- Channel : SamplesPerPixel⁷⁸⁵
- Detector : ID⁷⁸⁶
- DetectorSettings : Gain⁷⁸⁷
- DetectorSettings : ID⁷⁸⁸
- Image : AcquisitionDate⁷⁸⁹
- Image : ID⁷⁹⁰
- Image : InstrumentRef⁷⁹¹
- Image : Name⁷⁹²
- Instrument : ID⁷⁹³
- Microscope : SerialNumber⁷⁹⁴

⁷⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁸⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁷⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁷⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

⁷⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁷⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁷⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁷⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁷⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁷⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁷⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁷⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁷⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁷⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁷⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁷⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

- Pixels : BigEndian⁷⁹⁵
- Pixels : DimensionOrder⁷⁹⁶
- Pixels : ID⁷⁹⁷
- Pixels : Interleaved⁷⁹⁸
- Pixels : PhysicalSizeX⁷⁹⁹
- Pixels : PhysicalSizeY⁸⁰⁰
- Pixels : SignificantBits⁸⁰¹
- Pixels : SizeC⁸⁰²
- Pixels : SizeT⁸⁰³
- Pixels : SizeX⁸⁰⁴
- Pixels : SizeY⁸⁰⁵
- Pixels : SizeZ⁸⁰⁶
- Pixels : Type⁸⁰⁷
- Plane : TheC⁸⁰⁸
- Plane : TheT⁸⁰⁹
- Plane : TheZ⁸¹⁰
- Plate : ID⁸¹¹
- Plate : Name⁸¹²
- PlateAcquisition : EndTime⁸¹³
- PlateAcquisition : ID⁸¹⁴
- PlateAcquisition : MaximumFieldCount⁸¹⁵
- PlateAcquisition : StartTime⁸¹⁶
- PlateAcquisition : WellSampleRef⁸¹⁷
- Well : Column⁸¹⁸
- Well : ID⁸¹⁹
- Well : Row⁸²⁰

⁷⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁷⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁷⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁷⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁷⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁸⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁸⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁸⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁸⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁸⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁸⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁸⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁸⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁸⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁸⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁸¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁸¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

⁸¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

⁸¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_EndTime

⁸¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

⁸¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

⁸¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_StartTime

⁸¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

⁸¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

⁸¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

⁸²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

- WellSample : ID⁸²¹
- WellSample : ImageRef⁸²²
- WellSample : Index⁸²³
- WellSample : PositionX⁸²⁴
- WellSample : PositionY⁸²⁵

Total supported: 45

Total unknown or missing: 430

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁸²⁶](#) or the [previous versions⁸²⁷](#) page to find documentation for the version you are using.

18.2.12 AVIReader

This page lists supported metadata fields for the Bio-Formats Audio Video Interleave format reader.

These fields are from the [OME data model⁸²⁸](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Audio Video Interleave format reader:

- Channel : ID⁸²⁹
- Channel : SamplesPerPixel⁸³⁰
- Image : AcquisitionDate⁸³¹
- Image : ID⁸³²
- Image : Name⁸³³
- Pixels : BigEndian⁸³⁴
- Pixels : DimensionOrder⁸³⁵
- Pixels : ID⁸³⁶
- Pixels : Interleaved⁸³⁷

⁸²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

⁸²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

⁸²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

⁸²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

⁸²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

⁸²⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸²⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁸²⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁸²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁸³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁸³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁸³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁸³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁸³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁸³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁸³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁸³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

- Pixels : SignificantBits⁸³⁸
- Pixels : SizeC⁸³⁹
- Pixels : SizeT⁸⁴⁰
- Pixels : SizeX⁸⁴¹
- Pixels : SizeY⁸⁴²
- Pixels : SizeZ⁸⁴³
- Pixels : Type⁸⁴⁴
- Plane : TheC⁸⁴⁵
- Plane : TheT⁸⁴⁶
- Plane : TheZ⁸⁴⁷

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁸⁴⁸](#) or the [previous versions⁸⁴⁹](#) page to find documentation for the version you are using.

18.2.13 ARFReader

This page lists supported metadata fields for the Bio-Formats ARF format reader.

These fields are from the [OME data model⁸⁵⁰](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats ARF format reader:

- Channel : ID⁸⁵¹
- Channel : SamplesPerPixel⁸⁵²
- Image : AcquisitionDate⁸⁵³
- Image : ID⁸⁵⁴

⁸³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁸³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁸⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁸⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁸⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁸⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁸⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁸⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁸⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁸⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁸⁴⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸⁴⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁸⁵⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁸⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁸⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁸⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁸⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name⁸⁵⁵
- Pixels : BigEndian⁸⁵⁶
- Pixels : DimensionOrder⁸⁵⁷
- Pixels : ID⁸⁵⁸
- Pixels : Interleaved⁸⁵⁹
- Pixels : SignificantBits⁸⁶⁰
- Pixels : SizeC⁸⁶¹
- Pixels : SizeT⁸⁶²
- Pixels : SizeX⁸⁶³
- Pixels : SizeY⁸⁶⁴
- Pixels : SizeZ⁸⁶⁵
- Pixels : Type⁸⁶⁶
- Plane : TheC⁸⁶⁷
- Plane : TheT⁸⁶⁸
- Plane : TheZ⁸⁶⁹

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁸⁷⁰ or the previous versions⁸⁷¹ page to find documentation for the version you are using.

18.2.14 BDReader

This page lists supported metadata fields for the Bio-Formats BD Pathway format reader.

These fields are from the [OME data model](#)⁸⁷². Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 57 of them (12%).
- Of those, Bio-Formats fully or partially converts 57 (100%).

⁸⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁸⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁸⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁸⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁸⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁸⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁸⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁸⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁸⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁸⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁸⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁸⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁸⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁸⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁸⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁸⁷⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸⁷¹<http://www.openmicroscopy.org/site/support/legacy/>

⁸⁷²<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats BD Pathway format reader:

- Channel : EmissionWavelength⁸⁷³
- Channel : ExcitationWavelength⁸⁷⁴
- Channel : ID⁸⁷⁵
- Channel : Name⁸⁷⁶
- Channel : SamplesPerPixel⁸⁷⁷
- Detector : ID⁸⁷⁸
- DetectorSettings : Binning⁸⁷⁹
- DetectorSettings : Gain⁸⁸⁰
- DetectorSettings : ID⁸⁸¹
- DetectorSettings : Offset⁸⁸²
- Image : AcquisitionDate⁸⁸³
- Image : ID⁸⁸⁴
- Image : InstrumentRef⁸⁸⁵
- Image : Name⁸⁸⁶
- Image : ROIRef⁸⁸⁷
- Instrument : ID⁸⁸⁸
- Objective : ID⁸⁸⁹
- Objective : LensNA⁸⁹⁰
- Objective : Manufacturer⁸⁹¹
- Objective : NominalMagnification⁸⁹²
- ObjectiveSettings : ID⁸⁹³
- Pixels : BigEndian⁸⁹⁴
- Pixels : DimensionOrder⁸⁹⁵
- Pixels : ID⁸⁹⁶

⁸⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁸⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

⁸⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁸⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁸⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁸⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁸⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁸⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁸⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁸⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

⁸⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁸⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁸⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁸⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁸⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

⁸⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁸⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁸⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

⁸⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁸⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁸⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁸⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁸⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁸⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

- Pixels : Interleaved⁸⁹⁷
- Pixels : SignificantBits⁸⁹⁸
- Pixels : SizeC⁸⁹⁹
- Pixels : SizeT⁹⁰⁰
- Pixels : SizeX⁹⁰¹
- Pixels : SizeY⁹⁰²
- Pixels : SizeZ⁹⁰³
- Pixels : Type⁹⁰⁴
- Plane : DeltaT⁹⁰⁵
- Plane : ExposureTime⁹⁰⁶
- Plane : TheC⁹⁰⁷
- Plane : TheT⁹⁰⁸
- Plane : TheZ⁹⁰⁹
- Plate : ColumnNamingConvention⁹¹⁰
- Plate : Description⁹¹¹
- Plate : ID⁹¹²
- Plate : Name⁹¹³
- Plate : RowNamingConvention⁹¹⁴
- PlateAcquisition : ID⁹¹⁵
- PlateAcquisition : MaximumFieldCount⁹¹⁶
- PlateAcquisition : WellSampleRef⁹¹⁷
- ROI : ID⁹¹⁸
- Rectangle : Height⁹¹⁹
- Rectangle : ID⁹²⁰
- Rectangle : Width⁹²¹
- Rectangle : X⁹²²

⁸⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁸⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁸⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

⁹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

⁹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Description

⁹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

⁹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

⁹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

⁹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

⁹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

⁹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

⁹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

⁹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

⁹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

⁹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

- Rectangle : Y⁹²³
- Well : Column⁹²⁴
- Well : ID⁹²⁵
- Well : Row⁹²⁶
- WellSample : ID⁹²⁷
- WellSample : ImageRef⁹²⁸
- WellSample : Index⁹²⁹

Total supported: 57

Total unknown or missing: 418

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁹³⁰](#) or the [previous versions⁹³¹](#) page to find documentation for the version you are using.

18.2.15 SDTReader

This page lists supported metadata fields for the Bio-Formats SPCImage Data format reader.

These fields are from the [OME data model⁹³²](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats SPCImage Data format reader:

- Channel : ID⁹³³
- Channel : SamplesPerPixel⁹³⁴
- Image : AcquisitionDate⁹³⁵
- Image : ID⁹³⁶
- Image : Name⁹³⁷
- Pixels : BigEndian⁹³⁸
- Pixels : DimensionOrder⁹³⁹

⁹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

⁹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

⁹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

⁹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

⁹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

⁹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

⁹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

⁹³⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹³¹<http://www.openmicroscopy.org/site/support/legacy/>

⁹³²<http://www.openmicroscopy.org/site/support/ome-model/>

⁹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID⁹⁴⁰
- Pixels : Interleaved⁹⁴¹
- Pixels : SignificantBits⁹⁴²
- Pixels : SizeC⁹⁴³
- Pixels : SizeT⁹⁴⁴
- Pixels : SizeX⁹⁴⁵
- Pixels : SizeY⁹⁴⁶
- Pixels : SizeZ⁹⁴⁷
- Pixels : Type⁹⁴⁸
- Plane : TheC⁹⁴⁹
- Plane : TheT⁹⁵⁰
- Plane : TheZ⁹⁵¹

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁹⁵² or the previous versions⁹⁵³ page to find documentation for the version you are using.

18.2.16 BioRadGelReader

This page lists supported metadata fields for the Bio-Formats Bio-Rad GEL format reader.

These fields are from the OME data model⁹⁵⁴. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 21 of them (4%).
- Of those, Bio-Formats fully or partially converts 21 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Bio-Rad GEL format reader:

- Channel : ID⁹⁵⁵
- Channel : SamplesPerPixel⁹⁵⁶

⁹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁹⁵²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹⁵³<http://www.openmicroscopy.org/site/support/legacy/>

⁹⁵⁴<http://www.openmicroscopy.org/site/support/ome-model/>

⁹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

- Image : AcquisitionDate⁹⁵⁷
- Image : ID⁹⁵⁸
- Image : Name⁹⁵⁹
- Pixels : BigEndian⁹⁶⁰
- Pixels : DimensionOrder⁹⁶¹
- Pixels : ID⁹⁶²
- Pixels : Interleaved⁹⁶³
- Pixels : PhysicalSizeX⁹⁶⁴
- Pixels : PhysicalSizeY⁹⁶⁵
- Pixels : SignificantBits⁹⁶⁶
- Pixels : SizeC⁹⁶⁷
- Pixels : SizeT⁹⁶⁸
- Pixels : SizeX⁹⁶⁹
- Pixels : SizeY⁹⁷⁰
- Pixels : SizeZ⁹⁷¹
- Pixels : Type⁹⁷²
- Plane : TheC⁹⁷³
- Plane : TheT⁹⁷⁴
- Plane : TheZ⁹⁷⁵

Total supported: 21

Total unknown or missing: 454

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁹⁷⁶ or the previous versions⁹⁷⁷ page to find documentation for the version you are using.

18.2.17 BioRadReader

This page lists supported metadata fields for the Bio-Formats Bio-Rad PIC format reader.

- ⁹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate
- ⁹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ⁹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ⁹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ⁹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ⁹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ⁹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ⁹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁹⁷⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁹⁷⁷<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)⁹⁷⁸. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 40 of them (8%).
- Of those, Bio-Formats fully or partially converts 40 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Bio-Rad PIC format reader:

- Channel : ID⁹⁷⁹
- Channel : SamplesPerPixel⁹⁸⁰
- Detector : Gain⁹⁸¹
- Detector : ID⁹⁸²
- Detector : Offset⁹⁸³
- Detector : Type⁹⁸⁴
- DetectorSettings : Gain⁹⁸⁵
- DetectorSettings : ID⁹⁸⁶
- DetectorSettings : Offset⁹⁸⁷
- Experiment : ID⁹⁸⁸
- Experiment : Type⁹⁸⁹
- Image : AcquisitionDate⁹⁹⁰
- Image : ID⁹⁹¹
- Image : InstrumentRef⁹⁹²
- Image : Name⁹⁹³
- Instrument : ID⁹⁹⁴
- Objective : Correction⁹⁹⁵
- Objective : ID⁹⁹⁶
- Objective : Immersion⁹⁹⁷
- Objective : LensNA⁹⁹⁸

⁹⁷⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

⁹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

⁹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

⁹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID

⁹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type

⁹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

- Objective : Model⁹⁹⁹
- Objective : NominalMagnification¹⁰⁰⁰
- ObjectiveSettings : ID¹⁰⁰¹
- Pixels : BigEndian¹⁰⁰²
- Pixels : DimensionOrder¹⁰⁰³
- Pixels : ID¹⁰⁰⁴
- Pixels : Interleaved¹⁰⁰⁵
- Pixels : PhysicalSizeX¹⁰⁰⁶
- Pixels : PhysicalSizeY¹⁰⁰⁷
- Pixels : PhysicalSizeZ¹⁰⁰⁸
- Pixels : SignificantBits¹⁰⁰⁹
- Pixels : SizeC¹⁰¹⁰
- Pixels : SizeT¹⁰¹¹
- Pixels : SizeX¹⁰¹²
- Pixels : SizeY¹⁰¹³
- Pixels : SizeZ¹⁰¹⁴
- Pixels : Type¹⁰¹⁵
- Plane : TheC¹⁰¹⁶
- Plane : TheT¹⁰¹⁷
- Plane : TheZ¹⁰¹⁸

Total supported: 40

Total unknown or missing: 435

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁰¹⁹ or the previous versions¹⁰²⁰ page to find documentation for the version you are using.

18.2.18 BioRadSCNReader

This page lists supported metadata fields for the Bio-Formats Bio-Rad SCN format reader.

- ⁹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model
- ¹⁰⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification
- ¹⁰⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID
- ¹⁰⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ¹⁰⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ¹⁰⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ¹⁰⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ¹⁰⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ¹⁰⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ¹⁰⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ
- ¹⁰⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ¹⁰¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ¹⁰¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ¹⁰¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ¹⁰¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ¹⁰¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ¹⁰¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ¹⁰¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ¹⁰¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ¹⁰¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ¹⁰¹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ¹⁰²⁰<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)¹⁰²¹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 29 of them (6%).
- Of those, Bio-Formats fully or partially converts 29 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Bio-Rad SCN format reader:

- Channel : ID¹⁰²²
- Channel : SamplesPerPixel¹⁰²³
- Detector : ID¹⁰²⁴
- DetectorSettings : Binning¹⁰²⁵
- DetectorSettings : Gain¹⁰²⁶
- DetectorSettings : ID¹⁰²⁷
- Image : AcquisitionDate¹⁰²⁸
- Image : ID¹⁰²⁹
- Image : Name¹⁰³⁰
- Instrument : ID¹⁰³¹
- Microscope : Model¹⁰³²
- Microscope : SerialNumber¹⁰³³
- Pixels : BigEndian¹⁰³⁴
- Pixels : DimensionOrder¹⁰³⁵
- Pixels : ID¹⁰³⁶
- Pixels : Interleaved¹⁰³⁷
- Pixels : PhysicalSizeX¹⁰³⁸
- Pixels : PhysicalSizeY¹⁰³⁹
- Pixels : SignificantBits¹⁰⁴⁰
- Pixels : SizeC¹⁰⁴¹

¹⁰²¹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁰²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁰²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁰²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁰²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

¹⁰²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

¹⁰²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹⁰²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁰²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁰³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁰³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁰³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁰³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

¹⁰³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁰³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁰³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁰³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁰³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁰³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁰⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁰⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT¹⁰⁴²
- Pixels : SizeX¹⁰⁴³
- Pixels : SizeY¹⁰⁴⁴
- Pixels : SizeZ¹⁰⁴⁵
- Pixels : Type¹⁰⁴⁶
- Plane : ExposureTime¹⁰⁴⁷
- Plane : TheC¹⁰⁴⁸
- Plane : TheT¹⁰⁴⁹
- Plane : TheZ¹⁰⁵⁰

Total supported: 29

Total unknown or missing: 446

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁰⁵¹](#) or the [previous versions¹⁰⁵²](#) page to find documentation for the version you are using.

18.2.19 ImarisHDFReader

This page lists supported metadata fields for the Bio-Formats Bitplane Imaris 5.5 (HDF) format reader.

These fields are from the [OME data model¹⁰⁵³](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 23 of them (4%).
- Of those, Bio-Formats fully or partially converts 23 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Bitplane Imaris 5.5 (HDF) format reader:

- Channel : Color¹⁰⁵⁴
- Channel : ID¹⁰⁵⁵
- Channel : SamplesPerPixel¹⁰⁵⁶
- Image : AcquisitionDate¹⁰⁵⁷
- Image : ID¹⁰⁵⁸

¹⁰⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁰⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁰⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁰⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁰⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁰⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹⁰⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁰⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁰⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁰⁵¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰⁵²<http://www.openmicroscopy.org/site/support/legacy/>

¹⁰⁵³<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁰⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

¹⁰⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁰⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁰⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁰⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name¹⁰⁵⁹
- Pixels : BigEndian¹⁰⁶⁰
- Pixels : DimensionOrder¹⁰⁶¹
- Pixels : ID¹⁰⁶²
- Pixels : Interleaved¹⁰⁶³
- Pixels : PhysicalSizeX¹⁰⁶⁴
- Pixels : PhysicalSizeY¹⁰⁶⁵
- Pixels : PhysicalSizeZ¹⁰⁶⁶
- Pixels : SignificantBits¹⁰⁶⁷
- Pixels : SizeC¹⁰⁶⁸
- Pixels : SizeT¹⁰⁶⁹
- Pixels : SizeX¹⁰⁷⁰
- Pixels : SizeY¹⁰⁷¹
- Pixels : SizeZ¹⁰⁷²
- Pixels : Type¹⁰⁷³
- Plane : TheC¹⁰⁷⁴
- Plane : TheT¹⁰⁷⁵
- Plane : TheZ¹⁰⁷⁶

Total supported: 23

Total unknown or missing: 452

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁰⁷⁷ or the previous versions¹⁰⁷⁸ page to find documentation for the version you are using.

18.2.20 BrukerReader

This page lists supported metadata fields for the Bio-Formats Bruker format reader.

These fields are from the OME data model¹⁰⁷⁹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

¹⁰⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁰⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁰⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁰⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁰⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁰⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁰⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁰⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹⁰⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁰⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁰⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁰⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁰⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁰⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁰⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁰⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁰⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁰⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁰⁷⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰⁷⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁰⁷⁹<http://www.openmicroscopy.org/site/support/ome-model/>

- The file format itself supports 23 of them (4%).
- Of those, Bio-Formats fully or partially converts 23 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Bruker format reader:

- Channel : ID¹⁰⁸⁰
- Channel : SamplesPerPixel¹⁰⁸¹
- Experimenter : ID¹⁰⁸²
- Experimenter : Institution¹⁰⁸³
- Experimenter : LastName¹⁰⁸⁴
- Image : AcquisitionDate¹⁰⁸⁵
- Image : ExperimenterRef¹⁰⁸⁶
- Image : ID¹⁰⁸⁷
- Image : Name¹⁰⁸⁸
- Pixels : BigEndian¹⁰⁸⁹
- Pixels : DimensionOrder¹⁰⁹⁰
- Pixels : ID¹⁰⁹¹
- Pixels : Interleaved¹⁰⁹²
- Pixels : SignificantBits¹⁰⁹³
- Pixels : SizeC¹⁰⁹⁴
- Pixels : SizeT¹⁰⁹⁵
- Pixels : SizeX¹⁰⁹⁶
- Pixels : SizeY¹⁰⁹⁷
- Pixels : SizeZ¹⁰⁹⁸
- Pixels : Type¹⁰⁹⁹
- Plane : TheC¹¹⁰⁰
- Plane : TheT¹¹⁰¹
- Plane : TheZ¹¹⁰²

¹⁰⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁰⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁰⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

¹⁰⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_Institution

¹⁰⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

¹⁰⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁰⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID

¹⁰⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁰⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁰⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁰⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁰⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁰⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁰⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁰⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁰⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁰⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁰⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁰⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁰⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹¹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹¹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹¹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

Total supported: 23

Total unknown or missing: 452

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹¹⁰³](#) or the [previous versions¹¹⁰⁴](#) page to find documentation for the version you are using.

18.2.21 BurleighReader

This page lists supported metadata fields for the Bio-Formats Burleigh format reader.

These fields are from the [OME data model¹¹⁰⁵](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Burleigh format reader:

- Channel : ID¹¹⁰⁶
- Channel : SamplesPerPixel¹¹⁰⁷
- Image : AcquisitionDate¹¹⁰⁸
- Image : ID¹¹⁰⁹
- Image : Name¹¹¹⁰
- Pixels : BigEndian¹¹¹¹
- Pixels : DimensionOrder¹¹¹²
- Pixels : ID¹¹¹³
- Pixels : Interleaved¹¹¹⁴
- Pixels : PhysicalSizeX¹¹¹⁵
- Pixels : PhysicalSizeY¹¹¹⁶
- Pixels : PhysicalSizeZ¹¹¹⁷
- Pixels : SignificantBits¹¹¹⁸
- Pixels : SizeC¹¹¹⁹

¹¹⁰³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹⁰⁴<http://www.openmicroscopy.org/site/support/legacy/>

¹¹⁰⁵<http://www.openmicroscopy.org/site/support/ome-model/>

¹¹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹¹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹¹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹¹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹¹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹¹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹¹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹¹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹¹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹¹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹¹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹¹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹¹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹¹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT¹¹²⁰
- Pixels : SizeX¹¹²¹
- Pixels : SizeY¹¹²²
- Pixels : SizeZ¹¹²³
- Pixels : Type¹¹²⁴
- Plane : TheC¹¹²⁵
- Plane : TheT¹¹²⁶
- Plane : TheZ¹¹²⁷

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹¹²⁸ or the previous versions¹¹²⁹ page to find documentation for the version you are using.

18.2.22 DNGReader

This page lists supported metadata fields for the Bio-Formats DNG format reader.

These fields are from the OME data model¹¹³⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats DNG format reader:

- Channel : ID¹¹³¹
- Channel : SamplesPerPixel¹¹³²
- Image : AcquisitionDate¹¹³³
- Image : ID¹¹³⁴
- Image : Name¹¹³⁵
- Pixels : BigEndian¹¹³⁶

¹¹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹¹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹¹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹¹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹¹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹¹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹¹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹¹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹¹²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹²⁹<http://www.openmicroscopy.org/site/support/legacy/>

¹¹³⁰<http://www.openmicroscopy.org/site/support/ome-model/>

¹¹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹¹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹¹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹¹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹¹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹¹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

- Pixels : DimensionOrder¹¹³⁷
- Pixels : ID¹¹³⁸
- Pixels : Interleaved¹¹³⁹
- Pixels : SignificantBits¹¹⁴⁰
- Pixels : SizeC¹¹⁴¹
- Pixels : SizeT¹¹⁴²
- Pixels : SizeX¹¹⁴³
- Pixels : SizeY¹¹⁴⁴
- Pixels : SizeZ¹¹⁴⁵
- Pixels : Type¹¹⁴⁶
- Plane : TheC¹¹⁴⁷
- Plane : TheT¹¹⁴⁸
- Plane : TheZ¹¹⁴⁹

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹¹⁵⁰](#) or the [previous versions¹¹⁵¹](#) page to find documentation for the version you are using.

18.2.23 CellH5Reader

This page lists supported metadata fields for the Bio-Formats CellH5 (HDF) format reader.

These fields are from the [OME data model¹¹⁵²](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 31 of them (6%).
- Of those, Bio-Formats fully or partially converts 31 (100%).

Supported fields

These fields are fully supported by the Bio-Formats CellH5 (HDF) format reader:

- Channel : ID¹¹⁵³

¹¹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹¹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹¹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹¹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹¹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹¹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹¹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹¹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹¹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹¹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹¹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹¹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹¹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹¹⁵⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹⁵¹<http://www.openmicroscopy.org/site/support/legacy/>

¹¹⁵²<http://www.openmicroscopy.org/site/support/ome-model/>

¹¹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

- Channel : SamplesPerPixel¹¹⁵⁴
- Image : AcquisitionDate¹¹⁵⁵
- Image : ID¹¹⁵⁶
- Image : Name¹¹⁵⁷
- Image : ROIRef¹¹⁵⁸
- Pixels : BigEndian¹¹⁵⁹
- Pixels : DimensionOrder¹¹⁶⁰
- Pixels : ID¹¹⁶¹
- Pixels : Interleaved¹¹⁶²
- Pixels : SignificantBits¹¹⁶³
- Pixels : SizeC¹¹⁶⁴
- Pixels : SizeT¹¹⁶⁵
- Pixels : SizeX¹¹⁶⁶
- Pixels : SizeY¹¹⁶⁷
- Pixels : SizeZ¹¹⁶⁸
- Pixels : Type¹¹⁶⁹
- Plane : TheC¹¹⁷⁰
- Plane : TheT¹¹⁷¹
- Plane : TheZ¹¹⁷²
- ROI : ID¹¹⁷³
- ROI : Name¹¹⁷⁴
- Rectangle : Height¹¹⁷⁵
- Rectangle : ID¹¹⁷⁶
- Rectangle : StrokeColor¹¹⁷⁷
- Rectangle : TheC¹¹⁷⁸
- Rectangle : TheT¹¹⁷⁹

¹¹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹¹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹¹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹¹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹¹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

¹¹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹¹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹¹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹¹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹¹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹¹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹¹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹¹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹¹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹¹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹¹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹¹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹¹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹¹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹¹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

¹¹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Name

¹¹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

¹¹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

¹¹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

¹¹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC

¹¹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

- Rectangle : TheZ¹¹⁸⁰
- Rectangle : Width¹¹⁸¹
- Rectangle : X¹¹⁸²
- Rectangle : Y¹¹⁸³

Total supported: 31

Total unknown or missing: 444

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹¹⁸⁴ or the previous versions¹¹⁸⁵ page to find documentation for the version you are using.

18.2.24 CellomicsReader

This page lists supported metadata fields for the Bio-Formats Cellomics C01 format reader.

These fields are from the OME data model¹¹⁸⁶. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 31 of them (6%).
- Of those, Bio-Formats fully or partially converts 31 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Cellomics C01 format reader:

- Channel : ID¹¹⁸⁷
- Channel : SamplesPerPixel¹¹⁸⁸
- Image : AcquisitionDate¹¹⁸⁹
- Image : ID¹¹⁹⁰
- Image : Name¹¹⁹¹
- Pixels : BigEndian¹¹⁹²
- Pixels : DimensionOrder¹¹⁹³
- Pixels : ID¹¹⁹⁴
- Pixels : Interleaved¹¹⁹⁵
- Pixels : PhysicalSizeX¹¹⁹⁶

¹¹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

¹¹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

¹¹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

¹¹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

¹¹⁸⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹⁸⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹¹⁸⁶<http://www.openmicroscopy.org/site/support/ome-model/>

¹¹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹¹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹¹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹¹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹¹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹¹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹¹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹¹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹¹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹¹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

- Pixels : PhysicalSizeY¹¹⁹⁷
- Pixels : SignificantBits¹¹⁹⁸
- Pixels : SizeC¹¹⁹⁹
- Pixels : SizeT¹²⁰⁰
- Pixels : SizeX¹²⁰¹
- Pixels : SizeY¹²⁰²
- Pixels : SizeZ¹²⁰³
- Pixels : Type¹²⁰⁴
- Plane : TheC¹²⁰⁵
- Plane : TheT¹²⁰⁶
- Plane : TheZ¹²⁰⁷
- Plate : ColumnNamingConvention¹²⁰⁸
- Plate : ID¹²⁰⁹
- Plate : Name¹²¹⁰
- Plate : RowNamingConvention¹²¹¹
- Well : Column¹²¹²
- Well : ID¹²¹³
- Well : Row¹²¹⁴
- WellSample : ID¹²¹⁵
- WellSample : ImageRef¹²¹⁶
- WellSample : Index¹²¹⁷

Total supported: 31

Total unknown or missing: 444

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹²¹⁸ or the previous versions¹²¹⁹ page to find documentation for the version you are using.

¹¹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹¹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹¹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹²⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹²⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹²⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹²⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹²⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹²⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹²⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹²⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹²⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

¹²⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

¹²¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

¹²¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

¹²¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

¹²¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

¹²¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

¹²¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

¹²¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

¹²¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

¹²¹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹²¹⁹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.25 CellSensReader

This page lists supported metadata fields for the Bio-Formats CellSens VSI format reader.

These fields are from the [OME data model](#)¹²²⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 46 of them (9%).
- Of those, Bio-Formats fully or partially converts 46 (100%).

Supported fields

These fields are fully supported by the Bio-Formats CellSens VSI format reader:

- Channel : EmissionWavelength¹²²¹
- Channel : ID¹²²²
- Channel : Name¹²²³
- Channel : SamplesPerPixel¹²²⁴
- Detector : Gain¹²²⁵
- Detector : ID¹²²⁶
- Detector : Manufacturer¹²²⁷
- Detector : Model¹²²⁸
- Detector : Offset¹²²⁹
- Detector : SerialNumber¹²³⁰
- Detector : Type¹²³¹
- DetectorSettings : Binning¹²³²
- DetectorSettings : Gain¹²³³
- DetectorSettings : ID¹²³⁴
- DetectorSettings : Offset¹²³⁵
- Image : AcquisitionDate¹²³⁶
- Image : ID¹²³⁷
- Image : InstrumentRef¹²³⁸
- Image : Name¹²³⁹

¹²²⁰<http://www.openmicroscopy.org/site/support/ome-model/>

¹²²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

¹²²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹²²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

¹²²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹²²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

¹²²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹²²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

¹²²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹²²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

¹²³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

¹²³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹²³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

¹²³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

¹²³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹²³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

¹²³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹²³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹²³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹²³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

- Instrument : ID¹²⁴⁰
- Objective : ID¹²⁴¹
- Objective : LensNA¹²⁴²
- Objective : Model¹²⁴³
- Objective : NominalMagnification¹²⁴⁴
- Objective : WorkingDistance¹²⁴⁵
- ObjectiveSettings : ID¹²⁴⁶
- ObjectiveSettings : RefractiveIndex¹²⁴⁷
- Pixels : BigEndian¹²⁴⁸
- Pixels : DimensionOrder¹²⁴⁹
- Pixels : ID¹²⁵⁰
- Pixels : Interleaved¹²⁵¹
- Pixels : PhysicalSizeX¹²⁵²
- Pixels : PhysicalSizeY¹²⁵³
- Pixels : SignificantBits¹²⁵⁴
- Pixels : SizeC¹²⁵⁵
- Pixels : SizeT¹²⁵⁶
- Pixels : SizeX¹²⁵⁷
- Pixels : SizeY¹²⁵⁸
- Pixels : SizeZ¹²⁵⁹
- Pixels : Type¹²⁶⁰
- Plane : ExposureTime¹²⁶¹
- Plane : PositionX¹²⁶²
- Plane : PositionY¹²⁶³
- Plane : TheC¹²⁶⁴
- Plane : TheT¹²⁶⁵

¹²⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹²⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹²⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

¹²⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹²⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹²⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

¹²⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹²⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

¹²⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹²⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹²⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹²⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹²⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹²⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹²⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹²⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹²⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹²⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹²⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹²⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹²⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹²⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹²⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹²⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹²⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹²⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ¹²⁶⁶

Total supported: 46

Total unknown or missing: 429

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹²⁶⁷](#) or the [previous versions¹²⁶⁸](#) page to find documentation for the version you are using.

18.2.26 CellVoyagerReader

This page lists supported metadata fields for the Bio-Formats CellVoyager format reader.

These fields are from the [OME data model¹²⁶⁹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 34 of them (7%).
- Of those, Bio-Formats fully or partially converts 34 (100%).

Supported fields

These fields are fully supported by the Bio-Formats CellVoyager format reader:

- Channel : ID¹²⁷⁰
- Channel : Name¹²⁷¹
- Channel : PinholeSize¹²⁷²
- Channel : SamplesPerPixel¹²⁷³
- Image : AcquisitionDate¹²⁷⁴
- Image : ID¹²⁷⁵
- Image : Name¹²⁷⁶
- Pixels : BigEndian¹²⁷⁷
- Pixels : DimensionOrder¹²⁷⁸
- Pixels : ID¹²⁷⁹
- Pixels : Interleaved¹²⁸⁰
- Pixels : SignificantBits¹²⁸¹
- Pixels : SizeC¹²⁸²

¹²⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹²⁶⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹²⁶⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹²⁶⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹²⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹²⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

¹²⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

¹²⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹²⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹²⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹²⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹²⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹²⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹²⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹²⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹²⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹²⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT¹²⁸³
- Pixels : SizeX¹²⁸⁴
- Pixels : SizeY¹²⁸⁵
- Pixels : SizeZ¹²⁸⁶
- Pixels : Type¹²⁸⁷
- Plane : TheC¹²⁸⁸
- Plane : TheT¹²⁸⁹
- Plane : TheZ¹²⁹⁰
- Plate : Columns¹²⁹¹
- Plate : Rows¹²⁹²
- PlateAcquisition : EndTime¹²⁹³
- PlateAcquisition : ID¹²⁹⁴
- PlateAcquisition : MaximumFieldCount¹²⁹⁵
- PlateAcquisition : StartTime¹²⁹⁶
- Well : Column¹²⁹⁷
- Well : ID¹²⁹⁸
- Well : Row¹²⁹⁹
- WellSample : ID¹³⁰⁰
- WellSample : Index¹³⁰¹
- WellSample : PositionX¹³⁰²
- WellSample : PositionY¹³⁰³

Total supported: 34

Total unknown or missing: 441

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹³⁰⁴ or the previous versions¹³⁰⁵ page to find documentation for the version you are using.

¹²⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹²⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹²⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹²⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹²⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹²⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹²⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹²⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹²⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Columns

¹²⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Rows

¹²⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_EndTime

¹²⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

¹²⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

¹²⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_StartTime

¹²⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

¹²⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

¹²⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

¹³⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

¹³⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

¹³⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

¹³⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

¹³⁰⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³⁰⁵<http://www.openmicroscopy.org/site/support/legacy/>

18.2.27 DeltavisionReader

This page lists supported metadata fields for the Bio-Formats Deltavision format reader.

These fields are from the [OME data model](http://www.openmicroscopy.org/site/support/ome-model/)¹³⁰⁶. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 52 of them (10%).
- Of those, Bio-Formats fully or partially converts 52 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Deltavision format reader:

- Channel : EmissionWavelength¹³⁰⁷
- Channel : ExcitationWavelength¹³⁰⁸
- Channel : ID¹³⁰⁹
- Channel : NDFilter¹³¹⁰
- Channel : Name¹³¹¹
- Channel : SamplesPerPixel¹³¹²
- Detector : ID¹³¹³
- Detector : Model¹³¹⁴
- Detector : Type¹³¹⁵
- DetectorSettings : Binning¹³¹⁶
- DetectorSettings : Gain¹³¹⁷
- DetectorSettings : ID¹³¹⁸
- DetectorSettings : ReadOutRate¹³¹⁹
- Image : AcquisitionDate¹³²⁰
- Image : Description¹³²¹
- Image : ID¹³²²
- Image : InstrumentRef¹³²³
- Image : Name¹³²⁴
- ImagingEnvironment : Temperature¹³²⁵

¹³⁰⁶<http://www.openmicroscopy.org/site/support/ome-model/>

¹³⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

¹³⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

¹³⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹³¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_NDFilter

¹³¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

¹³¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹³¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹³¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹³¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹³¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

¹³¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

¹³¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹³¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

¹³²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹³²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹³²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹³²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹³²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹³²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

- Instrument : ID¹³²⁶
- Objective : CalibratedMagnification¹³²⁷
- Objective : Correction¹³²⁸
- Objective : ID¹³²⁹
- Objective : Immersion¹³³⁰
- Objective : LensNA¹³³¹
- Objective : Manufacturer¹³³²
- Objective : Model¹³³³
- Objective : NominalMagnification¹³³⁴
- Objective : WorkingDistance¹³³⁵
- ObjectiveSettings : ID¹³³⁶
- Pixels : BigEndian¹³³⁷
- Pixels : DimensionOrder¹³³⁸
- Pixels : ID¹³³⁹
- Pixels : Interleaved¹³⁴⁰
- Pixels : PhysicalSizeX¹³⁴¹
- Pixels : PhysicalSizeY¹³⁴²
- Pixels : PhysicalSizeZ¹³⁴³
- Pixels : SignificantBits¹³⁴⁴
- Pixels : SizeC¹³⁴⁵
- Pixels : SizeT¹³⁴⁶
- Pixels : SizeX¹³⁴⁷
- Pixels : SizeY¹³⁴⁸
- Pixels : SizeZ¹³⁴⁹
- Pixels : Type¹³⁵⁰
- Plane : DeltaT¹³⁵¹

¹³²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹³²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

¹³²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

¹³²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹³³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

¹³³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

¹³³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

¹³³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹³³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹³³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

¹³³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹³³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹³³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹³³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹³⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹³⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹³⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹³⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹³⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹³⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹³⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹³⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹³⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹³⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹³⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹³⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

- Plane : ExposureTime¹³⁵²
- Plane : PositionX¹³⁵³
- Plane : PositionY¹³⁵⁴
- Plane : PositionZ¹³⁵⁵
- Plane : TheC¹³⁵⁶
- Plane : TheT¹³⁵⁷
- Plane : TheZ¹³⁵⁸

Total supported: 52

Total unknown or missing: 423

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹³⁵⁹](#) or the [previous versions¹³⁶⁰](#) page to find documentation for the version you are using.

18.2.28 DicomReader

This page lists supported metadata fields for the Bio-Formats DICOM format reader.

These fields are from the [OME data model¹³⁶¹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 23 of them (4%).
- Of those, Bio-Formats fully or partially converts 23 (100%).

Supported fields

These fields are fully supported by the Bio-Formats DICOM format reader:

- Channel : ID¹³⁶²
- Channel : SamplesPerPixel¹³⁶³
- Image : AcquisitionDate¹³⁶⁴
- Image : Description¹³⁶⁵
- Image : ID¹³⁶⁶
- Image : Name¹³⁶⁷
- Pixels : BigEndian¹³⁶⁸

¹³⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹³⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹³⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹³⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

¹³⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹³⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹³⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹³⁵⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³⁶⁰<http://www.openmicroscopy.org/site/support/legacy/>

¹³⁶¹<http://www.openmicroscopy.org/site/support/ome-model/>

¹³⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹³⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹³⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹³⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹³⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹³⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹³⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

- Pixels : DimensionOrder¹³⁶⁹
- Pixels : ID¹³⁷⁰
- Pixels : Interleaved¹³⁷¹
- Pixels : PhysicalSizeX¹³⁷²
- Pixels : PhysicalSizeY¹³⁷³
- Pixels : PhysicalSizeZ¹³⁷⁴
- Pixels : SignificantBits¹³⁷⁵
- Pixels : SizeC¹³⁷⁶
- Pixels : SizeT¹³⁷⁷
- Pixels : SizeX¹³⁷⁸
- Pixels : SizeY¹³⁷⁹
- Pixels : SizeZ¹³⁸⁰
- Pixels : Type¹³⁸¹
- Plane : TheC¹³⁸²
- Plane : TheT¹³⁸³
- Plane : TheZ¹³⁸⁴

Total supported: 23

Total unknown or missing: 452

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹³⁸⁵ or the previous versions¹³⁸⁶ page to find documentation for the version you are using.

18.2.29 Ecat7Reader

This page lists supported metadata fields for the Bio-Formats ECAT7 format reader.

These fields are from the OME data model¹³⁸⁷. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 23 of them (4%).
- Of those, Bio-Formats fully or partially converts 23 (100%).

¹³⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹³⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹³⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹³⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹³⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹³⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹³⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹³⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹³⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹³⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹³⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹³⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹³⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹³⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹³⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹³⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹³⁸⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³⁸⁶<http://www.openmicroscopy.org/site/support/legacy/>

¹³⁸⁷<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats ECAT7 format reader:

- Channel : ID¹³⁸⁸
- Channel : SamplesPerPixel¹³⁸⁹
- Image : AcquisitionDate¹³⁹⁰
- Image : Description¹³⁹¹
- Image : ID¹³⁹²
- Image : Name¹³⁹³
- Pixels : BigEndian¹³⁹⁴
- Pixels : DimensionOrder¹³⁹⁵
- Pixels : ID¹³⁹⁶
- Pixels : Interleaved¹³⁹⁷
- Pixels : PhysicalSizeX¹³⁹⁸
- Pixels : PhysicalSizeY¹³⁹⁹
- Pixels : PhysicalSizeZ¹⁴⁰⁰
- Pixels : SignificantBits¹⁴⁰¹
- Pixels : SizeC¹⁴⁰²
- Pixels : SizeT¹⁴⁰³
- Pixels : SizeX¹⁴⁰⁴
- Pixels : SizeY¹⁴⁰⁵
- Pixels : SizeZ¹⁴⁰⁶
- Pixels : Type¹⁴⁰⁷
- Plane : TheC¹⁴⁰⁸
- Plane : TheT¹⁴⁰⁹
- Plane : TheZ¹⁴¹⁰

Total supported: 23

Total unknown or missing: 452

¹³⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹³⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹³⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹³⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹³⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹³⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹³⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹³⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹³⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹³⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹³⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹³⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁴⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹⁴⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁴⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁴⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁴⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁴⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁴⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁴⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁴⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁴⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁴¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁴¹¹](#) or the [previous versions¹⁴¹²](#) page to find documentation for the version you are using.

18.2.30 EPSReader

This page lists supported metadata fields for the Bio-Formats Encapsulated PostScript format reader.

These fields are from the [OME data model¹⁴¹³](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Encapsulated PostScript format reader:

- Channel : ID¹⁴¹⁴
- Channel : SamplesPerPixel¹⁴¹⁵
- Image : AcquisitionDate¹⁴¹⁶
- Image : ID¹⁴¹⁷
- Image : Name¹⁴¹⁸
- Pixels : BigEndian¹⁴¹⁹
- Pixels : DimensionOrder¹⁴²⁰
- Pixels : ID¹⁴²¹
- Pixels : Interleaved¹⁴²²
- Pixels : SignificantBits¹⁴²³
- Pixels : SizeC¹⁴²⁴
- Pixels : SizeT¹⁴²⁵
- Pixels : SizeX¹⁴²⁶
- Pixels : SizeY¹⁴²⁷
- Pixels : SizeZ¹⁴²⁸
- Pixels : Type¹⁴²⁹

¹⁴¹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁴¹²<http://www.openmicroscopy.org/site/support/legacy/>

¹⁴¹³<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁴¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁴¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁴¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁴¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁴¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁴¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁴²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁴²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁴²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁴²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁴²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁴²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁴²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁴²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁴²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁴²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC¹⁴³⁰
- Plane : TheT¹⁴³¹
- Plane : TheZ¹⁴³²

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁴³³](#) or the [previous versions¹⁴³⁴](#) page to find documentation for the version you are using.

18.2.31 FlexReader

This page lists supported metadata fields for the Bio-Formats Evotec Flex format reader.

These fields are from the [OME data model¹⁴³⁵](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 69 of them (14%).
- Of those, Bio-Formats fully or partially converts 69 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Evotec Flex format reader:

- Channel : ID¹⁴³⁶
- Channel : LightSourceSettingsID¹⁴³⁷
- Channel : Name¹⁴³⁸
- Channel : SamplesPerPixel¹⁴³⁹
- Detector : ID¹⁴⁴⁰
- Detector : Type¹⁴⁴¹
- DetectorSettings : Binning¹⁴⁴²
- DetectorSettings : ID¹⁴⁴³
- Dichroic : ID¹⁴⁴⁴
- Dichroic : Model¹⁴⁴⁵
- Filter : FilterWheel¹⁴⁴⁶

¹⁴³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁴³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁴³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁴³³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁴³⁴<http://www.openmicroscopy.org/site/support/legacy/>

¹⁴³⁵<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁴³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁴³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID

¹⁴³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

¹⁴³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁴⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁴⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹⁴⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

¹⁴⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹⁴⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

¹⁴⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁴⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_FilterWheel

- Filter : ID¹⁴⁴⁷
- Filter : Model¹⁴⁴⁸
- Image : AcquisitionDate¹⁴⁴⁹
- Image : ID¹⁴⁵⁰
- Image : InstrumentRef¹⁴⁵¹
- Image : Name¹⁴⁵²
- Instrument : ID¹⁴⁵³
- Laser : ID¹⁴⁵⁴
- Laser : LaserMedium¹⁴⁵⁵
- Laser : Type¹⁴⁵⁶
- Laser : Wavelength¹⁴⁵⁷
- LightPath : DichroicRef¹⁴⁵⁸
- LightPath : EmissionFilterRef¹⁴⁵⁹
- LightPath : ExcitationFilterRef¹⁴⁶⁰
- Objective : CalibratedMagnification¹⁴⁶¹
- Objective : Correction¹⁴⁶²
- Objective : ID¹⁴⁶³
- Objective : Immersion¹⁴⁶⁴
- Objective : LensNA¹⁴⁶⁵
- ObjectiveSettings : ID¹⁴⁶⁶
- Pixels : BigEndian¹⁴⁶⁷
- Pixels : DimensionOrder¹⁴⁶⁸
- Pixels : ID¹⁴⁶⁹
- Pixels : Interleaved¹⁴⁷⁰
- Pixels : PhysicalSizeX¹⁴⁷¹
- Pixels : PhysicalSizeY¹⁴⁷²

¹⁴⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

¹⁴⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁴⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁴⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁴⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁴⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁴⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁴⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

¹⁴⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

¹⁴⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

¹⁴⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

¹⁴⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID

¹⁴⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

¹⁴⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

¹⁴⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

¹⁴⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

¹⁴⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁴⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

¹⁴⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

¹⁴⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁴⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁴⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁴⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁴⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁴⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁴⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

- Pixels : SignificantBits¹⁴⁷³
- Pixels : SizeC¹⁴⁷⁴
- Pixels : SizeT¹⁴⁷⁵
- Pixels : SizeX¹⁴⁷⁶
- Pixels : SizeY¹⁴⁷⁷
- Pixels : SizeZ¹⁴⁷⁸
- Pixels : Type¹⁴⁷⁹
- Plane : DeltaT¹⁴⁸⁰
- Plane : ExposureTime¹⁴⁸¹
- Plane : PositionX¹⁴⁸²
- Plane : PositionY¹⁴⁸³
- Plane : PositionZ¹⁴⁸⁴
- Plane : TheC¹⁴⁸⁵
- Plane : TheT¹⁴⁸⁶
- Plane : TheZ¹⁴⁸⁷
- Plate : ColumnNamingConvention¹⁴⁸⁸
- Plate : ExternalIdentifier¹⁴⁸⁹
- Plate : ID¹⁴⁹⁰
- Plate : Name¹⁴⁹¹
- Plate : RowNamingConvention¹⁴⁹²
- PlateAcquisition : ID¹⁴⁹³
- PlateAcquisition : MaximumFieldCount¹⁴⁹⁴
- PlateAcquisition : StartTime¹⁴⁹⁵
- PlateAcquisition : WellSampleRef¹⁴⁹⁶
- Well : Column¹⁴⁹⁷
- Well : ID¹⁴⁹⁸

¹⁴⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁴⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁴⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁴⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁴⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁴⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁴⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁴⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

¹⁴⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹⁴⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹⁴⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹⁴⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

¹⁴⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁴⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁴⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁴⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

¹⁴⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ExternalIdentifier

¹⁴⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

¹⁴⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

¹⁴⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

¹⁴⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

¹⁴⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

¹⁴⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_StartTime

¹⁴⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

¹⁴⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

¹⁴⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

- Well : Row¹⁴⁹⁹
- WellSample : ID¹⁵⁰⁰
- WellSample : ImageRef¹⁵⁰¹
- WellSample : Index¹⁵⁰²
- WellSample : PositionX¹⁵⁰³
- WellSample : PositionY¹⁵⁰⁴

Total supported: 69

Total unknown or missing: 406

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁵⁰⁵ or the previous versions¹⁵⁰⁶ page to find documentation for the version you are using.

18.2.32 FEIReader

This page lists supported metadata fields for the Bio-Formats FEI/Philips format reader.

These fields are from the OME data model¹⁵⁰⁷. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats FEI/Philips format reader:

- Channel : ID¹⁵⁰⁸
- Channel : SamplesPerPixel¹⁵⁰⁹
- Image : AcquisitionDate¹⁵¹⁰
- Image : ID¹⁵¹¹
- Image : Name¹⁵¹²
- Pixels : BigEndian¹⁵¹³
- Pixels : DimensionOrder¹⁵¹⁴
- Pixels : ID¹⁵¹⁵

¹⁴⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

¹⁵⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

¹⁵⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

¹⁵⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

¹⁵⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

¹⁵⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

¹⁵⁰⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁵⁰⁶<http://www.openmicroscopy.org/site/support/legacy/>

¹⁵⁰⁷<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁵⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁵⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁵¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁵¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁵¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁵¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁵¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁵¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

- Pixels : Interleaved¹⁵¹⁶
- Pixels : SignificantBits¹⁵¹⁷
- Pixels : SizeC¹⁵¹⁸
- Pixels : SizeT¹⁵¹⁹
- Pixels : SizeX¹⁵²⁰
- Pixels : SizeY¹⁵²¹
- Pixels : SizeZ¹⁵²²
- Pixels : Type¹⁵²³
- Plane : TheC¹⁵²⁴
- Plane : TheT¹⁵²⁵
- Plane : TheZ¹⁵²⁶

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version¹⁵²⁷](#) or the [previous versions¹⁵²⁸](#) page to find documentation for the version you are using.

18.2.33 FEITiffReader

This page lists supported metadata fields for the Bio-Formats FEI TIFF format reader.

These fields are from the [OME data model¹⁵²⁹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 39 of them (8%).
- Of those, Bio-Formats fully or partially converts 39 (100%).

Supported fields

These fields are fully supported by the Bio-Formats FEI TIFF format reader:

- Channel : ID¹⁵³⁰
- Channel : SamplesPerPixel¹⁵³¹
- Detector : ID¹⁵³²

¹⁵¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁵¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁵¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁵¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁵²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁵²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁵²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁵²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁵²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁵²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁵²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁵²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁵²⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁵²⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁵³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁵³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁵³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

- Detector : Model¹⁵³³
- Detector : Type¹⁵³⁴
- Experimenter : ID¹⁵³⁵
- Experimenter : LastName¹⁵³⁶
- Image : AcquisitionDate¹⁵³⁷
- Image : Description¹⁵³⁸
- Image : ID¹⁵³⁹
- Image : InstrumentRef¹⁵⁴⁰
- Image : Name¹⁵⁴¹
- Instrument : ID¹⁵⁴²
- Microscope : Model¹⁵⁴³
- Objective : Correction¹⁵⁴⁴
- Objective : ID¹⁵⁴⁵
- Objective : Immersion¹⁵⁴⁶
- Objective : NominalMagnification¹⁵⁴⁷
- Pixels : BigEndian¹⁵⁴⁸
- Pixels : DimensionOrder¹⁵⁴⁹
- Pixels : ID¹⁵⁵⁰
- Pixels : Interleaved¹⁵⁵¹
- Pixels : PhysicalSizeX¹⁵⁵²
- Pixels : PhysicalSizeY¹⁵⁵³
- Pixels : SignificantBits¹⁵⁵⁴
- Pixels : SizeC¹⁵⁵⁵
- Pixels : SizeT¹⁵⁵⁶
- Pixels : SizeX¹⁵⁵⁷
- Pixels : SizeY¹⁵⁵⁸

¹⁵³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁵³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹⁵³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

¹⁵³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

¹⁵³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁵³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹⁵³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁵⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁵⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁵⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁵⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁵⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

¹⁵⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁵⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

¹⁵⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹⁵⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁵⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁵⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁵⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁵⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁵⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁵⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁵⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁵⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁵⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁵⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ¹⁵⁵⁹
- Pixels : TimeIncrement¹⁵⁶⁰
- Pixels : Type¹⁵⁶¹
- Plane : TheC¹⁵⁶²
- Plane : TheT¹⁵⁶³
- Plane : TheZ¹⁵⁶⁴
- StageLabel : Name¹⁵⁶⁵
- StageLabel : X¹⁵⁶⁶
- StageLabel : Y¹⁵⁶⁷
- StageLabel : Z¹⁵⁶⁸

Total supported: 39

Total unknown or missing: 436

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁵⁶⁹](#) or the [previous versions¹⁵⁷⁰](#) page to find documentation for the version you are using.

18.2.34 FitsReader

This page lists supported metadata fields for the Bio-Formats Flexible Image Transport System format reader.

These fields are from the [OME data model¹⁵⁷¹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Flexible Image Transport System format reader:

- Channel : ID¹⁵⁷²
- Channel : SamplesPerPixel¹⁵⁷³
- Image : AcquisitionDate¹⁵⁷⁴
- Image : ID¹⁵⁷⁵

¹⁵⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁵⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

¹⁵⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁵⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁵⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁵⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁵⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Name

¹⁵⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_X

¹⁵⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Y

¹⁵⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Z

¹⁵⁶⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁵⁷⁰<http://www.openmicroscopy.org/site/support/legacy/>

¹⁵⁷¹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁵⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁵⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁵⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁵⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name¹⁵⁷⁶
- Pixels : BigEndian¹⁵⁷⁷
- Pixels : DimensionOrder¹⁵⁷⁸
- Pixels : ID¹⁵⁷⁹
- Pixels : Interleaved¹⁵⁸⁰
- Pixels : SignificantBits¹⁵⁸¹
- Pixels : SizeC¹⁵⁸²
- Pixels : SizeT¹⁵⁸³
- Pixels : SizeX¹⁵⁸⁴
- Pixels : SizeY¹⁵⁸⁵
- Pixels : SizeZ¹⁵⁸⁶
- Pixels : Type¹⁵⁸⁷
- Plane : TheC¹⁵⁸⁸
- Plane : TheT¹⁵⁸⁹
- Plane : TheZ¹⁵⁹⁰

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁵⁹¹ or the previous versions¹⁵⁹² page to find documentation for the version you are using.

18.2.35 GatanDM2Reader

This page lists supported metadata fields for the Bio-Formats Gatan DM2 format reader.

These fields are from the OME data model¹⁵⁹³. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 30 of them (6%).
- Of those, Bio-Formats fully or partially converts 30 (100%).

¹⁵⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁵⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁵⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁵⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁵⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁵⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁵⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁵⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁵⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁵⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁵⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁵⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁵⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁵⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁵⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁵⁹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁵⁹²<http://www.openmicroscopy.org/site/support/legacy/>

¹⁵⁹³<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Gatan DM2 format reader:

- Channel : ID¹⁵⁹⁴
- Channel : SamplesPerPixel¹⁵⁹⁵
- Detector : ID¹⁵⁹⁶
- DetectorSettings : Binning¹⁵⁹⁷
- DetectorSettings : ID¹⁵⁹⁸
- Experimenter : FirstName¹⁵⁹⁹
- Experimenter : ID¹⁶⁰⁰
- Experimenter : LastName¹⁶⁰¹
- Image : AcquisitionDate¹⁶⁰²
- Image : ExperimenterRef¹⁶⁰³
- Image : ID¹⁶⁰⁴
- Image : InstrumentRef¹⁶⁰⁵
- Image : Name¹⁶⁰⁶
- Instrument : ID¹⁶⁰⁷
- Pixels : BigEndian¹⁶⁰⁸
- Pixels : DimensionOrder¹⁶⁰⁹
- Pixels : ID¹⁶¹⁰
- Pixels : Interleaved¹⁶¹¹
- Pixels : PhysicalSizeX¹⁶¹²
- Pixels : PhysicalSizeY¹⁶¹³
- Pixels : SignificantBits¹⁶¹⁴
- Pixels : SizeC¹⁶¹⁵
- Pixels : SizeT¹⁶¹⁶
- Pixels : SizeX¹⁶¹⁷

¹⁵⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁵⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁵⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁵⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

¹⁵⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹⁵⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_FirstName

¹⁶⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

¹⁶⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

¹⁶⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁶⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID

¹⁶⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁶⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁶⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁶⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁶⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁶⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁶¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁶¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁶¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁶¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁶¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁶¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁶¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁶¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

- Pixels : SizeY¹⁶¹⁸
- Pixels : SizeZ¹⁶¹⁹
- Pixels : Type¹⁶²⁰
- Plane : TheC¹⁶²¹
- Plane : TheT¹⁶²²
- Plane : TheZ¹⁶²³

Total supported: 30

Total unknown or missing: 445

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁶²⁴ or the previous versions¹⁶²⁵ page to find documentation for the version you are using.

18.2.36 GatanReader

This page lists supported metadata fields for the Bio-Formats Gatan Digital Micrograph format reader.

These fields are from the OME data model¹⁶²⁶. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 36 of them (7%).
- Of those, Bio-Formats fully or partially converts 36 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Gatan Digital Micrograph format reader:

- Channel : AcquisitionMode¹⁶²⁷
- Channel : ID¹⁶²⁸
- Channel : SamplesPerPixel¹⁶²⁹
- Detector : ID¹⁶³⁰
- DetectorSettings : ID¹⁶³¹
- DetectorSettings : Voltage¹⁶³²
- Image : AcquisitionDate¹⁶³³
- Image : ID¹⁶³⁴

¹⁶¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁶¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁶²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁶²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁶²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁶²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁶²⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁶²⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹⁶²⁶<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁶²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_AcquisitionMode

¹⁶²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁶²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁶³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁶³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹⁶³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

¹⁶³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁶³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name¹⁶³⁵
- Instrument : ID¹⁶³⁶
- Objective : Correction¹⁶³⁷
- Objective : ID¹⁶³⁸
- Objective : Immersion¹⁶³⁹
- Objective : NominalMagnification¹⁶⁴⁰
- ObjectiveSettings : ID¹⁶⁴¹
- Pixels : BigEndian¹⁶⁴²
- Pixels : DimensionOrder¹⁶⁴³
- Pixels : ID¹⁶⁴⁴
- Pixels : Interleaved¹⁶⁴⁵
- Pixels : PhysicalSizeX¹⁶⁴⁶
- Pixels : PhysicalSizeY¹⁶⁴⁷
- Pixels : PhysicalSizeZ¹⁶⁴⁸
- Pixels : SignificantBits¹⁶⁴⁹
- Pixels : SizeC¹⁶⁵⁰
- Pixels : SizeT¹⁶⁵¹
- Pixels : SizeX¹⁶⁵²
- Pixels : SizeY¹⁶⁵³
- Pixels : SizeZ¹⁶⁵⁴
- Pixels : Type¹⁶⁵⁵
- Plane : ExposureTime¹⁶⁵⁶
- Plane : PositionX¹⁶⁵⁷
- Plane : PositionY¹⁶⁵⁸
- Plane : PositionZ¹⁶⁵⁹
- Plane : TheC¹⁶⁶⁰

¹⁶³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁶³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁶³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

¹⁶³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁶³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

¹⁶⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹⁶⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁶⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁶⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁶⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁶⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁶⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁶⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁶⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹⁶⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁶⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁶⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁶⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁶⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁶⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁶⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁶⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹⁶⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹⁶⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹⁶⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

¹⁶⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

- Plane : TheT¹⁶⁶¹
- Plane : TheZ¹⁶⁶²

Total supported: 36

Total unknown or missing: 439

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁶⁶³](#) or the [previous versions¹⁶⁶⁴](#) page to find documentation for the version you are using.

18.2.37 GIFReader

This page lists supported metadata fields for the Bio-Formats Graphics Interchange Format format reader.

These fields are from the [OME data model¹⁶⁶⁵](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Graphics Interchange Format format reader:

- Channel : ID¹⁶⁶⁶
- Channel : SamplesPerPixel¹⁶⁶⁷
- Image : AcquisitionDate¹⁶⁶⁸
- Image : ID¹⁶⁶⁹
- Image : Name¹⁶⁷⁰
- Pixels : BigEndian¹⁶⁷¹
- Pixels : DimensionOrder¹⁶⁷²
- Pixels : ID¹⁶⁷³
- Pixels : Interleaved¹⁶⁷⁴
- Pixels : SignificantBits¹⁶⁷⁵
- Pixels : SizeC¹⁶⁷⁶
- Pixels : SizeT¹⁶⁷⁷

¹⁶⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁶⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁶⁶³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁶⁶⁴<http://www.openmicroscopy.org/site/support/legacy/>

¹⁶⁶⁵<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁶⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁶⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁶⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁶⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁶⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁶⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁶⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁶⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁶⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁶⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁶⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁶⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

- Pixels : SizeX¹⁶⁷⁸
- Pixels : SizeY¹⁶⁷⁹
- Pixels : SizeZ¹⁶⁸⁰
- Pixels : Type¹⁶⁸¹
- Plane : TheC¹⁶⁸²
- Plane : TheT¹⁶⁸³
- Plane : TheZ¹⁶⁸⁴

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁶⁸⁵](#) or the [previous versions¹⁶⁸⁶](#) page to find documentation for the version you are using.

18.2.38 NAFReader

This page lists supported metadata fields for the Bio-Formats Hamamatsu Aquacosmos format reader.

These fields are from the [OME data model¹⁶⁸⁷](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Hamamatsu Aquacosmos format reader:

- Channel : ID¹⁶⁸⁸
- Channel : SamplesPerPixel¹⁶⁸⁹
- Image : AcquisitionDate¹⁶⁹⁰
- Image : ID¹⁶⁹¹
- Image : Name¹⁶⁹²
- Pixels : BigEndian¹⁶⁹³
- Pixels : DimensionOrder¹⁶⁹⁴

¹⁶⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁶⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁶⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁶⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁶⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁶⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁶⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁶⁸⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁶⁸⁶<http://www.openmicroscopy.org/site/support/legacy/>

¹⁶⁸⁷<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁶⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁶⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁶⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁶⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁶⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁶⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁶⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID¹⁶⁹⁵
- Pixels : Interleaved¹⁶⁹⁶
- Pixels : SignificantBits¹⁶⁹⁷
- Pixels : SizeC¹⁶⁹⁸
- Pixels : SizeT¹⁶⁹⁹
- Pixels : SizeX¹⁷⁰⁰
- Pixels : SizeY¹⁷⁰¹
- Pixels : SizeZ¹⁷⁰²
- Pixels : Type¹⁷⁰³
- Plane : TheC¹⁷⁰⁴
- Plane : TheT¹⁷⁰⁵
- Plane : TheZ¹⁷⁰⁶

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁷⁰⁷](#) or the [previous versions¹⁷⁰⁸](#) page to find documentation for the version you are using.

18.2.39 HISReader

This page lists supported metadata fields for the Bio-Formats Hamamatsu HIS format reader.

These fields are from the [OME data model¹⁷⁰⁹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 27 of them (5%).
- Of those, Bio-Formats fully or partially converts 27 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Hamamatsu HIS format reader:

- Channel : ID¹⁷¹⁰
- Channel : SamplesPerPixel¹⁷¹¹

¹⁶⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁶⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁶⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁶⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁶⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁷⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁷⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁷⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁷⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁷⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁷⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁷⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁷⁰⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁷⁰⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁷⁰⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁷¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁷¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

- Detector : ID¹⁷¹²
- Detector : Offset¹⁷¹³
- Detector : Type¹⁷¹⁴
- DetectorSettings : Binning¹⁷¹⁵
- DetectorSettings : ID¹⁷¹⁶
- Image : AcquisitionDate¹⁷¹⁷
- Image : ID¹⁷¹⁸
- Image : InstrumentRef¹⁷¹⁹
- Image : Name¹⁷²⁰
- Instrument : ID¹⁷²¹
- Pixels : BigEndian¹⁷²²
- Pixels : DimensionOrder¹⁷²³
- Pixels : ID¹⁷²⁴
- Pixels : Interleaved¹⁷²⁵
- Pixels : SignificantBits¹⁷²⁶
- Pixels : SizeC¹⁷²⁷
- Pixels : SizeT¹⁷²⁸
- Pixels : SizeX¹⁷²⁹
- Pixels : SizeY¹⁷³⁰
- Pixels : SizeZ¹⁷³¹
- Pixels : Type¹⁷³²
- Plane : ExposureTime¹⁷³³
- Plane : TheC¹⁷³⁴
- Plane : TheT¹⁷³⁵
- Plane : TheZ¹⁷³⁶

- ¹⁷¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID
- ¹⁷¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset
- ¹⁷¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type
- ¹⁷¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning
- ¹⁷¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID
- ¹⁷¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate
- ¹⁷¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ¹⁷¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID
- ¹⁷²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ¹⁷²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID
- ¹⁷²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ¹⁷²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ¹⁷²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ¹⁷²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ¹⁷²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ¹⁷²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ¹⁷²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ¹⁷²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ¹⁷³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ¹⁷³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ¹⁷³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ¹⁷³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime
- ¹⁷³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ¹⁷³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ¹⁷³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

Total supported: 27

Total unknown or missing: 448

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁷³⁷ or the previous versions¹⁷³⁸ page to find documentation for the version you are using.

18.2.40 NDPIReader

This page lists supported metadata fields for the Bio-Formats Hamamatsu NDPI format reader.

These fields are from the OME data model¹⁷³⁹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 28 of them (5%).
- Of those, Bio-Formats fully or partially converts 28 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Hamamatsu NDPI format reader:

- Channel : ID¹⁷⁴⁰
- Channel : SamplesPerPixel¹⁷⁴¹
- Image : AcquisitionDate¹⁷⁴²
- Image : Description¹⁷⁴³
- Image : ID¹⁷⁴⁴
- Image : InstrumentRef¹⁷⁴⁵
- Image : Name¹⁷⁴⁶
- Instrument : ID¹⁷⁴⁷
- Microscope : Model¹⁷⁴⁸
- Objective : ID¹⁷⁴⁹
- Objective : NominalMagnification¹⁷⁵⁰
- ObjectiveSettings : ID¹⁷⁵¹
- Pixels : BigEndian¹⁷⁵²
- Pixels : DimensionOrder¹⁷⁵³

¹⁷³⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁷³⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁷³⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁷⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁷⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁷⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁷⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹⁷⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁷⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁷⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁷⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁷⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁷⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁷⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹⁷⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁷⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁷⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID¹⁷⁵⁴
- Pixels : Interleaved¹⁷⁵⁵
- Pixels : PhysicalSizeX¹⁷⁵⁶
- Pixels : PhysicalSizeY¹⁷⁵⁷
- Pixels : SignificantBits¹⁷⁵⁸
- Pixels : SizeC¹⁷⁵⁹
- Pixels : SizeT¹⁷⁶⁰
- Pixels : SizeX¹⁷⁶¹
- Pixels : SizeY¹⁷⁶²
- Pixels : SizeZ¹⁷⁶³
- Pixels : Type¹⁷⁶⁴
- Plane : TheC¹⁷⁶⁵
- Plane : TheT¹⁷⁶⁶
- Plane : TheZ¹⁷⁶⁷

Total supported: 28

Total unknown or missing: 447

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁷⁶⁸ or the previous versions¹⁷⁶⁹ page to find documentation for the version you are using.

18.2.41 HamamatsuVMSReader

This page lists supported metadata fields for the Bio-Formats Hamamatsu VMS format reader.

These fields are from the OME data model¹⁷⁷⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 26 of them (5%).
- Of those, Bio-Formats fully or partially converts 26 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Hamamatsu VMS format reader:

¹⁷⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁷⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁷⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁷⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁷⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁷⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁷⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁷⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁷⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁷⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁷⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁷⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁷⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁷⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁷⁶⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁷⁶⁹<http://www.openmicroscopy.org/site/support/legacy/>

¹⁷⁷⁰<http://www.openmicroscopy.org/site/support/ome-model/>

- Channel : ID¹⁷⁷¹
- Channel : SamplesPerPixel¹⁷⁷²
- Image : AcquisitionDate¹⁷⁷³
- Image : ID¹⁷⁷⁴
- Image : InstrumentRef¹⁷⁷⁵
- Image : Name¹⁷⁷⁶
- Instrument : ID¹⁷⁷⁷
- Objective : ID¹⁷⁷⁸
- Objective : NominalMagnification¹⁷⁷⁹
- ObjectiveSettings : ID¹⁷⁸⁰
- Pixels : BigEndian¹⁷⁸¹
- Pixels : DimensionOrder¹⁷⁸²
- Pixels : ID¹⁷⁸³
- Pixels : Interleaved¹⁷⁸⁴
- Pixels : PhysicalSizeX¹⁷⁸⁵
- Pixels : PhysicalSizeY¹⁷⁸⁶
- Pixels : SignificantBits¹⁷⁸⁷
- Pixels : SizeC¹⁷⁸⁸
- Pixels : SizeT¹⁷⁸⁹
- Pixels : SizeX¹⁷⁹⁰
- Pixels : SizeY¹⁷⁹¹
- Pixels : SizeZ¹⁷⁹²
- Pixels : Type¹⁷⁹³
- Plane : TheC¹⁷⁹⁴
- Plane : TheT¹⁷⁹⁵
- Plane : TheZ¹⁷⁹⁶

¹⁷⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁷⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁷⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁷⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁷⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁷⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁷⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁷⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁷⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹⁷⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁷⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁷⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁷⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁷⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁷⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁷⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁷⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁷⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁷⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁷⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁷⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁷⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁷⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁷⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁷⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁷⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

Total supported: 26

Total unknown or missing: 449

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁷⁹⁷](#) or the [previous versions¹⁷⁹⁸](#) page to find documentation for the version you are using.

18.2.42 HitachiReader

This page lists supported metadata fields for the Bio-Formats Hitachi format reader.

These fields are from the [OME data model¹⁷⁹⁹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 31 of them (6%).
- Of those, Bio-Formats fully or partially converts 31 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Hitachi format reader:

- Channel : ID¹⁸⁰⁰
- Channel : SamplesPerPixel¹⁸⁰¹
- Image : AcquisitionDate¹⁸⁰²
- Image : ID¹⁸⁰³
- Image : InstrumentRef¹⁸⁰⁴
- Image : Name¹⁸⁰⁵
- Instrument : ID¹⁸⁰⁶
- Microscope : Model¹⁸⁰⁷
- Microscope : SerialNumber¹⁸⁰⁸
- Objective : ID¹⁸⁰⁹
- Objective : WorkingDistance¹⁸¹⁰
- ObjectiveSettings : ID¹⁸¹¹
- Pixels : BigEndian¹⁸¹²
- Pixels : DimensionOrder¹⁸¹³

¹⁷⁹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁷⁹⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁷⁹⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁸⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁸⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁸⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁸⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁸⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁸⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁸⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁸⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

¹⁸⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁸¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

¹⁸¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁸¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁸¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID¹⁸¹⁴
- Pixels : Interleaved¹⁸¹⁵
- Pixels : PhysicalSizeX¹⁸¹⁶
- Pixels : PhysicalSizeY¹⁸¹⁷
- Pixels : SignificantBits¹⁸¹⁸
- Pixels : SizeC¹⁸¹⁹
- Pixels : SizeT¹⁸²⁰
- Pixels : SizeX¹⁸²¹
- Pixels : SizeY¹⁸²²
- Pixels : SizeZ¹⁸²³
- Pixels : Type¹⁸²⁴
- Plane : PositionX¹⁸²⁵
- Plane : PositionY¹⁸²⁶
- Plane : PositionZ¹⁸²⁷
- Plane : TheC¹⁸²⁸
- Plane : TheT¹⁸²⁹
- Plane : TheZ¹⁸³⁰

Total supported: 31

Total unknown or missing: 444

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁸³¹ or the previous versions¹⁸³² page to find documentation for the version you are using.

18.2.43 I2IReader

This page lists supported metadata fields for the Bio-Formats I2I format reader.

These fields are from the OME data model¹⁸³³. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).

¹⁸¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁸¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁸¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁸¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁸¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁸¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁸²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁸²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁸²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁸²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁸²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁸²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹⁸²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹⁸²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

¹⁸²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁸²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁸³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁸³¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁸³²<http://www.openmicroscopy.org/site/support/legacy/>

¹⁸³³<http://www.openmicroscopy.org/site/support/ome-model/>

- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats I2I format reader:

- Channel : ID¹⁸³⁴
- Channel : SamplesPerPixel¹⁸³⁵
- Image : AcquisitionDate¹⁸³⁶
- Image : ID¹⁸³⁷
- Image : Name¹⁸³⁸
- Pixels : BigEndian¹⁸³⁹
- Pixels : DimensionOrder¹⁸⁴⁰
- Pixels : ID¹⁸⁴¹
- Pixels : Interleaved¹⁸⁴²
- Pixels : SignificantBits¹⁸⁴³
- Pixels : SizeC¹⁸⁴⁴
- Pixels : SizeT¹⁸⁴⁵
- Pixels : SizeX¹⁸⁴⁶
- Pixels : SizeY¹⁸⁴⁷
- Pixels : SizeZ¹⁸⁴⁸
- Pixels : Type¹⁸⁴⁹
- Plane : TheC¹⁸⁵⁰
- Plane : TheT¹⁸⁵¹
- Plane : TheZ¹⁸⁵²

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁸⁵³ or the previous versions¹⁸⁵⁴ page to find documentation for the version you are using.

¹⁸³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁸³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁸³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁸³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁸³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁸³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁸⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁸⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁸⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁸⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁸⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁸⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁸⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁸⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁸⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁸⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁸⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁸⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁸⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁸⁵³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁸⁵⁴<http://www.openmicroscopy.org/site/support/legacy/>

18.2.44 ICSReader

This page lists supported metadata fields for the Bio-Formats Image Cytometry Standard format reader.

These fields are from the [OME data model](#)¹⁸⁵⁵. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 72 of them (15%).
- Of those, Bio-Formats fully or partially converts 72 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Image Cytometry Standard format reader:

- Channel : EmissionWavelength¹⁸⁵⁶
- Channel : ExcitationWavelength¹⁸⁵⁷
- Channel : ID¹⁸⁵⁸
- Channel : Name¹⁸⁵⁹
- Channel : PinholeSize¹⁸⁶⁰
- Channel : SamplesPerPixel¹⁸⁶¹
- Detector : ID¹⁸⁶²
- Detector : Manufacturer¹⁸⁶³
- Detector : Model¹⁸⁶⁴
- Detector : Type¹⁸⁶⁵
- DetectorSettings : Gain¹⁸⁶⁶
- DetectorSettings : ID¹⁸⁶⁷
- Dichroic : ID¹⁸⁶⁸
- Dichroic : Model¹⁸⁶⁹
- Experiment : ID¹⁸⁷⁰
- Experiment : Type¹⁸⁷¹
- Experimenter : ID¹⁸⁷²
- Experimenter : LastName¹⁸⁷³

¹⁸⁵⁵<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁸⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

¹⁸⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

¹⁸⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁸⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

¹⁸⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

¹⁸⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁸⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁸⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

¹⁸⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹⁸⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

¹⁸⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹⁸⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

¹⁸⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID

¹⁸⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type

¹⁸⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

¹⁸⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

- Filter : ID¹⁸⁷⁴
- Filter : Model¹⁸⁷⁵
- FilterSet : DichroicRef¹⁸⁷⁶
- FilterSet : EmissionFilterRef¹⁸⁷⁷
- FilterSet : ExcitationFilterRef¹⁸⁷⁸
- FilterSet : ID¹⁸⁷⁹
- FilterSet : Model¹⁸⁸⁰
- Image : AcquisitionDate¹⁸⁸¹
- Image : Description¹⁸⁸²
- Image : ID¹⁸⁸³
- Image : InstrumentRef¹⁸⁸⁴
- Image : Name¹⁸⁸⁵
- Instrument : ID¹⁸⁸⁶
- Laser : ID¹⁸⁸⁷
- Laser : LaserMedium¹⁸⁸⁸
- Laser : Manufacturer¹⁸⁸⁹
- Laser : Model¹⁸⁹⁰
- Laser : Power¹⁸⁹¹
- Laser : RepetitionRate¹⁸⁹²
- Laser : Type¹⁸⁹³
- Laser : Wavelength¹⁸⁹⁴
- Microscope : Manufacturer¹⁸⁹⁵
- Microscope : Model¹⁸⁹⁶
- Objective : CalibratedMagnification¹⁸⁹⁷
- Objective : Correction¹⁸⁹⁸
- Objective : ID¹⁸⁹⁹

¹⁸⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

¹⁸⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID

¹⁸⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

¹⁸⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

¹⁸⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterSet_ID

¹⁸⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁸⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹⁸⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁸⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁸⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁸⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁸⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

¹⁸⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

¹⁸⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

¹⁸⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

¹⁸⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_RepetitionRate

¹⁸⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

¹⁸⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

¹⁸⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

¹⁸⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

¹⁸⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

¹⁸⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

- Objective : Immersion¹⁹⁰⁰
- Objective : LensNA¹⁹⁰¹
- Objective : Model¹⁹⁰²
- Objective : WorkingDistance¹⁹⁰³
- ObjectiveSettings : ID¹⁹⁰⁴
- Pixels : BigEndian¹⁹⁰⁵
- Pixels : DimensionOrder¹⁹⁰⁶
- Pixels : ID¹⁹⁰⁷
- Pixels : Interleaved¹⁹⁰⁸
- Pixels : PhysicalSizeX¹⁹⁰⁹
- Pixels : PhysicalSizeY¹⁹¹⁰
- Pixels : PhysicalSizeZ¹⁹¹¹
- Pixels : SignificantBits¹⁹¹²
- Pixels : SizeC¹⁹¹³
- Pixels : SizeT¹⁹¹⁴
- Pixels : SizeX¹⁹¹⁵
- Pixels : SizeY¹⁹¹⁶
- Pixels : SizeZ¹⁹¹⁷
- Pixels : TimeIncrement¹⁹¹⁸
- Pixels : Type¹⁹¹⁹
- Plane : DeltaT¹⁹²⁰
- Plane : ExposureTime¹⁹²¹
- Plane : PositionX¹⁹²²
- Plane : PositionY¹⁹²³
- Plane : PositionZ¹⁹²⁴
- Plane : TheC¹⁹²⁵

¹⁹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

¹⁹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

¹⁹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

¹⁹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹⁹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

¹⁹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

¹⁹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹⁹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹⁹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹⁹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

¹⁹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

- Plane : TheT¹⁹²⁶
- Plane : TheZ¹⁹²⁷

Total supported: 72

Total unknown or missing: 403

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁹²⁸](#) or the [previous versions¹⁹²⁹](#) page to find documentation for the version you are using.

18.2.45 ImaconReader

This page lists supported metadata fields for the Bio-Formats Imacon format reader.

These fields are from the [OME data model¹⁹³⁰](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 23 of them (4%).
- Of those, Bio-Formats fully or partially converts 23 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Imacon format reader:

- Channel : ID¹⁹³¹
- Channel : SamplesPerPixel¹⁹³²
- Experimenter : FirstName¹⁹³³
- Experimenter : ID¹⁹³⁴
- Experimenter : LastName¹⁹³⁵
- Image : AcquisitionDate¹⁹³⁶
- Image : ExperimenterRef¹⁹³⁷
- Image : ID¹⁹³⁸
- Image : Name¹⁹³⁹
- Pixels : BigEndian¹⁹⁴⁰
- Pixels : DimensionOrder¹⁹⁴¹
- Pixels : ID¹⁹⁴²

¹⁹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁹²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹²⁹<http://www.openmicroscopy.org/site/support/legacy/>

¹⁹³⁰<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_FirstName

¹⁹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

¹⁹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

¹⁹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID

¹⁹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

- Pixels : Interleaved¹⁹⁴³
- Pixels : SignificantBits¹⁹⁴⁴
- Pixels : SizeC¹⁹⁴⁵
- Pixels : SizeT¹⁹⁴⁶
- Pixels : SizeX¹⁹⁴⁷
- Pixels : SizeY¹⁹⁴⁸
- Pixels : SizeZ¹⁹⁴⁹
- Pixels : Type¹⁹⁵⁰
- Plane : TheC¹⁹⁵¹
- Plane : TheT¹⁹⁵²
- Plane : TheZ¹⁹⁵³

Total supported: 23

Total unknown or missing: 452

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version¹⁹⁵⁴](#) or the [previous versions¹⁹⁵⁵](#) page to find documentation for the version you are using.

18.2.46 SEQReader

This page lists supported metadata fields for the Bio-Formats Image-Pro Sequence format reader.

These fields are from the [OME data model¹⁹⁵⁶](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Image-Pro Sequence format reader:

- Channel : ID¹⁹⁵⁷
- Channel : SamplesPerPixel¹⁹⁵⁸
- Image : AcquisitionDate¹⁹⁵⁹

¹⁹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁹⁵⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹⁵⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹⁹⁵⁶<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID¹⁹⁶⁰
- Image : Name¹⁹⁶¹
- Pixels : BigEndian¹⁹⁶²
- Pixels : DimensionOrder¹⁹⁶³
- Pixels : ID¹⁹⁶⁴
- Pixels : Interleaved¹⁹⁶⁵
- Pixels : SignificantBits¹⁹⁶⁶
- Pixels : SizeC¹⁹⁶⁷
- Pixels : SizeT¹⁹⁶⁸
- Pixels : SizeX¹⁹⁶⁹
- Pixels : SizeY¹⁹⁷⁰
- Pixels : SizeZ¹⁹⁷¹
- Pixels : Type¹⁹⁷²
- Plane : TheC¹⁹⁷³
- Plane : TheT¹⁹⁷⁴
- Plane : TheZ¹⁹⁷⁵

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁹⁷⁶ or the previous versions¹⁹⁷⁷ page to find documentation for the version you are using.

18.2.47 IPWReader

This page lists supported metadata fields for the Bio-Formats Image-Pro Workspace format reader.

These fields are from the OME data model¹⁹⁷⁸. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 20 of them (4%).
- Of those, Bio-Formats fully or partially converts 20 (100%).

¹⁹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁹⁷⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹⁷⁷<http://www.openmicroscopy.org/site/support/legacy/>

¹⁹⁷⁸<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Image-Pro Workspace format reader:

- Channel : ID¹⁹⁷⁹
- Channel : SamplesPerPixel¹⁹⁸⁰
- Image : AcquisitionDate¹⁹⁸¹
- Image : Description¹⁹⁸²
- Image : ID¹⁹⁸³
- Image : Name¹⁹⁸⁴
- Pixels : BigEndian¹⁹⁸⁵
- Pixels : DimensionOrder¹⁹⁸⁶
- Pixels : ID¹⁹⁸⁷
- Pixels : Interleaved¹⁹⁸⁸
- Pixels : SignificantBits¹⁹⁸⁹
- Pixels : SizeC¹⁹⁹⁰
- Pixels : SizeT¹⁹⁹¹
- Pixels : SizeX¹⁹⁹²
- Pixels : SizeY¹⁹⁹³
- Pixels : SizeZ¹⁹⁹⁴
- Pixels : Type¹⁹⁹⁵
- Plane : TheC¹⁹⁹⁶
- Plane : TheT¹⁹⁹⁷
- Plane : TheZ¹⁹⁹⁸

Total supported: 20

Total unknown or missing: 455

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version¹⁹⁹⁹ or the previous versions²⁰⁰⁰ page to find documentation for the version you are using.

¹⁹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹⁹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁹⁹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁰⁰⁰<http://www.openmicroscopy.org/site/support/legacy/>

18.2.48 ImagicReader

This page lists supported metadata fields for the Bio-Formats IMAGIC format reader.

These fields are from the [OME data model](#)²⁰⁰¹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats IMAGIC format reader:

- Channel : ID²⁰⁰²
- Channel : SamplesPerPixel²⁰⁰³
- Image : AcquisitionDate²⁰⁰⁴
- Image : ID²⁰⁰⁵
- Image : Name²⁰⁰⁶
- Pixels : BigEndian²⁰⁰⁷
- Pixels : DimensionOrder²⁰⁰⁸
- Pixels : ID²⁰⁰⁹
- Pixels : Interleaved²⁰¹⁰
- Pixels : PhysicalSizeX²⁰¹¹
- Pixels : PhysicalSizeY²⁰¹²
- Pixels : PhysicalSizeZ²⁰¹³
- Pixels : SignificantBits²⁰¹⁴
- Pixels : SizeC²⁰¹⁵
- Pixels : SizeT²⁰¹⁶
- Pixels : SizeX²⁰¹⁷
- Pixels : SizeY²⁰¹⁸
- Pixels : SizeZ²⁰¹⁹
- Pixels : Type²⁰²⁰

²⁰⁰¹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁰⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁰⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁰⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁰⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁰⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁰⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁰⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁰⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁰¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁰¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁰¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁰¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²⁰¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁰¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁰¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁰¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁰¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁰¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁰²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC²⁰²¹
- Plane : TheT²⁰²²
- Plane : TheZ²⁰²³

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁰²⁴](#) or the [previous versions²⁰²⁵](#) page to find documentation for the version you are using.

18.2.49 IMODReader

This page lists supported metadata fields for the Bio-Formats IMOD format reader.

These fields are from the [OME data model²⁰²⁶](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 44 of them (9%).
- Of those, Bio-Formats fully or partially converts 44 (100%).

Supported fields

These fields are fully supported by the Bio-Formats IMOD format reader:

- Channel : ID²⁰²⁷
- Channel : SamplesPerPixel²⁰²⁸
- Image : AcquisitionDate²⁰²⁹
- Image : ID²⁰³⁰
- Image : Name²⁰³¹
- Image : ROIRef²⁰³²
- Pixels : BigEndian²⁰³³
- Pixels : DimensionOrder²⁰³⁴
- Pixels : ID²⁰³⁵
- Pixels : Interleaved²⁰³⁶
- Pixels : PhysicalSizeX²⁰³⁷

²⁰²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁰²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁰²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁰²⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁰²⁵<http://www.openmicroscopy.org/site/support/legacy/>

²⁰²⁶<http://www.openmicroscopy.org/site/support/ome-model/>

²⁰²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁰²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁰²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁰³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁰³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁰³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

²⁰³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁰³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁰³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁰³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁰³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

- Pixels : PhysicalSizeY²⁰³⁸
- Pixels : PhysicalSizeZ²⁰³⁹
- Pixels : SignificantBits²⁰⁴⁰
- Pixels : SizeC²⁰⁴¹
- Pixels : SizeT²⁰⁴²
- Pixels : SizeX²⁰⁴³
- Pixels : SizeY²⁰⁴⁴
- Pixels : SizeZ²⁰⁴⁵
- Pixels : Type²⁰⁴⁶
- Plane : TheC²⁰⁴⁷
- Plane : TheT²⁰⁴⁸
- Plane : TheZ²⁰⁴⁹
- Point : ID²⁰⁵⁰
- Point : StrokeColor²⁰⁵¹
- Point : StrokeDashArray²⁰⁵²
- Point : StrokeWidth²⁰⁵³
- Point : TheZ²⁰⁵⁴
- Point : X²⁰⁵⁵
- Point : Y²⁰⁵⁶
- Polygon : ID²⁰⁵⁷
- Polygon : Points²⁰⁵⁸
- Polygon : StrokeColor²⁰⁵⁹
- Polygon : StrokeDashArray²⁰⁶⁰
- Polygon : StrokeWidth²⁰⁶¹
- Polygon : TheZ²⁰⁶²
- Polyline : ID²⁰⁶³

²⁰³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁰³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²⁰⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁰⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁰⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁰⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁰⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁰⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁰⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁰⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁰⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁰⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁰⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁰⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

²⁰⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray

²⁰⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

²⁰⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

²⁰⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_X

²⁰⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_Y

²⁰⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁰⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

²⁰⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

²⁰⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray

²⁰⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

²⁰⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

²⁰⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

- Polyline : Points²⁰⁶⁴
- Polyline : StrokeColor²⁰⁶⁵
- Polyline : StrokeDashArray²⁰⁶⁶
- Polyline : StrokeWidth²⁰⁶⁷
- Polyline : TheZ²⁰⁶⁸
- ROI : ID²⁰⁶⁹
- ROI : Name²⁰⁷⁰

Total supported: 44

Total unknown or missing: 431

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁰⁷¹](#) or the [previous versions²⁰⁷²](#) page to find documentation for the version you are using.

18.2.50 OpenlabReader

This page lists supported metadata fields for the Bio-Formats Openlab LIFF format reader.

These fields are from the [OME data model²⁰⁷³](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 32 of them (6%).
- Of those, Bio-Formats fully or partially converts 32 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Openlab LIFF format reader:

- Channel : ID²⁰⁷⁴
- Channel : Name²⁰⁷⁵
- Channel : SamplesPerPixel²⁰⁷⁶
- Detector : ID²⁰⁷⁷
- Detector : Type²⁰⁷⁸
- DetectorSettings : Gain²⁰⁷⁹
- DetectorSettings : ID²⁰⁸⁰

²⁰⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polyline_Points

²⁰⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

²⁰⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray

²⁰⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

²⁰⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

²⁰⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

²⁰⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Name

²⁰⁷¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁰⁷²<http://www.openmicroscopy.org/site/support/legacy/>

²⁰⁷³<http://www.openmicroscopy.org/site/support/ome-model/>

²⁰⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁰⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁰⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁰⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²⁰⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²⁰⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

²⁰⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

- `DetectorSettings : Offset`²⁰⁸¹
- `Image : AcquisitionDate`²⁰⁸²
- `Image : ID`²⁰⁸³
- `Image : InstrumentRef`²⁰⁸⁴
- `Image : Name`²⁰⁸⁵
- `Instrument : ID`²⁰⁸⁶
- `Pixels : BigEndian`²⁰⁸⁷
- `Pixels : DimensionOrder`²⁰⁸⁸
- `Pixels : ID`²⁰⁸⁹
- `Pixels : Interleaved`²⁰⁹⁰
- `Pixels : PhysicalSizeX`²⁰⁹¹
- `Pixels : PhysicalSizeY`²⁰⁹²
- `Pixels : SignificantBits`²⁰⁹³
- `Pixels : SizeC`²⁰⁹⁴
- `Pixels : SizeT`²⁰⁹⁵
- `Pixels : SizeX`²⁰⁹⁶
- `Pixels : SizeY`²⁰⁹⁷
- `Pixels : SizeZ`²⁰⁹⁸
- `Pixels : Type`²⁰⁹⁹
- `Plane : PositionX`²¹⁰⁰
- `Plane : PositionY`²¹⁰¹
- `Plane : PositionZ`²¹⁰²
- `Plane : TheC`²¹⁰³
- `Plane : TheT`²¹⁰⁴
- `Plane : TheZ`²¹⁰⁵

²⁰⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

²⁰⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁰⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁰⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁰⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁰⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁰⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁰⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁰⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁰⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁰⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁰⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁰⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁰⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁰⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁰⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁰⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁰⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁰⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²¹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²¹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²¹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

²¹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²¹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²¹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

Total supported: 32

Total unknown or missing: 443

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²¹⁰⁶](#) or the [previous versions²¹⁰⁷](#) page to find documentation for the version you are using.

18.2.51 OpenlabRawReader

This page lists supported metadata fields for the Bio-Formats Openlab RAW format reader.

These fields are from the [OME data model²¹⁰⁸](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Openlab RAW format reader:

- Channel : ID²¹⁰⁹
- Channel : SamplesPerPixel²¹¹⁰
- Image : AcquisitionDate²¹¹¹
- Image : ID²¹¹²
- Image : Name²¹¹³
- Pixels : BigEndian²¹¹⁴
- Pixels : DimensionOrder²¹¹⁵
- Pixels : ID²¹¹⁶
- Pixels : Interleaved²¹¹⁷
- Pixels : SignificantBits²¹¹⁸
- Pixels : SizeC²¹¹⁹
- Pixels : SizeT²¹²⁰
- Pixels : SizeX²¹²¹
- Pixels : SizeY²¹²²

²¹⁰⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²¹⁰⁷<http://www.openmicroscopy.org/site/support/legacy/>

²¹⁰⁸<http://www.openmicroscopy.org/site/support/ome-model/>

²¹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²¹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²¹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²¹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²¹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²¹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²¹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²¹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²¹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²¹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²¹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²¹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²¹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²¹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ²¹²³
- Pixels : Type²¹²⁴
- Plane : TheC²¹²⁵
- Plane : TheT²¹²⁶
- Plane : TheZ²¹²⁷

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²¹²⁸](#) or the [previous versions²¹²⁹](#) page to find documentation for the version you are using.

18.2.52 ImprovionTiffReader

This page lists supported metadata fields for the Bio-Formats Improvion TIFF format reader.

These fields are from the [OME data model²¹³⁰](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 25 of them (5%).
- Of those, Bio-Formats fully or partially converts 25 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Improvion TIFF format reader:

- Channel : ID²¹³¹
- Channel : Name²¹³²
- Channel : SamplesPerPixel²¹³³
- Image : AcquisitionDate²¹³⁴
- Image : Description²¹³⁵
- Image : ID²¹³⁶
- Image : Name²¹³⁷
- Pixels : BigEndian²¹³⁸
- Pixels : DimensionOrder²¹³⁹

²¹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²¹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²¹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²¹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²¹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²¹²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²¹²⁹<http://www.openmicroscopy.org/site/support/legacy/>

²¹³⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²¹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²¹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²¹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²¹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²¹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²¹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²¹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²¹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²¹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID²¹⁴⁰
- Pixels : Interleaved²¹⁴¹
- Pixels : PhysicalSizeX²¹⁴²
- Pixels : PhysicalSizeY²¹⁴³
- Pixels : PhysicalSizeZ²¹⁴⁴
- Pixels : SignificantBits²¹⁴⁵
- Pixels : SizeC²¹⁴⁶
- Pixels : SizeT²¹⁴⁷
- Pixels : SizeX²¹⁴⁸
- Pixels : SizeY²¹⁴⁹
- Pixels : SizeZ²¹⁵⁰
- Pixels : TimeIncrement²¹⁵¹
- Pixels : Type²¹⁵²
- Plane : TheC²¹⁵³
- Plane : TheT²¹⁵⁴
- Plane : TheZ²¹⁵⁵

Total supported: 25

Total unknown or missing: 450

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²¹⁵⁶ or the previous versions²¹⁵⁷ page to find documentation for the version you are using.

18.2.53 OBFReader

This page lists supported metadata fields for the Bio-Formats OBF format reader.

These fields are from the OME data model²¹⁵⁸. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

²¹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²¹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²¹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²¹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²¹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²¹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²¹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²¹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²¹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²¹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²¹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²¹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

²¹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²¹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²¹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²¹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²¹⁵⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²¹⁵⁷<http://www.openmicroscopy.org/site/support/legacy/>

²¹⁵⁸<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats OBF format reader:

- Channel : ID²¹⁵⁹
- Channel : SamplesPerPixel²¹⁶⁰
- Image : AcquisitionDate²¹⁶¹
- Image : ID²¹⁶²
- Image : Name²¹⁶³
- Pixels : BigEndian²¹⁶⁴
- Pixels : DimensionOrder²¹⁶⁵
- Pixels : ID²¹⁶⁶
- Pixels : Interleaved²¹⁶⁷
- Pixels : SignificantBits²¹⁶⁸
- Pixels : SizeC²¹⁶⁹
- Pixels : SizeT²¹⁷⁰
- Pixels : SizeX²¹⁷¹
- Pixels : SizeY²¹⁷²
- Pixels : SizeZ²¹⁷³
- Pixels : Type²¹⁷⁴
- Plane : TheC²¹⁷⁵
- Plane : TheT²¹⁷⁶
- Plane : TheZ²¹⁷⁷

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²¹⁷⁸ or the previous versions²¹⁷⁹ page to find documentation for the version you are using.

²¹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²¹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²¹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²¹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²¹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²¹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²¹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²¹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²¹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²¹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²¹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²¹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²¹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²¹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²¹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²¹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²¹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²¹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²¹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²¹⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²¹⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.54 InCellReader

This page lists supported metadata fields for the Bio-Formats InCell 1000/2000 format reader.

These fields are from the [OME data model](#)²¹⁸⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 67 of them (14%).
- Of those, Bio-Formats fully or partially converts 67 (100%).

Supported fields

These fields are fully supported by the Bio-Formats InCell 1000/2000 format reader:

- Channel : EmissionWavelength²¹⁸¹
- Channel : ExcitationWavelength²¹⁸²
- Channel : ID²¹⁸³
- Channel : Name²¹⁸⁴
- Channel : SamplesPerPixel²¹⁸⁵
- Detector : ID²¹⁸⁶
- Detector : Model²¹⁸⁷
- Detector : Type²¹⁸⁸
- DetectorSettings : Binning²¹⁸⁹
- DetectorSettings : Gain²¹⁹⁰
- DetectorSettings : ID²¹⁹¹
- Experiment : ID²¹⁹²
- Experiment : Type²¹⁹³
- Image : AcquisitionDate²¹⁹⁴
- Image : Description²¹⁹⁵
- Image : ExperimentRef²¹⁹⁶
- Image : ID²¹⁹⁷
- Image : InstrumentRef²¹⁹⁸
- Image : Name²¹⁹⁹

²¹⁸⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²¹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

²¹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

²¹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²¹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²¹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²¹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²¹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²¹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²¹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

²¹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

²¹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²¹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID

²¹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type

²¹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²¹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²¹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimentRef_ID

²¹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²¹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²¹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

- `ImagingEnvironment : Temperature`²²⁰⁰
- `Instrument : ID`²²⁰¹
- `Objective : Correction`²²⁰²
- `Objective : ID`²²⁰³
- `Objective : Immersion`²²⁰⁴
- `Objective : LensNA`²²⁰⁵
- `Objective : Manufacturer`²²⁰⁶
- `Objective : NominalMagnification`²²⁰⁷
- `ObjectiveSettings : ID`²²⁰⁸
- `ObjectiveSettings : RefractiveIndex`²²⁰⁹
- `Pixels : BigEndian`²²¹⁰
- `Pixels : DimensionOrder`²²¹¹
- `Pixels : ID`²²¹²
- `Pixels : Interleaved`²²¹³
- `Pixels : PhysicalSizeX`²²¹⁴
- `Pixels : PhysicalSizeY`²²¹⁵
- `Pixels : SignificantBits`²²¹⁶
- `Pixels : SizeC`²²¹⁷
- `Pixels : SizeT`²²¹⁸
- `Pixels : SizeX`²²¹⁹
- `Pixels : SizeY`²²²⁰
- `Pixels : SizeZ`²²²¹
- `Pixels : Type`²²²²
- `Plane : DeltaT`²²²³
- `Plane : ExposureTime`²²²⁴
- `Plane : PositionX`²²²⁵

²²⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

²²⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²²⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

²²⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²²⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

²²⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²²⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

²²⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

²²⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

²²⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

²²¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²²¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²²¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²²¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²²¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²²¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²²¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²²¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²²¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²²¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²²²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²²²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²²²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²²²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²²²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²²²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

- Plane : PositionY²²²⁶
- Plane : PositionZ²²²⁷
- Plane : TheC²²²⁸
- Plane : TheT²²²⁹
- Plane : TheZ²²³⁰
- Plate : ColumnNamingConvention²²³¹
- Plate : ID²²³²
- Plate : Name²²³³
- Plate : RowNamingConvention²²³⁴
- Plate : WellOriginX²²³⁵
- Plate : WellOriginY²²³⁶
- PlateAcquisition : ID²²³⁷
- PlateAcquisition : MaximumFieldCount²²³⁸
- PlateAcquisition : WellSampleRef²²³⁹
- Well : Column²²⁴⁰
- Well : ID²²⁴¹
- Well : Row²²⁴²
- WellSample : ID²²⁴³
- WellSample : ImageRef²²⁴⁴
- WellSample : Index²²⁴⁵
- WellSample : PositionX²²⁴⁶
- WellSample : PositionY²²⁴⁷

Total supported: 67

Total unknown or missing: 408

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²²⁴⁸ or the previous versions²²⁴⁹ page to find documentation for the version you are using.

²²²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²²²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

²²²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²²²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²²³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²²³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

²²³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

²²³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

²²³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

²²³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_WellOriginX

²²³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_WellOriginY

²²³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

²²³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

²²³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

²²⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

²²⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

²²⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

²²⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

²²⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

²²⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

²²⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

²²⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

²²⁴⁸<http://www.openmicroscopy.org/site/support/bio-formats-5.0/>

²²⁴⁹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.55 InCell3000Reader

This page lists supported metadata fields for the Bio-Formats InCell 3000 format reader.

These fields are from the [OME data model](#)²²⁵⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats InCell 3000 format reader:

- Channel : ID²²⁵¹
- Channel : SamplesPerPixel²²⁵²
- Image : AcquisitionDate²²⁵³
- Image : ID²²⁵⁴
- Image : Name²²⁵⁵
- Pixels : BigEndian²²⁵⁶
- Pixels : DimensionOrder²²⁵⁷
- Pixels : ID²²⁵⁸
- Pixels : Interleaved²²⁵⁹
- Pixels : SignificantBits²²⁶⁰
- Pixels : SizeC²²⁶¹
- Pixels : SizeT²²⁶²
- Pixels : SizeX²²⁶³
- Pixels : SizeY²²⁶⁴
- Pixels : SizeZ²²⁶⁵
- Pixels : Type²²⁶⁶
- Plane : TheC²²⁶⁷
- Plane : TheT²²⁶⁸

²²⁵⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²²⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²²⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²²⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²²⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²²⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²²⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²²⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²²⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²²⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²²⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²²⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²²⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²²⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²²⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²²⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²²⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²²⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²²⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ²²⁶⁹

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²²⁷⁰](#) or the [previous versions²²⁷¹](#) page to find documentation for the version you are using.

18.2.56 INRReader

This page lists supported metadata fields for the Bio-Formats INR format reader.

These fields are from the [OME data model²²⁷²](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats INR format reader:

- Channel : ID²²⁷³
- Channel : SamplesPerPixel²²⁷⁴
- Image : AcquisitionDate²²⁷⁵
- Image : ID²²⁷⁶
- Image : Name²²⁷⁷
- Pixels : BigEndian²²⁷⁸
- Pixels : DimensionOrder²²⁷⁹
- Pixels : ID²²⁸⁰
- Pixels : Interleaved²²⁸¹
- Pixels : PhysicalSizeX²²⁸²
- Pixels : PhysicalSizeY²²⁸³
- Pixels : PhysicalSizeZ²²⁸⁴
- Pixels : SignificantBits²²⁸⁵

²²⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²²⁷⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²²⁷¹<http://www.openmicroscopy.org/site/support/legacy/>

²²⁷²<http://www.openmicroscopy.org/site/support/ome-model/>

²²⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²²⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²²⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²²⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²²⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²²⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²²⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²²⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²²⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²²⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²²⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²²⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²²⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

- Pixels : SizeC²²⁸⁶
- Pixels : SizeT²²⁸⁷
- Pixels : SizeX²²⁸⁸
- Pixels : SizeY²²⁸⁹
- Pixels : SizeZ²²⁹⁰
- Pixels : Type²²⁹¹
- Plane : TheC²²⁹²
- Plane : TheT²²⁹³
- Plane : TheZ²²⁹⁴

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²²⁹⁵](#) or the [previous versions²²⁹⁶](#) page to find documentation for the version you are using.

18.2.57 InveonReader

This page lists supported metadata fields for the Bio-Formats Inveon format reader.

These fields are from the [OME data model²²⁹⁷](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 30 of them (6%).
- Of those, Bio-Formats fully or partially converts 30 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Inveon format reader:

- Channel : ID²²⁹⁸
- Channel : SamplesPerPixel²²⁹⁹
- Experimenter : ID²³⁰⁰
- Experimenter : Institution²³⁰¹
- Experimenter : UserName²³⁰²

²²⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²²⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²²⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²²⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²²⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²²⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²²⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²²⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²²⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²²⁹⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²²⁹⁶<http://www.openmicroscopy.org/site/support/legacy/>

²²⁹⁷<http://www.openmicroscopy.org/site/support/ome-model/>

²²⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²²⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²³⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

²³⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_Institution

²³⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_UserName

- Image : AcquisitionDate²³⁰³
- Image : Description²³⁰⁴
- Image : ExperimenterRef²³⁰⁵
- Image : ID²³⁰⁶
- Image : InstrumentRef²³⁰⁷
- Image : Name²³⁰⁸
- Instrument : ID²³⁰⁹
- Microscope : Model²³¹⁰
- Pixels : BigEndian²³¹¹
- Pixels : DimensionOrder²³¹²
- Pixels : ID²³¹³
- Pixels : Interleaved²³¹⁴
- Pixels : PhysicalSizeX²³¹⁵
- Pixels : PhysicalSizeY²³¹⁶
- Pixels : PhysicalSizeZ²³¹⁷
- Pixels : SignificantBits²³¹⁸
- Pixels : SizeC²³¹⁹
- Pixels : SizeT²³²⁰
- Pixels : SizeX²³²¹
- Pixels : SizeY²³²²
- Pixels : SizeZ²³²³
- Pixels : Type²³²⁴
- Plane : TheC²³²⁵
- Plane : TheT²³²⁶
- Plane : TheZ²³²⁷

²³⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²³⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²³⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID

²³⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²³⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²³⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²³⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²³¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²³¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²³¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²³¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²³¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²³¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²³¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²³¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²³¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²³¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²³²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²³²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²³²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²³²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²³²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²³²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²³²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²³²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

Total supported: 30

Total unknown or missing: 445

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²³²⁸ or the previous versions²³²⁹ page to find documentation for the version you are using.

18.2.58 IvisionReader

This page lists supported metadata fields for the Bio-Formats Ivision format reader.

These fields are from the OME data model²³³⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 34 of them (7%).
- Of those, Bio-Formats fully or partially converts 34 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Ivision format reader:

- Channel : ID²³³¹
- Channel : SamplesPerPixel²³³²
- Detector : ID²³³³
- Detector : Type²³³⁴
- DetectorSettings : Binning²³³⁵
- DetectorSettings : Gain²³³⁶
- DetectorSettings : ID²³³⁷
- Image : AcquisitionDate²³³⁸
- Image : ID²³³⁹
- Image : InstrumentRef²³⁴⁰
- Image : Name²³⁴¹
- Instrument : ID²³⁴²
- Objective : Correction²³⁴³
- Objective : ID²³⁴⁴

²³²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²³²⁹<http://www.openmicroscopy.org/site/support/legacy/>

²³³⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²³³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²³³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²³³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²³³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²³³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

²³³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

²³³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²³³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²³³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²³⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²³⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²³⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²³⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

²³⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

- Objective : Immersion²³⁴⁵
- Objective : LensNA²³⁴⁶
- Objective : NominalMagnification²³⁴⁷
- ObjectiveSettings : ID²³⁴⁸
- ObjectiveSettings : RefractiveIndex²³⁴⁹
- Pixels : BigEndian²³⁵⁰
- Pixels : DimensionOrder²³⁵¹
- Pixels : ID²³⁵²
- Pixels : Interleaved²³⁵³
- Pixels : SignificantBits²³⁵⁴
- Pixels : SizeC²³⁵⁵
- Pixels : SizeT²³⁵⁶
- Pixels : SizeX²³⁵⁷
- Pixels : SizeY²³⁵⁸
- Pixels : SizeZ²³⁵⁹
- Pixels : TimeIncrement²³⁶⁰
- Pixels : Type²³⁶¹
- Plane : TheC²³⁶²
- Plane : TheT²³⁶³
- Plane : TheZ²³⁶⁴

Total supported: 34

Total unknown or missing: 441

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²³⁶⁵ or the previous versions²³⁶⁶ page to find documentation for the version you are using.

18.2.59 IPLabReader

This page lists supported metadata fields for the Bio-Formats IPLab format reader.

- ²³⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion
- ²³⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA
- ²³⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification
- ²³⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID
- ²³⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex
- ²³⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ²³⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ²³⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ²³⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ²³⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ²³⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ²³⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ²³⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ²³⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ²³⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ²³⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement
- ²³⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ²³⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ²³⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ²³⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ²³⁶⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ²³⁶⁶<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)²³⁶⁷. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 31 of them (6%).
- Of those, Bio-Formats fully or partially converts 31 (100%).

Supported fields

These fields are fully supported by the Bio-Formats IPLab format reader:

- Channel : ID²³⁶⁸
- Channel : SamplesPerPixel²³⁶⁹
- Image : AcquisitionDate²³⁷⁰
- Image : Description²³⁷¹
- Image : ID²³⁷²
- Image : Name²³⁷³
- Image : ROIRef²³⁷⁴
- Pixels : BigEndian²³⁷⁵
- Pixels : DimensionOrder²³⁷⁶
- Pixels : ID²³⁷⁷
- Pixels : Interleaved²³⁷⁸
- Pixels : PhysicalSizeX²³⁷⁹
- Pixels : PhysicalSizeY²³⁸⁰
- Pixels : SignificantBits²³⁸¹
- Pixels : SizeC²³⁸²
- Pixels : SizeT²³⁸³
- Pixels : SizeX²³⁸⁴
- Pixels : SizeY²³⁸⁵
- Pixels : SizeZ²³⁸⁶
- Pixels : TimeIncrement²³⁸⁷

²³⁶⁷<http://www.openmicroscopy.org/site/support/ome-model/>

²³⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²³⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²³⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²³⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²³⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²³⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²³⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

²³⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²³⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²³⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²³⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²³⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²³⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²³⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²³⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²³⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²³⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²³⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²³⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²³⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

- Pixels : Type²³⁸⁸
- Plane : DeltaT²³⁸⁹
- Plane : TheC²³⁹⁰
- Plane : TheT²³⁹¹
- Plane : TheZ²³⁹²
- ROI : ID²³⁹³
- Rectangle : Height²³⁹⁴
- Rectangle : ID²³⁹⁵
- Rectangle : Width²³⁹⁶
- Rectangle : X²³⁹⁷
- Rectangle : Y²³⁹⁸

Total supported: 31

Total unknown or missing: 444

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²³⁹⁹](#) or the [previous versions²⁴⁰⁰](#) page to find documentation for the version you are using.

18.2.60 JEOLReader

This page lists supported metadata fields for the Bio-Formats JEOL format reader.

These fields are from the [OME data model²⁴⁰¹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats JEOL format reader:

- Channel : ID²⁴⁰²
- Channel : SamplesPerPixel²⁴⁰³
- Image : AcquisitionDate²⁴⁰⁴

²³⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²³⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²³⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²³⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²³⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²³⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

²³⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

²³⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²³⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

²³⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

²³⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

²³⁹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴⁰⁰<http://www.openmicroscopy.org/site/support/legacy/>

²⁴⁰¹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁴⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁴⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁴⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID²⁴⁰⁵
- Image : Name²⁴⁰⁶
- Pixels : BigEndian²⁴⁰⁷
- Pixels : DimensionOrder²⁴⁰⁸
- Pixels : ID²⁴⁰⁹
- Pixels : Interleaved²⁴¹⁰
- Pixels : SignificantBits²⁴¹¹
- Pixels : SizeC²⁴¹²
- Pixels : SizeT²⁴¹³
- Pixels : SizeX²⁴¹⁴
- Pixels : SizeY²⁴¹⁵
- Pixels : SizeZ²⁴¹⁶
- Pixels : Type²⁴¹⁷
- Plane : TheC²⁴¹⁸
- Plane : TheT²⁴¹⁹
- Plane : TheZ²⁴²⁰

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁴²¹ or the previous versions²⁴²² page to find documentation for the version you are using.

18.2.61 JPEG2000Reader

This page lists supported metadata fields for the Bio-Formats JPEG-2000 format reader.

These fields are from the OME data model²⁴²³. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

²⁴⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁴⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁴⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁴⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁴⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁴¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁴¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁴¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁴¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁴¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁴¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁴¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁴¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁴¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁴¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁴²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁴²¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴²²<http://www.openmicroscopy.org/site/support/legacy/>

²⁴²³<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats JPEG-2000 format reader:

- Channel : ID²⁴²⁴
- Channel : SamplesPerPixel²⁴²⁵
- Image : AcquisitionDate²⁴²⁶
- Image : ID²⁴²⁷
- Image : Name²⁴²⁸
- Pixels : BigEndian²⁴²⁹
- Pixels : DimensionOrder²⁴³⁰
- Pixels : ID²⁴³¹
- Pixels : Interleaved²⁴³²
- Pixels : SignificantBits²⁴³³
- Pixels : SizeC²⁴³⁴
- Pixels : SizeT²⁴³⁵
- Pixels : SizeX²⁴³⁶
- Pixels : SizeY²⁴³⁷
- Pixels : SizeZ²⁴³⁸
- Pixels : Type²⁴³⁹
- Plane : TheC²⁴⁴⁰
- Plane : TheT²⁴⁴¹
- Plane : TheZ²⁴⁴²

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁴⁴³ or the previous versions²⁴⁴⁴ page to find documentation for the version you are using.

²⁴²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁴²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁴²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁴²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁴²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁴²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁴³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁴³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁴³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁴³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁴³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁴³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁴³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁴³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁴³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁴³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁴⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁴⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁴⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁴⁴³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴⁴⁴<http://www.openmicroscopy.org/site/support/legacy/>

18.2.62 JPEGReader

This page lists supported metadata fields for the Bio-Formats JPEG format reader.

These fields are from the [OME data model](#)²⁴⁴⁵. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats JPEG format reader:

- Channel : ID²⁴⁴⁶
- Channel : SamplesPerPixel²⁴⁴⁷
- Image : AcquisitionDate²⁴⁴⁸
- Image : ID²⁴⁴⁹
- Image : Name²⁴⁵⁰
- Pixels : BigEndian²⁴⁵¹
- Pixels : DimensionOrder²⁴⁵²
- Pixels : ID²⁴⁵³
- Pixels : Interleaved²⁴⁵⁴
- Pixels : SignificantBits²⁴⁵⁵
- Pixels : SizeC²⁴⁵⁶
- Pixels : SizeT²⁴⁵⁷
- Pixels : SizeX²⁴⁵⁸
- Pixels : SizeY²⁴⁵⁹
- Pixels : SizeZ²⁴⁶⁰
- Pixels : Type²⁴⁶¹
- Plane : TheC²⁴⁶²
- Plane : TheT²⁴⁶³

²⁴⁴⁵<http://www.openmicroscopy.org/site/support/ome-model/>

²⁴⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁴⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁴⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁴⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁴⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁴⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁴⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁴⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁴⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁴⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁴⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁴⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁴⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁴⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁴⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁴⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁴⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁴⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ²⁴⁶⁴

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁴⁶⁵](#) or the [previous versions²⁴⁶⁶](#) page to find documentation for the version you are using.

18.2.63 JPKReader

This page lists supported metadata fields for the Bio-Formats JPK Instruments format reader.

These fields are from the [OME data model²⁴⁶⁷](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats JPK Instruments format reader:

- Channel : ID²⁴⁶⁸
- Channel : SamplesPerPixel²⁴⁶⁹
- Image : AcquisitionDate²⁴⁷⁰
- Image : ID²⁴⁷¹
- Image : Name²⁴⁷²
- Pixels : BigEndian²⁴⁷³
- Pixels : DimensionOrder²⁴⁷⁴
- Pixels : ID²⁴⁷⁵
- Pixels : Interleaved²⁴⁷⁶
- Pixels : SignificantBits²⁴⁷⁷
- Pixels : SizeC²⁴⁷⁸
- Pixels : SizeT²⁴⁷⁹
- Pixels : SizeX²⁴⁸⁰

²⁴⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁴⁶⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴⁶⁶<http://www.openmicroscopy.org/site/support/legacy/>

²⁴⁶⁷<http://www.openmicroscopy.org/site/support/ome-model/>

²⁴⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁴⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁴⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁴⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁴⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁴⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁴⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁴⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁴⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁴⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁴⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁴⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁴⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

- Pixels : SizeY²⁴⁸¹
- Pixels : SizeZ²⁴⁸²
- Pixels : Type²⁴⁸³
- Plane : TheC²⁴⁸⁴
- Plane : TheT²⁴⁸⁵
- Plane : TheZ²⁴⁸⁶

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁴⁸⁷ or the previous versions²⁴⁸⁸ page to find documentation for the version you are using.

18.2.64 JPXReader

This page lists supported metadata fields for the Bio-Formats JPX format reader.

These fields are from the OME data model²⁴⁸⁹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats JPX format reader:

- Channel : ID²⁴⁹⁰
- Channel : SamplesPerPixel²⁴⁹¹
- Image : AcquisitionDate²⁴⁹²
- Image : ID²⁴⁹³
- Image : Name²⁴⁹⁴
- Pixels : BigEndian²⁴⁹⁵
- Pixels : DimensionOrder²⁴⁹⁶
- Pixels : ID²⁴⁹⁷

²⁴⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁴⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁴⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁴⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁴⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁴⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁴⁸⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴⁸⁸<http://www.openmicroscopy.org/site/support/legacy/>

²⁴⁸⁹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁴⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁴⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁴⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁴⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁴⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁴⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁴⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁴⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

- Pixels : Interleaved²⁴⁹⁸
- Pixels : SignificantBits²⁴⁹⁹
- Pixels : SizeC²⁵⁰⁰
- Pixels : SizeT²⁵⁰¹
- Pixels : SizeX²⁵⁰²
- Pixels : SizeY²⁵⁰³
- Pixels : SizeZ²⁵⁰⁴
- Pixels : Type²⁵⁰⁵
- Plane : TheC²⁵⁰⁶
- Plane : TheT²⁵⁰⁷
- Plane : TheZ²⁵⁰⁸

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁵⁰⁹](#) or the [previous versions²⁵¹⁰](#) page to find documentation for the version you are using.

18.2.65 KhorosReader

This page lists supported metadata fields for the Bio-Formats Khoros XV format reader.

These fields are from the [OME data model²⁵¹¹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Khoros XV format reader:

- Channel : ID²⁵¹²
- Channel : SamplesPerPixel²⁵¹³
- Image : AcquisitionDate²⁵¹⁴

²⁴⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁴⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁵⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁵⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁵⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁵⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁵⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁵⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁵⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁵⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁵⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁵⁰⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁵¹⁰<http://www.openmicroscopy.org/site/support/legacy/>

²⁵¹¹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁵¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁵¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁵¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID²⁵¹⁵
- Image : Name²⁵¹⁶
- Pixels : BigEndian²⁵¹⁷
- Pixels : DimensionOrder²⁵¹⁸
- Pixels : ID²⁵¹⁹
- Pixels : Interleaved²⁵²⁰
- Pixels : SignificantBits²⁵²¹
- Pixels : SizeC²⁵²²
- Pixels : SizeT²⁵²³
- Pixels : SizeX²⁵²⁴
- Pixels : SizeY²⁵²⁵
- Pixels : SizeZ²⁵²⁶
- Pixels : Type²⁵²⁷
- Plane : TheC²⁵²⁸
- Plane : TheT²⁵²⁹
- Plane : TheZ²⁵³⁰

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁵³¹ or the previous versions²⁵³² page to find documentation for the version you are using.

18.2.66 KodakReader

This page lists supported metadata fields for the Bio-Formats Kodak Molecular Imaging format reader.

These fields are from the OME data model²⁵³³. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 26 of them (5%).
- Of those, Bio-Formats fully or partially converts 26 (100%).

²⁵¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁵¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁵¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁵¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁵¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁵²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁵²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁵²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁵²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁵²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁵²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁵²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁵²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁵²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁵²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁵³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁵³¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁵³²<http://www.openmicroscopy.org/site/support/legacy/>

²⁵³³<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Kodak Molecular Imaging format reader:

- Channel : ID²⁵³⁴
- Channel : SamplesPerPixel²⁵³⁵
- Image : AcquisitionDate²⁵³⁶
- Image : ID²⁵³⁷
- Image : InstrumentRef²⁵³⁸
- Image : Name²⁵³⁹
- ImagingEnvironment : Temperature²⁵⁴⁰
- Instrument : ID²⁵⁴¹
- Microscope : Model²⁵⁴²
- Pixels : BigEndian²⁵⁴³
- Pixels : DimensionOrder²⁵⁴⁴
- Pixels : ID²⁵⁴⁵
- Pixels : Interleaved²⁵⁴⁶
- Pixels : PhysicalSizeX²⁵⁴⁷
- Pixels : PhysicalSizeY²⁵⁴⁸
- Pixels : SignificantBits²⁵⁴⁹
- Pixels : SizeC²⁵⁵⁰
- Pixels : SizeT²⁵⁵¹
- Pixels : SizeX²⁵⁵²
- Pixels : SizeY²⁵⁵³
- Pixels : SizeZ²⁵⁵⁴
- Pixels : Type²⁵⁵⁵
- Plane : ExposureTime²⁵⁵⁶
- Plane : TheC²⁵⁵⁷

²⁵³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁵³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁵³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁵³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁵³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁵³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁵⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

²⁵⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁵⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁵⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁵⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁵⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁵⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁵⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁵⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁵⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁵⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁵⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁵⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁵⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁵⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁵⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁵⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁵⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

- Plane : TheT²⁵⁵⁸
- Plane : TheZ²⁵⁵⁹

Total supported: 26

Total unknown or missing: 449

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁵⁶⁰](#) or the [previous versions²⁵⁶¹](#) page to find documentation for the version you are using.

18.2.67 LiFlimReader

This page lists supported metadata fields for the Bio-Formats LI-FLIM format reader.

These fields are from the [OME data model²⁵⁶²](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 25 of them (5%).
- Of those, Bio-Formats fully or partially converts 25 (100%).

Supported fields

These fields are fully supported by the Bio-Formats LI-FLIM format reader:

- Channel : ID²⁵⁶³
- Channel : SamplesPerPixel²⁵⁶⁴
- Image : AcquisitionDate²⁵⁶⁵
- Image : ID²⁵⁶⁶
- Image : Name²⁵⁶⁷
- Image : ROIRef²⁵⁶⁸
- Pixels : BigEndian²⁵⁶⁹
- Pixels : DimensionOrder²⁵⁷⁰
- Pixels : ID²⁵⁷¹
- Pixels : Interleaved²⁵⁷²
- Pixels : SignificantBits²⁵⁷³
- Pixels : SizeC²⁵⁷⁴

²⁵⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁵⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁵⁶⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁵⁶¹<http://www.openmicroscopy.org/site/support/legacy/>

²⁵⁶²<http://www.openmicroscopy.org/site/support/ome-model/>

²⁵⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁵⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁵⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁵⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁵⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁵⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

²⁵⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁵⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁵⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁵⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁵⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁵⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT²⁵⁷⁵
- Pixels : SizeX²⁵⁷⁶
- Pixels : SizeY²⁵⁷⁷
- Pixels : SizeZ²⁵⁷⁸
- Pixels : Type²⁵⁷⁹
- Plane : DeltaT²⁵⁸⁰
- Plane : ExposureTime²⁵⁸¹
- Plane : TheC²⁵⁸²
- Plane : TheT²⁵⁸³
- Plane : TheZ²⁵⁸⁴
- Polygon : ID²⁵⁸⁵
- Polygon : Points²⁵⁸⁶
- ROI : ID²⁵⁸⁷

Total supported: 25

Total unknown or missing: 450

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁵⁸⁸](#) or the [previous versions²⁵⁸⁹](#) page to find documentation for the version you are using.

18.2.68 InspectorReader

This page lists supported metadata fields for the Bio-Formats Lavisoin Inspector format reader.

These fields are from the [OME data model²⁵⁹⁰](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Lavisoin Inspector format reader:

- Channel : ID²⁵⁹¹

²⁵⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁵⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁵⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁵⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁵⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁵⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²⁵⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁵⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁵⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁵⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁵⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁵⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

²⁵⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

²⁵⁸⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁵⁸⁹<http://www.openmicroscopy.org/site/support/legacy/>

²⁵⁹⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²⁵⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

- Channel : SamplesPerPixel²⁵⁹²
- Image : AcquisitionDate²⁵⁹³
- Image : ID²⁵⁹⁴
- Image : Name²⁵⁹⁵
- Pixels : BigEndian²⁵⁹⁶
- Pixels : DimensionOrder²⁵⁹⁷
- Pixels : ID²⁵⁹⁸
- Pixels : Interleaved²⁵⁹⁹
- Pixels : SignificantBits²⁶⁰⁰
- Pixels : SizeC²⁶⁰¹
- Pixels : SizeT²⁶⁰²
- Pixels : SizeX²⁶⁰³
- Pixels : SizeY²⁶⁰⁴
- Pixels : SizeZ²⁶⁰⁵
- Pixels : Type²⁶⁰⁶
- Plane : TheC²⁶⁰⁷
- Plane : TheT²⁶⁰⁸
- Plane : TheZ²⁶⁰⁹

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁶¹⁰ or the previous versions²⁶¹¹ page to find documentation for the version you are using.

18.2.69 LeicaReader

This page lists supported metadata fields for the Bio-Formats Leica format reader.

These fields are from the OME data model²⁶¹². Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

²⁵⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁵⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁵⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁵⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁵⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁵⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁵⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁵⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁶⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁶⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁶⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁶⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁶⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁶⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁶⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁶⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁶⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁶⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁶¹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁶¹¹<http://www.openmicroscopy.org/site/support/legacy/>

²⁶¹²<http://www.openmicroscopy.org/site/support/ome-model/>

- The file format itself supports 56 of them (11%).
- Of those, Bio-Formats fully or partially converts 56 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Leica format reader:

- Channel : Color²⁶¹³
- Channel : EmissionWavelength²⁶¹⁴
- Channel : ExcitationWavelength²⁶¹⁵
- Channel : ID²⁶¹⁶
- Channel : Name²⁶¹⁷
- Channel : PinholeSize²⁶¹⁸
- Channel : SamplesPerPixel²⁶¹⁹
- Detector : ID²⁶²⁰
- Detector : Offset²⁶²¹
- Detector : Type²⁶²²
- Detector : Voltage²⁶²³
- DetectorSettings : ID²⁶²⁴
- Filter : ID²⁶²⁵
- Filter : Model²⁶²⁶
- Image : AcquisitionDate²⁶²⁷
- Image : Description²⁶²⁸
- Image : ID²⁶²⁹
- Image : InstrumentRef²⁶³⁰
- Image : Name²⁶³¹
- Instrument : ID²⁶³²
- LightPath : EmissionFilterRef²⁶³³
- Objective : Correction²⁶³⁴
- Objective : ID²⁶³⁵

²⁶¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

²⁶¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

²⁶¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

²⁶¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁶¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁶¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

²⁶¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁶²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²⁶²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

²⁶²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²⁶²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Voltage

²⁶²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²⁶²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

²⁶²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁶²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁶²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁶²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁶³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁶³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁶³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁶³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

²⁶³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

²⁶³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

- Objective : Immersion²⁶³⁶
- Objective : LensNA²⁶³⁷
- Objective : Model²⁶³⁸
- Objective : NominalMagnification²⁶³⁹
- Objective : SerialNumber²⁶⁴⁰
- ObjectiveSettings : ID²⁶⁴¹
- ObjectiveSettings : RefractiveIndex²⁶⁴²
- Pixels : BigEndian²⁶⁴³
- Pixels : DimensionOrder²⁶⁴⁴
- Pixels : ID²⁶⁴⁵
- Pixels : Interleaved²⁶⁴⁶
- Pixels : PhysicalSizeX²⁶⁴⁷
- Pixels : PhysicalSizeY²⁶⁴⁸
- Pixels : PhysicalSizeZ²⁶⁴⁹
- Pixels : SignificantBits²⁶⁵⁰
- Pixels : SizeC²⁶⁵¹
- Pixels : SizeT²⁶⁵²
- Pixels : SizeX²⁶⁵³
- Pixels : SizeY²⁶⁵⁴
- Pixels : SizeZ²⁶⁵⁵
- Pixels : TimeIncrement²⁶⁵⁶
- Pixels : Type²⁶⁵⁷
- Plane : DeltaT²⁶⁵⁸
- Plane : ExposureTime²⁶⁵⁹
- Plane : PositionX²⁶⁶⁰
- Plane : PositionY²⁶⁶¹

²⁶³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

²⁶³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²⁶³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁶³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

²⁶⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

²⁶⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

²⁶⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

²⁶⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁶⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁶⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁶⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁶⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁶⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁶⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²⁶⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁶⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁶⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁶⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁶⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁶⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁶⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

²⁶⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁶⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²⁶⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁶⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²⁶⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

- Plane : TheC²⁶⁶²
- Plane : TheT²⁶⁶³
- Plane : TheZ²⁶⁶⁴
- StageLabel : Name²⁶⁶⁵
- StageLabel : Z²⁶⁶⁶
- TransmittanceRange : CutIn²⁶⁶⁷
- TransmittanceRange : CutOut²⁶⁶⁸

Total supported: 56

Total unknown or missing: 419

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁶⁶⁹](#) or the [previous versions²⁶⁷⁰](#) page to find documentation for the version you are using.

18.2.70 LIFReader

This page lists supported metadata fields for the Bio-Formats Leica Image File Format format reader.

These fields are from the [OME data model²⁶⁷¹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 85 of them (17%).
- Of those, Bio-Formats fully or partially converts 85 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Leica Image File Format format reader:

- Channel : Color²⁶⁷²
- Channel : ExcitationWavelength²⁶⁷³
- Channel : ID²⁶⁷⁴
- Channel : LightSourceSettingsAttenuation²⁶⁷⁵
- Channel : LightSourceSettingsID²⁶⁷⁶
- Channel : Name²⁶⁷⁷
- Channel : PinholeSize²⁶⁷⁸

²⁶⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁶⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁶⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁶⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Name

²⁶⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Z

²⁶⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn

²⁶⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut

²⁶⁶⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁶⁷⁰<http://www.openmicroscopy.org/site/support/legacy/>

²⁶⁷¹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁶⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

²⁶⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

²⁶⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁶⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_Attenuation

²⁶⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID

²⁶⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁶⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

- Channel : SamplesPerPixel²⁶⁷⁹
- Detector : ID²⁶⁸⁰
- Detector : Model²⁶⁸¹
- Detector : Offset²⁶⁸²
- Detector : Type²⁶⁸³
- Detector : Zoom²⁶⁸⁴
- DetectorSettings : Gain²⁶⁸⁵
- DetectorSettings : ID²⁶⁸⁶
- DetectorSettings : Offset²⁶⁸⁷
- Filter : ID²⁶⁸⁸
- Filter : Model²⁶⁸⁹
- Image : AcquisitionDate²⁶⁹⁰
- Image : Description²⁶⁹¹
- Image : ID²⁶⁹²
- Image : InstrumentRef²⁶⁹³
- Image : Name²⁶⁹⁴
- Image : ROIRef²⁶⁹⁵
- Instrument : ID²⁶⁹⁶
- Label : FontSize²⁶⁹⁷
- Label : ID²⁶⁹⁸
- Label : StrokeWidth²⁶⁹⁹
- Label : Text²⁷⁰⁰
- Label : X²⁷⁰¹
- Label : Y²⁷⁰²
- Laser : ID²⁷⁰³
- Laser : LaserMedium²⁷⁰⁴

²⁶⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁶⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²⁶⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁶⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

²⁶⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²⁶⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Zoom

²⁶⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

²⁶⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²⁶⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

²⁶⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

²⁶⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁶⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁶⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁶⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁶⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁶⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁶⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

²⁶⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁶⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

²⁶⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁶⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

²⁷⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

²⁷⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_X

²⁷⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_Y

²⁷⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

²⁷⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

- Laser : Type²⁷⁰⁵
- Laser : Wavelength²⁷⁰⁶
- LightPath : EmissionFilterRef²⁷⁰⁷
- Line : ID²⁷⁰⁸
- Line : X1²⁷⁰⁹
- Line : X2²⁷¹⁰
- Line : Y1²⁷¹¹
- Line : Y2²⁷¹²
- Microscope : Model²⁷¹³
- Microscope : Type²⁷¹⁴
- Objective : Correction²⁷¹⁵
- Objective : ID²⁷¹⁶
- Objective : Immersion²⁷¹⁷
- Objective : LensNA²⁷¹⁸
- Objective : Model²⁷¹⁹
- Objective : NominalMagnification²⁷²⁰
- Objective : SerialNumber²⁷²¹
- ObjectiveSettings : ID²⁷²²
- ObjectiveSettings : RefractiveIndex²⁷²³
- Pixels : BigEndian²⁷²⁴
- Pixels : DimensionOrder²⁷²⁵
- Pixels : ID²⁷²⁶
- Pixels : Interleaved²⁷²⁷
- Pixels : PhysicalSizeX²⁷²⁸
- Pixels : PhysicalSizeY²⁷²⁹
- Pixels : PhysicalSizeZ²⁷³⁰

²⁷⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

²⁷⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

²⁷⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

²⁷⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁷⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X1

²⁷¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X2

²⁷¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y1

²⁷¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y2

²⁷¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁷¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Microscope_Type

²⁷¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

²⁷¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²⁷¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

²⁷¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²⁷¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁷²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

²⁷²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

²⁷²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

²⁷²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

²⁷²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁷²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁷²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁷²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁷²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁷²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁷³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

- Pixels : SignificantBits²⁷³¹
- Pixels : SizeC²⁷³²
- Pixels : SizeT²⁷³³
- Pixels : SizeX²⁷³⁴
- Pixels : SizeY²⁷³⁵
- Pixels : SizeZ²⁷³⁶
- Pixels : TimeIncrement²⁷³⁷
- Pixels : Type²⁷³⁸
- Plane : DeltaT²⁷³⁹
- Plane : ExposureTime²⁷⁴⁰
- Plane : PositionX²⁷⁴¹
- Plane : PositionY²⁷⁴²
- Plane : PositionZ²⁷⁴³
- Plane : TheC²⁷⁴⁴
- Plane : TheT²⁷⁴⁵
- Plane : TheZ²⁷⁴⁶
- Polygon : ID²⁷⁴⁷
- Polygon : Points²⁷⁴⁸
- ROI : ID²⁷⁴⁹
- Rectangle : Height²⁷⁵⁰
- Rectangle : ID²⁷⁵¹
- Rectangle : Width²⁷⁵²
- Rectangle : X²⁷⁵³
- Rectangle : Y²⁷⁵⁴
- TransmittanceRange : CutIn²⁷⁵⁵
- TransmittanceRange : CutOut²⁷⁵⁶

²⁷³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁷³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁷³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁷³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁷³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁷³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁷³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

²⁷³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁷³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²⁷⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁷⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²⁷⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²⁷⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

²⁷⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁷⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁷⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁷⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁷⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

²⁷⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

²⁷⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

²⁷⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁷⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

²⁷⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

²⁷⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

²⁷⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn

²⁷⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut

Total supported: 85

Total unknown or missing: 390

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁷⁵⁷ or the previous versions²⁷⁵⁸ page to find documentation for the version you are using.

18.2.71 LeicaSCNReader

This page lists supported metadata fields for the Bio-Formats Leica SCN format reader.

These fields are from the OME data model²⁷⁵⁹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 33 of them (6%).
- Of those, Bio-Formats fully or partially converts 33 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Leica SCN format reader:

- Channel : ID²⁷⁶⁰
- Channel : IlluminationType²⁷⁶¹
- Channel : SamplesPerPixel²⁷⁶²
- Image : AcquisitionDate²⁷⁶³
- Image : Description²⁷⁶⁴
- Image : ID²⁷⁶⁵
- Image : InstrumentRef²⁷⁶⁶
- Image : Name²⁷⁶⁷
- Instrument : ID²⁷⁶⁸
- Objective : CalibratedMagnification²⁷⁶⁹
- Objective : ID²⁷⁷⁰
- Objective : LensNA²⁷⁷¹
- Objective : NominalMagnification²⁷⁷²
- ObjectiveSettings : ID²⁷⁷³

²⁷⁵⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁷⁵⁸<http://www.openmicroscopy.org/site/support/legacy/>

²⁷⁵⁹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁷⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁷⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_IlluminationType

²⁷⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁷⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁷⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁷⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁷⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁷⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁷⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁷⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

²⁷⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²⁷⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²⁷⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

²⁷⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

- Pixels : BigEndian²⁷⁷⁴
- Pixels : DimensionOrder²⁷⁷⁵
- Pixels : ID²⁷⁷⁶
- Pixels : Interleaved²⁷⁷⁷
- Pixels : PhysicalSizeX²⁷⁷⁸
- Pixels : PhysicalSizeY²⁷⁷⁹
- Pixels : PhysicalSizeZ²⁷⁸⁰
- Pixels : SignificantBits²⁷⁸¹
- Pixels : SizeC²⁷⁸²
- Pixels : SizeT²⁷⁸³
- Pixels : SizeX²⁷⁸⁴
- Pixels : SizeY²⁷⁸⁵
- Pixels : SizeZ²⁷⁸⁶
- Pixels : Type²⁷⁸⁷
- Plane : PositionX²⁷⁸⁸
- Plane : PositionY²⁷⁸⁹
- Plane : TheC²⁷⁹⁰
- Plane : TheT²⁷⁹¹
- Plane : TheZ²⁷⁹²

Total supported: 33

Total unknown or missing: 442

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁷⁹³ or the previous versions²⁷⁹⁴ page to find documentation for the version you are using.

18.2.72 LEORReader

This page lists supported metadata fields for the Bio-Formats LEO format reader.

- ²⁷⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ²⁷⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ²⁷⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ²⁷⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ²⁷⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ²⁷⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ²⁷⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ
- ²⁷⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ²⁷⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ²⁷⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ²⁷⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ²⁷⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ²⁷⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ²⁷⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ²⁷⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX
- ²⁷⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY
- ²⁷⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ²⁷⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ²⁷⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ²⁷⁹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ²⁷⁹⁴<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)²⁷⁹⁵. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 27 of them (5%).
- Of those, Bio-Formats fully or partially converts 27 (100%).

Supported fields

These fields are fully supported by the Bio-Formats LEO format reader:

- Channel : ID²⁷⁹⁶
- Channel : SamplesPerPixel²⁷⁹⁷
- Image : AcquisitionDate²⁷⁹⁸
- Image : ID²⁷⁹⁹
- Image : InstrumentRef²⁸⁰⁰
- Image : Name²⁸⁰¹
- Instrument : ID²⁸⁰²
- Objective : Correction²⁸⁰³
- Objective : ID²⁸⁰⁴
- Objective : Immersion²⁸⁰⁵
- Objective : WorkingDistance²⁸⁰⁶
- Pixels : BigEndian²⁸⁰⁷
- Pixels : DimensionOrder²⁸⁰⁸
- Pixels : ID²⁸⁰⁹
- Pixels : Interleaved²⁸¹⁰
- Pixels : PhysicalSizeX²⁸¹¹
- Pixels : PhysicalSizeY²⁸¹²
- Pixels : SignificantBits²⁸¹³
- Pixels : SizeC²⁸¹⁴
- Pixels : SizeT²⁸¹⁵

²⁷⁹⁵<http://www.openmicroscopy.org/site/support/ome-model/>

²⁷⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁷⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁷⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁷⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁸⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁸⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁸⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁸⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

²⁸⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²⁸⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

²⁸⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

²⁸⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁸⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁸⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁸¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁸¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁸¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁸¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁸¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁸¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

- Pixels : SizeX²⁸¹⁶
- Pixels : SizeY²⁸¹⁷
- Pixels : SizeZ²⁸¹⁸
- Pixels : Type²⁸¹⁹
- Plane : TheC²⁸²⁰
- Plane : TheT²⁸²¹
- Plane : TheZ²⁸²²

Total supported: 27

Total unknown or missing: 448

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁸²³](#) or the [previous versions²⁸²⁴](#) page to find documentation for the version you are using.

18.2.73 L2DReader

This page lists supported metadata fields for the Bio-Formats Li-Cor L2D format reader.

These fields are from the [OME data model²⁸²⁵](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 29 of them (6%).
- Of those, Bio-Formats fully or partially converts 29 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Li-Cor L2D format reader:

- Channel : ID²⁸²⁶
- Channel : LightSourceSettingsID²⁸²⁷
- Channel : SamplesPerPixel²⁸²⁸
- Image : AcquisitionDate²⁸²⁹
- Image : Description²⁸³⁰
- Image : ID²⁸³¹
- Image : InstrumentRef²⁸³²

²⁸¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁸¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁸¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁸¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁸²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁸²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁸²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁸²³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁸²⁴<http://www.openmicroscopy.org/site/support/legacy/>

²⁸²⁵<http://www.openmicroscopy.org/site/support/ome-model/>

²⁸²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁸²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID

²⁸²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁸²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁸³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁸³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁸³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

- Image : Name²⁸³³
- Instrument : ID²⁸³⁴
- Laser : ID²⁸³⁵
- Laser : LaserMedium²⁸³⁶
- Laser : Type²⁸³⁷
- Laser : Wavelength²⁸³⁸
- Microscope : Model²⁸³⁹
- Microscope : Type²⁸⁴⁰
- Pixels : BigEndian²⁸⁴¹
- Pixels : DimensionOrder²⁸⁴²
- Pixels : ID²⁸⁴³
- Pixels : Interleaved²⁸⁴⁴
- Pixels : SignificantBits²⁸⁴⁵
- Pixels : SizeC²⁸⁴⁶
- Pixels : SizeT²⁸⁴⁷
- Pixels : SizeX²⁸⁴⁸
- Pixels : SizeY²⁸⁴⁹
- Pixels : SizeZ²⁸⁵⁰
- Pixels : Type²⁸⁵¹
- Plane : TheC²⁸⁵²
- Plane : TheT²⁸⁵³
- Plane : TheZ²⁸⁵⁴

Total supported: 29

Total unknown or missing: 446

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁸⁵⁵ or the previous versions²⁸⁵⁶ page to find documentation for the version you are using.

²⁸³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁸³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁸³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

²⁸³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

²⁸³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

²⁸³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

²⁸³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁸⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Microscope_Type

²⁸⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁸⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁸⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁸⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁸⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁸⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁸⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁸⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁸⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁸⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁸⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁸⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁸⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁸⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁸⁵⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁸⁵⁶<http://www.openmicroscopy.org/site/support/legacy/>

18.2.74 LIMReader

This page lists supported metadata fields for the Bio-Formats Laboratory Imaging format reader.

These fields are from the [OME data model](#)²⁸⁵⁷. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Laboratory Imaging format reader:

- Channel : ID²⁸⁵⁸
- Channel : SamplesPerPixel²⁸⁵⁹
- Image : AcquisitionDate²⁸⁶⁰
- Image : ID²⁸⁶¹
- Image : Name²⁸⁶²
- Pixels : BigEndian²⁸⁶³
- Pixels : DimensionOrder²⁸⁶⁴
- Pixels : ID²⁸⁶⁵
- Pixels : Interleaved²⁸⁶⁶
- Pixels : SignificantBits²⁸⁶⁷
- Pixels : SizeC²⁸⁶⁸
- Pixels : SizeT²⁸⁶⁹
- Pixels : SizeX²⁸⁷⁰
- Pixels : SizeY²⁸⁷¹
- Pixels : SizeZ²⁸⁷²
- Pixels : Type²⁸⁷³
- Plane : TheC²⁸⁷⁴
- Plane : TheT²⁸⁷⁵

²⁸⁵⁷<http://www.openmicroscopy.org/site/support/ome-model/>

²⁸⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁸⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁸⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁸⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁸⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁸⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁸⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁸⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁸⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁸⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁸⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁸⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁸⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁸⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁸⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁸⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁸⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁸⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ²⁸⁷⁶

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁸⁷⁷](#) or the [previous versions²⁸⁷⁸](#) page to find documentation for the version you are using.

18.2.75 MetamorphTiffReader

This page lists supported metadata fields for the Bio-Formats Metamorph TIFF format reader.

These fields are from the [OME data model²⁸⁷⁹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 38 of them (8%).
- Of those, Bio-Formats fully or partially converts 38 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Metamorph TIFF format reader:

- Channel : ID²⁸⁸⁰
- Channel : Name²⁸⁸¹
- Channel : SamplesPerPixel²⁸⁸²
- Image : AcquisitionDate²⁸⁸³
- Image : Description²⁸⁸⁴
- Image : ID²⁸⁸⁵
- Image : Name²⁸⁸⁶
- ImagingEnvironment : Temperature²⁸⁸⁷
- Pixels : BigEndian²⁸⁸⁸
- Pixels : DimensionOrder²⁸⁸⁹
- Pixels : ID²⁸⁹⁰
- Pixels : Interleaved²⁸⁹¹
- Pixels : PhysicalSizeX²⁸⁹²

²⁸⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁸⁷⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁸⁷⁸<http://www.openmicroscopy.org/site/support/legacy/>

²⁸⁷⁹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁸⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁸⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁸⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁸⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁸⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁸⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁸⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁸⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

²⁸⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁸⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁸⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁸⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁸⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

- Pixels : PhysicalSizeY²⁸⁹³
- Pixels : PhysicalSizeZ²⁸⁹⁴
- Pixels : SignificantBits²⁸⁹⁵
- Pixels : SizeC²⁸⁹⁶
- Pixels : SizeT²⁸⁹⁷
- Pixels : SizeX²⁸⁹⁸
- Pixels : SizeY²⁸⁹⁹
- Pixels : SizeZ²⁹⁰⁰
- Pixels : Type²⁹⁰¹
- Plane : DeltaT²⁹⁰²
- Plane : ExposureTime²⁹⁰³
- Plane : PositionX²⁹⁰⁴
- Plane : PositionY²⁹⁰⁵
- Plane : TheC²⁹⁰⁶
- Plane : TheT²⁹⁰⁷
- Plane : TheZ²⁹⁰⁸
- Plate : ColumnNamingConvention²⁹⁰⁹
- Plate : ID²⁹¹⁰
- Plate : RowNamingConvention²⁹¹¹
- Well : Column²⁹¹²
- Well : ID²⁹¹³
- Well : Row²⁹¹⁴
- WellSample : ID²⁹¹⁵
- WellSample : ImageRef²⁹¹⁶
- WellSample : Index²⁹¹⁷

²⁸⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁸⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²⁸⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁸⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁸⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁸⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁸⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²⁹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²⁹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²⁹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

²⁹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

²⁹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

²⁹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

²⁹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

²⁹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

²⁹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

²⁹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

²⁹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

Total supported: 38

Total unknown or missing: 437

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version²⁹¹⁸](#) or the [previous versions²⁹¹⁹](#) page to find documentation for the version you are using.

18.2.76 MetamorphReader

This page lists supported metadata fields for the Bio-Formats Metamorph STK format reader.

These fields are from the [OME data model²⁹²⁰](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 46 of them (9%).
- Of those, Bio-Formats fully or partially converts 46 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Metamorph STK format reader:

- Channel : ID²⁹²¹
- Channel : LightSourceSettingsID²⁹²²
- Channel : LightSourceSettingsWavelength²⁹²³
- Channel : Name²⁹²⁴
- Channel : SamplesPerPixel²⁹²⁵
- Detector : ID²⁹²⁶
- Detector : Type²⁹²⁷
- DetectorSettings : Binning²⁹²⁸
- DetectorSettings : Gain²⁹²⁹
- DetectorSettings : ID²⁹³⁰
- DetectorSettings : ReadOutRate²⁹³¹
- Image : AcquisitionDate²⁹³²
- Image : Description²⁹³³
- Image : ID²⁹³⁴

²⁹¹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁹¹⁹<http://www.openmicroscopy.org/site/support/legacy/>

²⁹²⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²⁹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID

²⁹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_Wavelength

²⁹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²⁹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²⁹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

²⁹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

²⁹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²⁹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

²⁹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : InstrumentRef²⁹³⁵
- Image : Name²⁹³⁶
- ImagingEnvironment : Temperature²⁹³⁷
- Instrument : ID²⁹³⁸
- Laser : ID²⁹³⁹
- Laser : LaserMedium²⁹⁴⁰
- Laser : Type²⁹⁴¹
- Objective : ID²⁹⁴²
- Objective : LensNA²⁹⁴³
- ObjectiveSettings : ID²⁹⁴⁴
- Pixels : BigEndian²⁹⁴⁵
- Pixels : DimensionOrder²⁹⁴⁶
- Pixels : ID²⁹⁴⁷
- Pixels : Interleaved²⁹⁴⁸
- Pixels : PhysicalSizeX²⁹⁴⁹
- Pixels : PhysicalSizeY²⁹⁵⁰
- Pixels : PhysicalSizeZ²⁹⁵¹
- Pixels : SignificantBits²⁹⁵²
- Pixels : SizeC²⁹⁵³
- Pixels : SizeT²⁹⁵⁴
- Pixels : SizeX²⁹⁵⁵
- Pixels : SizeY²⁹⁵⁶
- Pixels : SizeZ²⁹⁵⁷
- Pixels : Type²⁹⁵⁸
- Plane : DeltaT²⁹⁵⁹
- Plane : ExposureTime²⁹⁶⁰

²⁹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

²⁹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

²⁹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

²⁹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

²⁹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²⁹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²⁹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

²⁹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²⁹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²⁹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

- Plane : PositionX²⁹⁶¹
- Plane : PositionY²⁹⁶²
- Plane : PositionZ²⁹⁶³
- Plane : TheC²⁹⁶⁴
- Plane : TheT²⁹⁶⁵
- Plane : TheZ²⁹⁶⁶

Total supported: 46

Total unknown or missing: 429

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁹⁶⁷ or the previous versions²⁹⁶⁸ page to find documentation for the version you are using.

18.2.77 MIASReader

This page lists supported metadata fields for the Bio-Formats MIAS format reader.

These fields are from the OME data model²⁹⁶⁹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 64 of them (13%).
- Of those, Bio-Formats fully or partially converts 64 (100%).

Supported fields

These fields are fully supported by the Bio-Formats MIAS format reader:

- Channel : Color²⁹⁷⁰
- Channel : ID²⁹⁷¹
- Channel : Name²⁹⁷²
- Channel : SamplesPerPixel²⁹⁷³
- Ellipse : ID²⁹⁷⁴
- Ellipse : RadiusX²⁹⁷⁵
- Ellipse : RadiusY²⁹⁷⁶
- Ellipse : Text²⁹⁷⁷

²⁹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²⁹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²⁹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

²⁹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁹⁶⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁹⁶⁸<http://www.openmicroscopy.org/site/support/legacy/>

²⁹⁶⁹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

²⁹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusX

²⁹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusY

²⁹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

- Ellipse : TheT²⁹⁷⁸
- Ellipse : TheZ²⁹⁷⁹
- Ellipse : X²⁹⁸⁰
- Ellipse : Y²⁹⁸¹
- Experiment : Description²⁹⁸²
- Experiment : ID²⁹⁸³
- Experiment : Type²⁹⁸⁴
- Image : AcquisitionDate²⁹⁸⁵
- Image : ExperimentRef²⁹⁸⁶
- Image : ID²⁹⁸⁷
- Image : InstrumentRef²⁹⁸⁸
- Image : Name²⁹⁸⁹
- Image : ROIRef²⁹⁹⁰
- Instrument : ID²⁹⁹¹
- Mask : FillColor²⁹⁹²
- Mask : Height²⁹⁹³
- Mask : ID²⁹⁹⁴
- Mask : StrokeColor²⁹⁹⁵
- Mask : Width²⁹⁹⁶
- Mask : X²⁹⁹⁷
- Mask : Y²⁹⁹⁸
- Objective : ID²⁹⁹⁹
- Objective : Model³⁰⁰⁰
- Objective : NominalMagnification³⁰⁰¹
- Pixels : BigEndian³⁰⁰²
- Pixels : DimensionOrder³⁰⁰³

²⁹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

²⁹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

²⁹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_X

²⁹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_Y

²⁹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Description

²⁹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID

²⁹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type

²⁹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimentRef_ID

²⁹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

²⁹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor

²⁹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Height

²⁹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

²⁹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Width

²⁹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_X

²⁹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Y

²⁹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³⁰⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁰⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

³⁰⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁰⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID³⁰⁰⁴
- Pixels : Interleaved³⁰⁰⁵
- Pixels : PhysicalSizeX³⁰⁰⁶
- Pixels : PhysicalSizeY³⁰⁰⁷
- Pixels : SignificantBits³⁰⁰⁸
- Pixels : SizeC³⁰⁰⁹
- Pixels : SizeT³⁰¹⁰
- Pixels : SizeX³⁰¹¹
- Pixels : SizeY³⁰¹²
- Pixels : SizeZ³⁰¹³
- Pixels : Type³⁰¹⁴
- Plane : ExposureTime³⁰¹⁵
- Plane : TheC³⁰¹⁶
- Plane : TheT³⁰¹⁷
- Plane : TheZ³⁰¹⁸
- Plate : ColumnNamingConvention³⁰¹⁹
- Plate : ExternalIdentifier³⁰²⁰
- Plate : ID³⁰²¹
- Plate : Name³⁰²²
- Plate : RowNamingConvention³⁰²³
- PlateAcquisition : ID³⁰²⁴
- PlateAcquisition : MaximumFieldCount³⁰²⁵
- PlateAcquisition : WellSampleRef³⁰²⁶
- ROI : ID³⁰²⁷
- Well : Column³⁰²⁸
- Well : ID³⁰²⁹

³⁰⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁰⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁰⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁰⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁰⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁰⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁰¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁰¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁰¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁰¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁰¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁰¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁰¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁰¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁰¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁰¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

³⁰²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ExternalIdentifier

³⁰²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

³⁰²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

³⁰²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

³⁰²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

³⁰²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

³⁰²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

³⁰²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

³⁰²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

³⁰²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

- Well : Row³⁰³⁰
- WellSample : ID³⁰³¹
- WellSample : ImageRef³⁰³²
- WellSample : Index³⁰³³

Total supported: 64

Total unknown or missing: 411

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁰³⁴ or the previous versions³⁰³⁵ page to find documentation for the version you are using.

18.2.78 MicromanagerReader

This page lists supported metadata fields for the Bio-Formats Micro-Manager format reader.

These fields are from the OME data model³⁰³⁶. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 38 of them (8%).
- Of those, Bio-Formats fully or partially converts 38 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Micro-Manager format reader:

- Channel : ID³⁰³⁷
- Channel : Name³⁰³⁸
- Channel : SamplesPerPixel³⁰³⁹
- Detector : ID³⁰⁴⁰
- Detector : Manufacturer³⁰⁴¹
- Detector : Model³⁰⁴²
- Detector : SerialNumber³⁰⁴³
- Detector : Type³⁰⁴⁴
- DetectorSettings : Binning³⁰⁴⁵
- DetectorSettings : Gain³⁰⁴⁶

³⁰³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

³⁰³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

³⁰³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

³⁰³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

³⁰³⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰³⁵<http://www.openmicroscopy.org/site/support/legacy/>

³⁰³⁶<http://www.openmicroscopy.org/site/support/ome-model/>

³⁰³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁰³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³⁰³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁰⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³⁰⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

³⁰⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁰⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

³⁰⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³⁰⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

³⁰⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

- DetectorSettings : ID³⁰⁴⁷
- DetectorSettings : Voltage³⁰⁴⁸
- Image : AcquisitionDate³⁰⁴⁹
- Image : Description³⁰⁵⁰
- Image : ID³⁰⁵¹
- Image : InstrumentRef³⁰⁵²
- Image : Name³⁰⁵³
- ImagingEnvironment : Temperature³⁰⁵⁴
- Instrument : ID³⁰⁵⁵
- Pixels : BigEndian³⁰⁵⁶
- Pixels : DimensionOrder³⁰⁵⁷
- Pixels : ID³⁰⁵⁸
- Pixels : Interleaved³⁰⁵⁹
- Pixels : PhysicalSizeX³⁰⁶⁰
- Pixels : PhysicalSizeY³⁰⁶¹
- Pixels : PhysicalSizeZ³⁰⁶²
- Pixels : SignificantBits³⁰⁶³
- Pixels : SizeC³⁰⁶⁴
- Pixels : SizeT³⁰⁶⁵
- Pixels : SizeX³⁰⁶⁶
- Pixels : SizeY³⁰⁶⁷
- Pixels : SizeZ³⁰⁶⁸
- Pixels : Type³⁰⁶⁹
- Plane : DeltaT³⁰⁷⁰
- Plane : ExposureTime³⁰⁷¹
- Plane : TheC³⁰⁷²

³⁰⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³⁰⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

³⁰⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁰⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³⁰⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁰⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³⁰⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁰⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

³⁰⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁰⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁰⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁰⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁰⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁰⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁰⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁰⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³⁰⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁰⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁰⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁰⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁰⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁰⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁰⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁰⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³⁰⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁰⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

- Plane : TheT³⁰⁷³
- Plane : TheZ³⁰⁷⁴

Total supported: 38

Total unknown or missing: 437

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁰⁷⁵ or the previous versions³⁰⁷⁶ page to find documentation for the version you are using.

18.2.79 MINCReader

This page lists supported metadata fields for the Bio-Formats MINC MRI format reader.

These fields are from the OME data model³⁰⁷⁷. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 23 of them (4%).
- Of those, Bio-Formats fully or partially converts 23 (100%).

Supported fields

These fields are fully supported by the Bio-Formats MINC MRI format reader:

- Channel : ID³⁰⁷⁸
- Channel : SamplesPerPixel³⁰⁷⁹
- Image : AcquisitionDate³⁰⁸⁰
- Image : Description³⁰⁸¹
- Image : ID³⁰⁸²
- Image : Name³⁰⁸³
- Pixels : BigEndian³⁰⁸⁴
- Pixels : DimensionOrder³⁰⁸⁵
- Pixels : ID³⁰⁸⁶
- Pixels : Interleaved³⁰⁸⁷
- Pixels : PhysicalSizeX³⁰⁸⁸
- Pixels : PhysicalSizeY³⁰⁸⁹

³⁰⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁰⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁰⁷⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰⁷⁶<http://www.openmicroscopy.org/site/support/legacy/>

³⁰⁷⁷<http://www.openmicroscopy.org/site/support/ome-model/>

³⁰⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁰⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁰⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁰⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³⁰⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁰⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁰⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁰⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁰⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁰⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁰⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁰⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

- Pixels : PhysicalSizeZ³⁰⁹⁰
- Pixels : SignificantBits³⁰⁹¹
- Pixels : SizeC³⁰⁹²
- Pixels : SizeT³⁰⁹³
- Pixels : SizeX³⁰⁹⁴
- Pixels : SizeY³⁰⁹⁵
- Pixels : SizeZ³⁰⁹⁶
- Pixels : Type³⁰⁹⁷
- Plane : TheC³⁰⁹⁸
- Plane : TheT³⁰⁹⁹
- Plane : TheZ³¹⁰⁰

Total supported: 23

Total unknown or missing: 452

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³¹⁰¹](#) or the [previous versions³¹⁰²](#) page to find documentation for the version you are using.

18.2.80 MRWReader

This page lists supported metadata fields for the Bio-Formats Minolta MRW format reader.

These fields are from the [OME data model³¹⁰³](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Minolta MRW format reader:

- Channel : ID³¹⁰⁴
- Channel : SamplesPerPixel³¹⁰⁵
- Image : AcquisitionDate³¹⁰⁶

³⁰⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³⁰⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁰⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁰⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁰⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁰⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁰⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁰⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁰⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁰⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³¹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³¹⁰¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹⁰²<http://www.openmicroscopy.org/site/support/legacy/>

³¹⁰³<http://www.openmicroscopy.org/site/support/ome-model/>

³¹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³¹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³¹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID³¹⁰⁷
- Image : Name³¹⁰⁸
- Pixels : BigEndian³¹⁰⁹
- Pixels : DimensionOrder³¹¹⁰
- Pixels : ID³¹¹¹
- Pixels : Interleaved³¹¹²
- Pixels : SignificantBits³¹¹³
- Pixels : SizeC³¹¹⁴
- Pixels : SizeT³¹¹⁵
- Pixels : SizeX³¹¹⁶
- Pixels : SizeY³¹¹⁷
- Pixels : SizeZ³¹¹⁸
- Pixels : Type³¹¹⁹
- Plane : TheC³¹²⁰
- Plane : TheT³¹²¹
- Plane : TheZ³¹²²

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³¹²³ or the previous versions³¹²⁴ page to find documentation for the version you are using.

18.2.81 MNGReader

This page lists supported metadata fields for the Bio-Formats Multiple Network Graphics format reader.

These fields are from the OME data model³¹²⁵. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

³¹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³¹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³¹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³¹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³¹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³¹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³¹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³¹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³¹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³¹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³¹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³¹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³¹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³¹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³¹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³¹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³¹²³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹²⁴<http://www.openmicroscopy.org/site/support/legacy/>

³¹²⁵<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Multiple Network Graphics format reader:

- Channel : ID³¹²⁶
- Channel : SamplesPerPixel³¹²⁷
- Image : AcquisitionDate³¹²⁸
- Image : ID³¹²⁹
- Image : Name³¹³⁰
- Pixels : BigEndian³¹³¹
- Pixels : DimensionOrder³¹³²
- Pixels : ID³¹³³
- Pixels : Interleaved³¹³⁴
- Pixels : SignificantBits³¹³⁵
- Pixels : SizeC³¹³⁶
- Pixels : SizeT³¹³⁷
- Pixels : SizeX³¹³⁸
- Pixels : SizeY³¹³⁹
- Pixels : SizeZ³¹⁴⁰
- Pixels : Type³¹⁴¹
- Plane : TheC³¹⁴²
- Plane : TheT³¹⁴³
- Plane : TheZ³¹⁴⁴

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³¹⁴⁵ or the previous versions³¹⁴⁶ page to find documentation for the version you are using.

- ³¹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID
- ³¹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel
- ³¹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate
- ³¹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ³¹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ³¹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ³¹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ³¹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ³¹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ³¹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ³¹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ³¹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ³¹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ³¹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ³¹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ³¹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ³¹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ³¹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ³¹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ³¹⁴⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ³¹⁴⁶<http://www.openmicroscopy.org/site/support/legacy/>

18.2.82 MolecularImagingReader

This page lists supported metadata fields for the Bio-Formats Molecular Imaging format reader.

These fields are from the [OME data model](#)³¹⁴⁷. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 21 of them (4%).
- Of those, Bio-Formats fully or partially converts 21 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Molecular Imaging format reader:

- Channel : ID³¹⁴⁸
- Channel : SamplesPerPixel³¹⁴⁹
- Image : AcquisitionDate³¹⁵⁰
- Image : ID³¹⁵¹
- Image : Name³¹⁵²
- Pixels : BigEndian³¹⁵³
- Pixels : DimensionOrder³¹⁵⁴
- Pixels : ID³¹⁵⁵
- Pixels : Interleaved³¹⁵⁶
- Pixels : PhysicalSizeX³¹⁵⁷
- Pixels : PhysicalSizeY³¹⁵⁸
- Pixels : SignificantBits³¹⁵⁹
- Pixels : SizeC³¹⁶⁰
- Pixels : SizeT³¹⁶¹
- Pixels : SizeX³¹⁶²
- Pixels : SizeY³¹⁶³
- Pixels : SizeZ³¹⁶⁴
- Pixels : Type³¹⁶⁵

³¹⁴⁷<http://www.openmicroscopy.org/site/support/ome-model/>

³¹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³¹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³¹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³¹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³¹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³¹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³¹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³¹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³¹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³¹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³¹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³¹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³¹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³¹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³¹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³¹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³¹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³¹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC³¹⁶⁶
- Plane : TheT³¹⁶⁷
- Plane : TheZ³¹⁶⁸

Total supported: 21

Total unknown or missing: 454

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³¹⁶⁹](#) or the [previous versions³¹⁷⁰](#) page to find documentation for the version you are using.

18.2.83 MRCReader

This page lists supported metadata fields for the Bio-Formats Medical Research Council format reader.

These fields are from the [OME data model³¹⁷¹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Medical Research Council format reader:

- Channel : ID³¹⁷²
- Channel : SamplesPerPixel³¹⁷³
- Image : AcquisitionDate³¹⁷⁴
- Image : ID³¹⁷⁵
- Image : Name³¹⁷⁶
- Pixels : BigEndian³¹⁷⁷
- Pixels : DimensionOrder³¹⁷⁸
- Pixels : ID³¹⁷⁹
- Pixels : Interleaved³¹⁸⁰
- Pixels : PhysicalSizeX³¹⁸¹
- Pixels : PhysicalSizeY³¹⁸²

³¹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³¹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³¹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³¹⁶⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹⁷⁰<http://www.openmicroscopy.org/site/support/legacy/>

³¹⁷¹<http://www.openmicroscopy.org/site/support/ome-model/>

³¹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³¹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³¹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³¹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³¹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³¹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³¹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³¹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³¹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³¹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³¹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

- Pixels : PhysicalSizeZ³¹⁸³
- Pixels : SignificantBits³¹⁸⁴
- Pixels : SizeC³¹⁸⁵
- Pixels : SizeT³¹⁸⁶
- Pixels : SizeX³¹⁸⁷
- Pixels : SizeY³¹⁸⁸
- Pixels : SizeZ³¹⁸⁹
- Pixels : Type³¹⁹⁰
- Plane : TheC³¹⁹¹
- Plane : TheT³¹⁹²
- Plane : TheZ³¹⁹³

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³¹⁹⁴](#) or the [previous versions³¹⁹⁵](#) page to find documentation for the version you are using.

18.2.84 NikonReader

This page lists supported metadata fields for the Bio-Formats Nikon NEF format reader.

These fields are from the [OME data model³¹⁹⁶](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Nikon NEF format reader:

- Channel : ID³¹⁹⁷
- Channel : SamplesPerPixel³¹⁹⁸
- Image : AcquisitionDate³¹⁹⁹

³¹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³¹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³¹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³¹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³¹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³¹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³¹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³¹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³¹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³¹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³¹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³¹⁹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹⁹⁵<http://www.openmicroscopy.org/site/support/legacy/>

³¹⁹⁶<http://www.openmicroscopy.org/site/support/ome-model/>

³¹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³¹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³¹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID³²⁰⁰
- Image : Name³²⁰¹
- Pixels : BigEndian³²⁰²
- Pixels : DimensionOrder³²⁰³
- Pixels : ID³²⁰⁴
- Pixels : Interleaved³²⁰⁵
- Pixels : SignificantBits³²⁰⁶
- Pixels : SizeC³²⁰⁷
- Pixels : SizeT³²⁰⁸
- Pixels : SizeX³²⁰⁹
- Pixels : SizeY³²¹⁰
- Pixels : SizeZ³²¹¹
- Pixels : Type³²¹²
- Plane : TheC³²¹³
- Plane : TheT³²¹⁴
- Plane : TheZ³²¹⁵

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³²¹⁶ or the previous versions³²¹⁷ page to find documentation for the version you are using.

18.2.85 NiftiReader

This page lists supported metadata fields for the Bio-Formats NIFTI format reader.

These fields are from the OME data model³²¹⁸. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 24 of them (5%).
- Of those, Bio-Formats fully or partially converts 24 (100%).

³²⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³²⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³²⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³²⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³²⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³²⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³²⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³²⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³²⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³²⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³²¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³²¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³²¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³²¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³²¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³²¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³²¹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²¹⁷<http://www.openmicroscopy.org/site/support/legacy/>

³²¹⁸<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats NIFTI format reader:

- Channel : ID³²¹⁹
- Channel : SamplesPerPixel³²²⁰
- Image : AcquisitionDate³²²¹
- Image : Description³²²²
- Image : ID³²²³
- Image : Name³²²⁴
- Pixels : BigEndian³²²⁵
- Pixels : DimensionOrder³²²⁶
- Pixels : ID³²²⁷
- Pixels : Interleaved³²²⁸
- Pixels : PhysicalSizeX³²²⁹
- Pixels : PhysicalSizeY³²³⁰
- Pixels : PhysicalSizeZ³²³¹
- Pixels : SignificantBits³²³²
- Pixels : SizeC³²³³
- Pixels : SizeT³²³⁴
- Pixels : SizeX³²³⁵
- Pixels : SizeY³²³⁶
- Pixels : SizeZ³²³⁷
- Pixels : TimeIncrement³²³⁸
- Pixels : Type³²³⁹
- Plane : TheC³²⁴⁰
- Plane : TheT³²⁴¹
- Plane : TheZ³²⁴²

³²¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³²²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³²²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³²²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³²²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³²²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³²²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³²²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³²²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³²²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³²²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³²³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³²³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³²³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³²³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³²³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³²³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³²³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³²³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³²³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

³²³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³²⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³²⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³²⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

Total supported: 24

Total unknown or missing: 451

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³²⁴³ or the previous versions³²⁴⁴ page to find documentation for the version you are using.

18.2.86 NikonElementsTiffReader

This page lists supported metadata fields for the Bio-Formats Nikon Elements TIFF format reader.

These fields are from the OME data model³²⁴⁵. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 50 of them (10%).
- Of those, Bio-Formats fully or partially converts 50 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Nikon Elements TIFF format reader:

- Channel : AcquisitionMode³²⁴⁶
- Channel : EmissionWavelength³²⁴⁷
- Channel : ExcitationWavelength³²⁴⁸
- Channel : ID³²⁴⁹
- Channel : Name³²⁵⁰
- Channel : PinholeSize³²⁵¹
- Channel : SamplesPerPixel³²⁵²
- Detector : ID³²⁵³
- Detector : Model³²⁵⁴
- Detector : Type³²⁵⁵
- DetectorSettings : Binning³²⁵⁶
- DetectorSettings : Gain³²⁵⁷
- DetectorSettings : ID³²⁵⁸
- DetectorSettings : ReadOutRate³²⁵⁹

³²⁴³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²⁴⁴<http://www.openmicroscopy.org/site/support/legacy/>

³²⁴⁵<http://www.openmicroscopy.org/site/support/ome-model/>

³²⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_AcquisitionMode

³²⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

³²⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

³²⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³²⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³²⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

³²⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³²⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³²⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³²⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³²⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

³²⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

³²⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³²⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

- DetectorSettings : Voltage³²⁶⁰
- Image : AcquisitionDate³²⁶¹
- Image : ID³²⁶²
- Image : InstrumentRef³²⁶³
- Image : Name³²⁶⁴
- ImagingEnvironment : Temperature³²⁶⁵
- Instrument : ID³²⁶⁶
- Objective : CalibratedMagnification³²⁶⁷
- Objective : Correction³²⁶⁸
- Objective : ID³²⁶⁹
- Objective : Immersion³²⁷⁰
- Objective : LensNA³²⁷¹
- Objective : Model³²⁷²
- ObjectiveSettings : ID³²⁷³
- ObjectiveSettings : RefractiveIndex³²⁷⁴
- Pixels : BigEndian³²⁷⁵
- Pixels : DimensionOrder³²⁷⁶
- Pixels : ID³²⁷⁷
- Pixels : Interleaved³²⁷⁸
- Pixels : PhysicalSizeX³²⁷⁹
- Pixels : PhysicalSizeY³²⁸⁰
- Pixels : PhysicalSizeZ³²⁸¹
- Pixels : SignificantBits³²⁸²
- Pixels : SizeC³²⁸³
- Pixels : SizeT³²⁸⁴
- Pixels : SizeX³²⁸⁵

³²⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

³²⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³²⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³²⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³²⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³²⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

³²⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³²⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

³²⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³²⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³²⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³²⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

³²⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³²⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³²⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

³²⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³²⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³²⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³²⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³²⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³²⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³²⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³²⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³²⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³²⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³²⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

- Pixels : SizeY³²⁸⁶
- Pixels : SizeZ³²⁸⁷
- Pixels : Type³²⁸⁸
- Plane : ExposureTime³²⁸⁹
- Plane : PositionX³²⁹⁰
- Plane : PositionY³²⁹¹
- Plane : PositionZ³²⁹²
- Plane : TheC³²⁹³
- Plane : TheT³²⁹⁴
- Plane : TheZ³²⁹⁵

Total supported: 50

Total unknown or missing: 425

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³²⁹⁶ or the previous versions³²⁹⁷ page to find documentation for the version you are using.

18.2.87 NikonTiffReader

This page lists supported metadata fields for the Bio-Formats Nikon TIFF format reader.

These fields are from the OME data model³²⁹⁸. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 47 of them (9%).
- Of those, Bio-Formats fully or partially converts 47 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Nikon TIFF format reader:

- Channel : EmissionWavelength³²⁹⁹
- Channel : ExcitationWavelength³³⁰⁰
- Channel : ID³³⁰¹
- Channel : PinholeSize³³⁰²

³²⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³²⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³²⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³²⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³²⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³²⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³²⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³²⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³²⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³²⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³²⁹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²⁹⁷<http://www.openmicroscopy.org/site/support/legacy/>

³²⁹⁸<http://www.openmicroscopy.org/site/support/ome-model/>

³²⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

³³⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

³³⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³³⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

- Channel : SamplesPerPixel³³⁰³
- Detector : Gain³³⁰⁴
- Detector : ID³³⁰⁵
- Detector : Type³³⁰⁶
- Dichroic : ID³³⁰⁷
- Dichroic : Model³³⁰⁸
- Filter : ID³³⁰⁹
- Filter : Model³³¹⁰
- Image : AcquisitionDate³³¹¹
- Image : Description³³¹²
- Image : ID³³¹³
- Image : InstrumentRef³³¹⁴
- Image : Name³³¹⁵
- Instrument : ID³³¹⁶
- Laser : ID³³¹⁷
- Laser : LaserMedium³³¹⁸
- Laser : Model³³¹⁹
- Laser : Type³³²⁰
- Laser : Wavelength³³²¹
- Objective : Correction³³²²
- Objective : ID³³²³
- Objective : Immersion³³²⁴
- Objective : LensNA³³²⁵
- Objective : NominalMagnification³³²⁶
- Objective : WorkingDistance³³²⁷
- ObjectiveSettings : ID³³²⁸

³³⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³³⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

³³⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³³⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³³⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

³³⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³³⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

³³¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³³¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³³¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³³¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³³¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³³¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³³¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³³¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

³³¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

³³¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³³²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

³³²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

³³²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³³²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³³²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³³²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

³³²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

³³²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

³³²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

- Pixels : BigEndian³³²⁹
- Pixels : DimensionOrder³³³⁰
- Pixels : ID³³³¹
- Pixels : Interleaved³³³²
- Pixels : PhysicalSizeX³³³³
- Pixels : PhysicalSizeY³³³⁴
- Pixels : PhysicalSizeZ³³³⁵
- Pixels : SignificantBits³³³⁶
- Pixels : SizeC³³³⁷
- Pixels : SizeT³³³⁸
- Pixels : SizeX³³³⁹
- Pixels : SizeY³³⁴⁰
- Pixels : SizeZ³³⁴¹
- Pixels : Type³³⁴²
- Plane : TheC³³⁴³
- Plane : TheT³³⁴⁴
- Plane : TheZ³³⁴⁵

Total supported: 47

Total unknown or missing: 428

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³³⁴⁶ or the previous versions³³⁴⁷ page to find documentation for the version you are using.

18.2.88 NativeND2Reader

This page lists supported metadata fields for the Bio-Formats Nikon ND2 format reader.

These fields are from the OME data model³³⁴⁸. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 52 of them (10%).

³³²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³³³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³³³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³³³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³³³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³³³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³³³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³³³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³³³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³³³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³³³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³³⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³³⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³³⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³³⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³³⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³³⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³³⁴⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³³⁴⁷<http://www.openmicroscopy.org/site/support/legacy/>

³³⁴⁸<http://www.openmicroscopy.org/site/support/ome-model/>

- Of those, Bio-Formats fully or partially converts 52 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Nikon ND2 format reader:

- Channel : AcquisitionMode³³⁴⁹
- Channel : Color³³⁵⁰
- Channel : EmissionWavelength³³⁵¹
- Channel : ExcitationWavelength³³⁵²
- Channel : ID³³⁵³
- Channel : Name³³⁵⁴
- Channel : PinholeSize³³⁵⁵
- Channel : SamplesPerPixel³³⁵⁶
- Detector : ID³³⁵⁷
- Detector : Model³³⁵⁸
- Detector : Type³³⁵⁹
- DetectorSettings : Binning³³⁶⁰
- DetectorSettings : Gain³³⁶¹
- DetectorSettings : ID³³⁶²
- DetectorSettings : ReadOutRate³³⁶³
- DetectorSettings : Voltage³³⁶⁴
- Image : AcquisitionDate³³⁶⁵
- Image : ID³³⁶⁶
- Image : InstrumentRef³³⁶⁷
- Image : Name³³⁶⁸
- ImagingEnvironment : Temperature³³⁶⁹
- Instrument : ID³³⁷⁰
- Objective : CalibratedMagnification³³⁷¹

³³⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_AcquisitionMode

³³⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

³³⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

³³⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

³³⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³³⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³³⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

³³⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³³⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³³⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³³⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³³⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

³³⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

³³⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³³⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

³³⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

³³⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³³⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³³⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³³⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³³⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

³³⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³³⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

- Objective : Correction³³⁷²
- Objective : ID³³⁷³
- Objective : Immersion³³⁷⁴
- Objective : LensNA³³⁷⁵
- Objective : Model³³⁷⁶
- ObjectiveSettings : ID³³⁷⁷
- ObjectiveSettings : RefractiveIndex³³⁷⁸
- Pixels : BigEndian³³⁷⁹
- Pixels : DimensionOrder³³⁸⁰
- Pixels : ID³³⁸¹
- Pixels : Interleaved³³⁸²
- Pixels : PhysicalSizeX³³⁸³
- Pixels : PhysicalSizeY³³⁸⁴
- Pixels : PhysicalSizeZ³³⁸⁵
- Pixels : SignificantBits³³⁸⁶
- Pixels : SizeC³³⁸⁷
- Pixels : SizeT³³⁸⁸
- Pixels : SizeX³³⁸⁹
- Pixels : SizeY³³⁹⁰
- Pixels : SizeZ³³⁹¹
- Pixels : Type³³⁹²
- Plane : DeltaT³³⁹³
- Plane : ExposureTime³³⁹⁴
- Plane : PositionX³³⁹⁵
- Plane : PositionY³³⁹⁶
- Plane : PositionZ³³⁹⁷

³³⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³³⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³³⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³³⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

³³⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³³⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³³⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

³³⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³³⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³³⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³³⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³³⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³³⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³³⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³³⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³³⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³³⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³³⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³³⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³³⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³³⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³³⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³³⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³³⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³³⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³³⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

- Plane : TheC³³⁹⁸
- Plane : TheT³³⁹⁹
- Plane : TheZ³⁴⁰⁰

Total supported: 52

Total unknown or missing: 423

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³⁴⁰¹](#) or the [previous versions³⁴⁰²](#) page to find documentation for the version you are using.

18.2.89 NRRDReader

This page lists supported metadata fields for the Bio-Formats NRRD format reader.

These fields are from the [OME data model³⁴⁰³](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats NRRD format reader:

- Channel : ID³⁴⁰⁴
- Channel : SamplesPerPixel³⁴⁰⁵
- Image : AcquisitionDate³⁴⁰⁶
- Image : ID³⁴⁰⁷
- Image : Name³⁴⁰⁸
- Pixels : BigEndian³⁴⁰⁹
- Pixels : DimensionOrder³⁴¹⁰
- Pixels : ID³⁴¹¹
- Pixels : Interleaved³⁴¹²
- Pixels : PhysicalSizeX³⁴¹³
- Pixels : PhysicalSizeY³⁴¹⁴

³³⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³³⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁴⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁴⁰¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁴⁰²<http://www.openmicroscopy.org/site/support/legacy/>

³⁴⁰³<http://www.openmicroscopy.org/site/support/ome-model/>

³⁴⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁴⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁴⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁴⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁴⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁴⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁴¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁴¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁴¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁴¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁴¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

- Pixels : PhysicalSizeZ³⁴¹⁵
- Pixels : SignificantBits³⁴¹⁶
- Pixels : SizeC³⁴¹⁷
- Pixels : SizeT³⁴¹⁸
- Pixels : SizeX³⁴¹⁹
- Pixels : SizeY³⁴²⁰
- Pixels : SizeZ³⁴²¹
- Pixels : Type³⁴²²
- Plane : TheC³⁴²³
- Plane : TheT³⁴²⁴
- Plane : TheZ³⁴²⁵

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³⁴²⁶](#) or the [previous versions³⁴²⁷](#) page to find documentation for the version you are using.

18.2.90 APLReader

This page lists supported metadata fields for the Bio-Formats Olympus APL format reader.

These fields are from the [OME data model³⁴²⁸](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 21 of them (4%).
- Of those, Bio-Formats fully or partially converts 21 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Olympus APL format reader:

- Channel : ID³⁴²⁹
- Channel : SamplesPerPixel³⁴³⁰
- Image : AcquisitionDate³⁴³¹

³⁴¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³⁴¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁴¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁴¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁴¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁴²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁴²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁴²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁴²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁴²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁴²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁴²⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁴²⁷<http://www.openmicroscopy.org/site/support/legacy/>

³⁴²⁸<http://www.openmicroscopy.org/site/support/ome-model/>

³⁴²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁴³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁴³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID³⁴³²
- Image : Name³⁴³³
- Pixels : BigEndian³⁴³⁴
- Pixels : DimensionOrder³⁴³⁵
- Pixels : ID³⁴³⁶
- Pixels : Interleaved³⁴³⁷
- Pixels : PhysicalSizeX³⁴³⁸
- Pixels : PhysicalSizeY³⁴³⁹
- Pixels : SignificantBits³⁴⁴⁰
- Pixels : SizeC³⁴⁴¹
- Pixels : SizeT³⁴⁴²
- Pixels : SizeX³⁴⁴³
- Pixels : SizeY³⁴⁴⁴
- Pixels : SizeZ³⁴⁴⁵
- Pixels : Type³⁴⁴⁶
- Plane : TheC³⁴⁴⁷
- Plane : TheT³⁴⁴⁸
- Plane : TheZ³⁴⁴⁹

Total supported: 21

Total unknown or missing: 454

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁴⁵⁰ or the previous versions³⁴⁵¹ page to find documentation for the version you are using.

18.2.91 FV1000Reader

This page lists supported metadata fields for the Bio-Formats Olympus FV1000 format reader.

These fields are from the OME data model³⁴⁵². Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- ³⁴³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ³⁴³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ³⁴³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ³⁴³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ³⁴³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ³⁴³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ³⁴³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ³⁴³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ³⁴⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ³⁴⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ³⁴⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ³⁴⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ³⁴⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ³⁴⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ³⁴⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ³⁴⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ³⁴⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ³⁴⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ³⁴⁵⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ³⁴⁵¹<http://www.openmicroscopy.org/site/support/legacy/>
- ³⁴⁵²<http://www.openmicroscopy.org/site/support/ome-model/>

- The file format itself supports 113 of them (23%).
- Of those, Bio-Formats fully or partially converts 113 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Olympus FV1000 format reader:

- Channel : EmissionWavelength³⁴⁵³
- Channel : ExcitationWavelength³⁴⁵⁴
- Channel : ID³⁴⁵⁵
- Channel : IlluminationType³⁴⁵⁶
- Channel : LightSourceSettingsID³⁴⁵⁷
- Channel : LightSourceSettingsWavelength³⁴⁵⁸
- Channel : Name³⁴⁵⁹
- Channel : SamplesPerPixel³⁴⁶⁰
- Detector : Gain³⁴⁶¹
- Detector : ID³⁴⁶²
- Detector : Type³⁴⁶³
- Detector : Voltage³⁴⁶⁴
- DetectorSettings : ID³⁴⁶⁵
- Dichroic : ID³⁴⁶⁶
- Dichroic : Model³⁴⁶⁷
- Ellipse : FontSize³⁴⁶⁸
- Ellipse : ID³⁴⁶⁹
- Ellipse : RadiusX³⁴⁷⁰
- Ellipse : RadiusY³⁴⁷¹
- Ellipse : StrokeWidth³⁴⁷²
- Ellipse : TheT³⁴⁷³
- Ellipse : TheZ³⁴⁷⁴
- Ellipse : Transform³⁴⁷⁵

³⁴⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

³⁴⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

³⁴⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁴⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_IlluminationType

³⁴⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID

³⁴⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_Wavelength

³⁴⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³⁴⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁴⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

³⁴⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³⁴⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³⁴⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Voltage

³⁴⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³⁴⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

³⁴⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁴⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³⁴⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁴⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusX

³⁴⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusY

³⁴⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁴⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁴⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁴⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

- Ellipse : X³⁴⁷⁶
- Ellipse : Y³⁴⁷⁷
- Filter : ID³⁴⁷⁸
- Filter : Model³⁴⁷⁹
- Image : AcquisitionDate³⁴⁸⁰
- Image : ID³⁴⁸¹
- Image : InstrumentRef³⁴⁸²
- Image : Name³⁴⁸³
- Image : ROIRef³⁴⁸⁴
- Instrument : ID³⁴⁸⁵
- Laser : ID³⁴⁸⁶
- Laser : LaserMedium³⁴⁸⁷
- Laser : Type³⁴⁸⁸
- Laser : Wavelength³⁴⁸⁹
- LightPath : DichroicRef³⁴⁹⁰
- LightPath : EmissionFilterRef³⁴⁹¹
- Line : FontSize³⁴⁹²
- Line : ID³⁴⁹³
- Line : StrokeWidth³⁴⁹⁴
- Line : TheT³⁴⁹⁵
- Line : TheZ³⁴⁹⁶
- Line : Transform³⁴⁹⁷
- Line : X1³⁴⁹⁸
- Line : X2³⁴⁹⁹
- Line : Y1³⁵⁰⁰
- Line : Y2³⁵⁰¹

³⁴⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_X

³⁴⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_Y

³⁴⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

³⁴⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁴⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁴⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁴⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³⁴⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁴⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

³⁴⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁴⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

³⁴⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

³⁴⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

³⁴⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

³⁴⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID

³⁴⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

³⁴⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³⁴⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁴⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁴⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁴⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁴⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

³⁴⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X1

³⁴⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X2

³⁵⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y1

³⁵⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y2

- Objective : Correction³⁵⁰²
- Objective : ID³⁵⁰³
- Objective : Immersion³⁵⁰⁴
- Objective : LensNA³⁵⁰⁵
- Objective : Model³⁵⁰⁶
- Objective : NominalMagnification³⁵⁰⁷
- Objective : WorkingDistance³⁵⁰⁸
- ObjectiveSettings : ID³⁵⁰⁹
- Pixels : BigEndian³⁵¹⁰
- Pixels : DimensionOrder³⁵¹¹
- Pixels : ID³⁵¹²
- Pixels : Interleaved³⁵¹³
- Pixels : PhysicalSizeX³⁵¹⁴
- Pixels : PhysicalSizeY³⁵¹⁵
- Pixels : PhysicalSizeZ³⁵¹⁶
- Pixels : SignificantBits³⁵¹⁷
- Pixels : SizeC³⁵¹⁸
- Pixels : SizeT³⁵¹⁹
- Pixels : SizeX³⁵²⁰
- Pixels : SizeY³⁵²¹
- Pixels : SizeZ³⁵²²
- Pixels : TimeIncrement³⁵²³
- Pixels : Type³⁵²⁴
- Plane : DeltaT³⁵²⁵
- Plane : PositionX³⁵²⁶
- Plane : PositionY³⁵²⁷

³⁵⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³⁵⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³⁵⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³⁵⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

³⁵⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁵⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

³⁵⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

³⁵⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³⁵¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁵¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁵¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁵¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁵¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁵¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁵¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³⁵¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁵¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁵¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁵²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁵²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁵²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁵²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

³⁵²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁵²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³⁵²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁵²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

- Plane : PositionZ³⁵²⁸
- Plane : TheC³⁵²⁹
- Plane : TheT³⁵³⁰
- Plane : TheZ³⁵³¹
- Point : FontSize³⁵³²
- Point : ID³⁵³³
- Point : StrokeWidth³⁵³⁴
- Point : TheT³⁵³⁵
- Point : TheZ³⁵³⁶
- Point : X³⁵³⁷
- Point : Y³⁵³⁸
- Polygon : FontSize³⁵³⁹
- Polygon : ID³⁵⁴⁰
- Polygon : Points³⁵⁴¹
- Polygon : StrokeWidth³⁵⁴²
- Polygon : TheT³⁵⁴³
- Polygon : TheZ³⁵⁴⁴
- Polygon : Transform³⁵⁴⁵
- Polyline : FontSize³⁵⁴⁶
- Polyline : ID³⁵⁴⁷
- Polyline : Points³⁵⁴⁸
- Polyline : StrokeWidth³⁵⁴⁹
- Polyline : TheT³⁵⁵⁰
- Polyline : TheZ³⁵⁵¹
- Polyline : Transform³⁵⁵²
- ROI : ID³⁵⁵³

³⁵²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³⁵²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁵³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁵³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁵³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³⁵³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁵³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁵³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁵³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁵³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_X

³⁵³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_Y

³⁵³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³⁵⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁵⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

³⁵⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁵⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁵⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁵⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

³⁵⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³⁵⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁵⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polyline_Points

³⁵⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁵⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁵⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁵⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

³⁵⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

- Rectangle : FontSize³⁵⁵⁴
- Rectangle : Height³⁵⁵⁵
- Rectangle : ID³⁵⁵⁶
- Rectangle : StrokeWidth³⁵⁵⁷
- Rectangle : TheT³⁵⁵⁸
- Rectangle : TheZ³⁵⁵⁹
- Rectangle : Transform³⁵⁶⁰
- Rectangle : Width³⁵⁶¹
- Rectangle : X³⁵⁶²
- Rectangle : Y³⁵⁶³
- TransmittanceRange : CutIn³⁵⁶⁴
- TransmittanceRange : CutOut³⁵⁶⁵

Total supported: 113

Total unknown or missing: 362

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁵⁶⁶ or the previous versions³⁵⁶⁷ page to find documentation for the version you are using.

18.2.92 FluoviewReader

This page lists supported metadata fields for the Bio-Formats Olympus Fluoview/ABD TIFF format reader.

These fields are from the OME data model³⁵⁶⁸. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 49 of them (10%).
- Of those, Bio-Formats fully or partially converts 49 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Olympus Fluoview/ABD TIFF format reader:

- Channel : ID³⁵⁶⁹
- Channel : Name³⁵⁷⁰

³⁵⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³⁵⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

³⁵⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁵⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁵⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁵⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁵⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

³⁵⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

³⁵⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

³⁵⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

³⁵⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn

³⁵⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut

³⁵⁶⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵⁶⁷<http://www.openmicroscopy.org/site/support/legacy/>

³⁵⁶⁸<http://www.openmicroscopy.org/site/support/ome-model/>

³⁵⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁵⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

- Channel : SamplesPerPixel³⁵⁷¹
- Detector : ID³⁵⁷²
- Detector : Manufacturer³⁵⁷³
- Detector : Model³⁵⁷⁴
- Detector : Type³⁵⁷⁵
- DetectorSettings : Gain³⁵⁷⁶
- DetectorSettings : ID³⁵⁷⁷
- DetectorSettings : Offset³⁵⁷⁸
- DetectorSettings : ReadOutRate³⁵⁷⁹
- DetectorSettings : Voltage³⁵⁸⁰
- Image : AcquisitionDate³⁵⁸¹
- Image : Description³⁵⁸²
- Image : ID³⁵⁸³
- Image : InstrumentRef³⁵⁸⁴
- Image : Name³⁵⁸⁵
- ImagingEnvironment : Temperature³⁵⁸⁶
- Instrument : ID³⁵⁸⁷
- Objective : CalibratedMagnification³⁵⁸⁸
- Objective : Correction³⁵⁸⁹
- Objective : ID³⁵⁹⁰
- Objective : Immersion³⁵⁹¹
- Objective : LensNA³⁵⁹²
- Objective : Model³⁵⁹³
- ObjectiveSettings : ID³⁵⁹⁴
- Pixels : BigEndian³⁵⁹⁵
- Pixels : DimensionOrder³⁵⁹⁶

³⁵⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁵⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³⁵⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

³⁵⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁵⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³⁵⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

³⁵⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³⁵⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

³⁵⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

³⁵⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

³⁵⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁵⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³⁵⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁵⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³⁵⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁵⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

³⁵⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁵⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

³⁵⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³⁵⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³⁵⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³⁵⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

³⁵⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁵⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³⁵⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁵⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID³⁵⁹⁷
- Pixels : Interleaved³⁵⁹⁸
- Pixels : PhysicalSizeX³⁵⁹⁹
- Pixels : PhysicalSizeY³⁶⁰⁰
- Pixels : PhysicalSizeZ³⁶⁰¹
- Pixels : SignificantBits³⁶⁰²
- Pixels : SizeC³⁶⁰³
- Pixels : SizeT³⁶⁰⁴
- Pixels : SizeX³⁶⁰⁵
- Pixels : SizeY³⁶⁰⁶
- Pixels : SizeZ³⁶⁰⁷
- Pixels : TimeIncrement³⁶⁰⁸
- Pixels : Type³⁶⁰⁹
- Plane : DeltaT³⁶¹⁰
- Plane : ExposureTime³⁶¹¹
- Plane : PositionX³⁶¹²
- Plane : PositionY³⁶¹³
- Plane : PositionZ³⁶¹⁴
- Plane : TheC³⁶¹⁵
- Plane : TheT³⁶¹⁶
- Plane : TheZ³⁶¹⁷

Total supported: 49

Total unknown or missing: 426

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁶¹⁸ or the previous versions³⁶¹⁹ page to find documentation for the version you are using.

³⁵⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁵⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁵⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁶⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁶⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³⁶⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁶⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁶⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁶⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁶⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁶⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁶⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

³⁶⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁶¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³⁶¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁶¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁶¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³⁶¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³⁶¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁶¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁶¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁶¹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁶¹⁹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.93 ScanrReader

This page lists supported metadata fields for the Bio-Formats Olympus ScanR format reader.

These fields are from the [OME data model](#)³⁶²⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 43 of them (9%).
- Of those, Bio-Formats fully or partially converts 43 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Olympus ScanR format reader:

- Channel : ID³⁶²¹
- Channel : Name³⁶²²
- Channel : SamplesPerPixel³⁶²³
- Image : AcquisitionDate³⁶²⁴
- Image : ID³⁶²⁵
- Image : Name³⁶²⁶
- Pixels : BigEndian³⁶²⁷
- Pixels : DimensionOrder³⁶²⁸
- Pixels : ID³⁶²⁹
- Pixels : Interleaved³⁶³⁰
- Pixels : PhysicalSizeX³⁶³¹
- Pixels : PhysicalSizeY³⁶³²
- Pixels : SignificantBits³⁶³³
- Pixels : SizeC³⁶³⁴
- Pixels : SizeT³⁶³⁵
- Pixels : SizeX³⁶³⁶
- Pixels : SizeY³⁶³⁷
- Pixels : SizeZ³⁶³⁸
- Pixels : Type³⁶³⁹

³⁶²⁰<http://www.openmicroscopy.org/site/support/ome-model/>

³⁶²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁶²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³⁶²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁶²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁶²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁶²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁶²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁶²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁶²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁶³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁶³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁶³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁶³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁶³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁶³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁶³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁶³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁶³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁶³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : DeltaT³⁶⁴⁰
- Plane : ExposureTime³⁶⁴¹
- Plane : PositionX³⁶⁴²
- Plane : PositionY³⁶⁴³
- Plane : TheC³⁶⁴⁴
- Plane : TheT³⁶⁴⁵
- Plane : TheZ³⁶⁴⁶
- Plate : ColumnNamingConvention³⁶⁴⁷
- Plate : Columns³⁶⁴⁸
- Plate : ID³⁶⁴⁹
- Plate : Name³⁶⁵⁰
- Plate : RowNamingConvention³⁶⁵¹
- Plate : Rows³⁶⁵²
- PlateAcquisition : ID³⁶⁵³
- PlateAcquisition : MaximumFieldCount³⁶⁵⁴
- PlateAcquisition : WellSampleRef³⁶⁵⁵
- Well : Column³⁶⁵⁶
- Well : ID³⁶⁵⁷
- Well : Row³⁶⁵⁸
- WellSample : ID³⁶⁵⁹
- WellSample : ImageRef³⁶⁶⁰
- WellSample : Index³⁶⁶¹
- WellSample : PositionX³⁶⁶²
- WellSample : PositionY³⁶⁶³

Total supported: 43

Total unknown or missing: 432

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁶⁶⁴ or the previous

³⁶⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³⁶⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁶⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁶⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³⁶⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁶⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁶⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁶⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

³⁶⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Columns

³⁶⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

³⁶⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

³⁶⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

³⁶⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Rows

³⁶⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

³⁶⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

³⁶⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

³⁶⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

³⁶⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

³⁶⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

³⁶⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

³⁶⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

³⁶⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

³⁶⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

³⁶⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

[versions³⁶⁶⁵](#) page to find documentation for the version you are using.

18.2.94 SISReader

This page lists supported metadata fields for the Bio-Formats Olympus SIS TIFF format reader.

These fields are from the [OME data model³⁶⁶⁶](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 33 of them (6%).
- Of those, Bio-Formats fully or partially converts 33 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Olympus SIS TIFF format reader:

- Channel : ID³⁶⁶⁷
- Channel : Name³⁶⁶⁸
- Channel : SamplesPerPixel³⁶⁶⁹
- Detector : ID³⁶⁷⁰
- Detector : Model³⁶⁷¹
- Detector : Type³⁶⁷²
- DetectorSettings : ID³⁶⁷³
- Image : AcquisitionDate³⁶⁷⁴
- Image : ID³⁶⁷⁵
- Image : InstrumentRef³⁶⁷⁶
- Image : Name³⁶⁷⁷
- Instrument : ID³⁶⁷⁸
- Objective : Correction³⁶⁷⁹
- Objective : ID³⁶⁸⁰
- Objective : Immersion³⁶⁸¹
- Objective : NominalMagnification³⁶⁸²

³⁶⁶⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁶⁶⁵<http://www.openmicroscopy.org/site/support/legacy/>

³⁶⁶⁶<http://www.openmicroscopy.org/site/support/ome-model/>

³⁶⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁶⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³⁶⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁶⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³⁶⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁶⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³⁶⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³⁶⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁶⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁶⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³⁶⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁶⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁶⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³⁶⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³⁶⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³⁶⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

- ObjectiveSettings : ID³⁶⁸³
- Pixels : BigEndian³⁶⁸⁴
- Pixels : DimensionOrder³⁶⁸⁵
- Pixels : ID³⁶⁸⁶
- Pixels : Interleaved³⁶⁸⁷
- Pixels : PhysicalSizeX³⁶⁸⁸
- Pixels : PhysicalSizeY³⁶⁸⁹
- Pixels : SignificantBits³⁶⁹⁰
- Pixels : SizeC³⁶⁹¹
- Pixels : SizeT³⁶⁹²
- Pixels : SizeX³⁶⁹³
- Pixels : SizeY³⁶⁹⁴
- Pixels : SizeZ³⁶⁹⁵
- Pixels : Type³⁶⁹⁶
- Plane : TheC³⁶⁹⁷
- Plane : TheT³⁶⁹⁸
- Plane : TheZ³⁶⁹⁹

Total supported: 33

Total unknown or missing: 442

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁷⁰⁰ or the previous versions³⁷⁰¹ page to find documentation for the version you are using.

18.2.95 OMETiffReader

This page lists supported metadata fields for the Bio-Formats OME-TIFF format reader.

These fields are from the OME data model³⁷⁰². Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).

³⁶⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³⁶⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁶⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁶⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁶⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁶⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁶⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁶⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁶⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁶⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁶⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁶⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁶⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁶⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁶⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁶⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁶⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁷⁰⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷⁰¹<http://www.openmicroscopy.org/site/support/legacy/>

³⁷⁰²<http://www.openmicroscopy.org/site/support/ome-model/>

- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats OME-TIFF format reader:

- Channel : ID³⁷⁰³
- Channel : SamplesPerPixel³⁷⁰⁴
- Image : AcquisitionDate³⁷⁰⁵
- Image : ID³⁷⁰⁶
- Image : Name³⁷⁰⁷
- Pixels : BigEndian³⁷⁰⁸
- Pixels : DimensionOrder³⁷⁰⁹
- Pixels : ID³⁷¹⁰
- Pixels : Interleaved³⁷¹¹
- Pixels : SignificantBits³⁷¹²
- Pixels : SizeC³⁷¹³
- Pixels : SizeT³⁷¹⁴
- Pixels : SizeX³⁷¹⁵
- Pixels : SizeY³⁷¹⁶
- Pixels : SizeZ³⁷¹⁷
- Pixels : Type³⁷¹⁸
- Plane : TheC³⁷¹⁹
- Plane : TheT³⁷²⁰
- Plane : TheZ³⁷²¹

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁷²² or the previous versions³⁷²³ page to find documentation for the version you are using.

³⁷⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID
³⁷⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel
³⁷⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate
³⁷⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
³⁷⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
³⁷⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
³⁷⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
³⁷¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
³⁷¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
³⁷¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
³⁷¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
³⁷¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
³⁷¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
³⁷¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
³⁷¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
³⁷¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
³⁷¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
³⁷²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
³⁷²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
³⁷²²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
³⁷²³<http://www.openmicroscopy.org/site/support/legacy/>

18.2.96 OMEXMLReader

This page lists supported metadata fields for the Bio-Formats OME-XML format reader.

These fields are from the [OME data model](#)³⁷²⁴. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats OME-XML format reader:

- Channel : ID³⁷²⁵
- Channel : SamplesPerPixel³⁷²⁶
- Image : AcquisitionDate³⁷²⁷
- Image : ID³⁷²⁸
- Image : Name³⁷²⁹
- Pixels : BigEndian³⁷³⁰
- Pixels : DimensionOrder³⁷³¹
- Pixels : ID³⁷³²
- Pixels : Interleaved³⁷³³
- Pixels : SignificantBits³⁷³⁴
- Pixels : SizeC³⁷³⁵
- Pixels : SizeT³⁷³⁶
- Pixels : SizeX³⁷³⁷
- Pixels : SizeY³⁷³⁸
- Pixels : SizeZ³⁷³⁹
- Pixels : Type³⁷⁴⁰
- Plane : TheC³⁷⁴¹
- Plane : TheT³⁷⁴²

³⁷²⁴<http://www.openmicroscopy.org/site/support/ome-model/>

³⁷²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁷²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁷²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁷²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁷²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁷³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁷³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁷³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁷³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁷³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁷³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁷³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁷³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁷³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁷³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁷⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁷⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁷⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ³⁷⁴³

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³⁷⁴⁴](#) or the [previous versions³⁷⁴⁵](#) page to find documentation for the version you are using.

18.2.97 OxfordInstrumentsReader

This page lists supported metadata fields for the Bio-Formats Oxford Instruments format reader.

These fields are from the [OME data model³⁷⁴⁶](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Oxford Instruments format reader:

- Channel : ID³⁷⁴⁷
- Channel : SamplesPerPixel³⁷⁴⁸
- Image : AcquisitionDate³⁷⁴⁹
- Image : Description³⁷⁵⁰
- Image : ID³⁷⁵¹
- Image : Name³⁷⁵²
- Pixels : BigEndian³⁷⁵³
- Pixels : DimensionOrder³⁷⁵⁴
- Pixels : ID³⁷⁵⁵
- Pixels : Interleaved³⁷⁵⁶
- Pixels : PhysicalSizeX³⁷⁵⁷
- Pixels : PhysicalSizeY³⁷⁵⁸
- Pixels : SignificantBits³⁷⁵⁹

³⁷⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁷⁴⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷⁴⁵<http://www.openmicroscopy.org/site/support/legacy/>

³⁷⁴⁶<http://www.openmicroscopy.org/site/support/ome-model/>

³⁷⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁷⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁷⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁷⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³⁷⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁷⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁷⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁷⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁷⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁷⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁷⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁷⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁷⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

- Pixels : SizeC³⁷⁶⁰
- Pixels : SizeT³⁷⁶¹
- Pixels : SizeX³⁷⁶²
- Pixels : SizeY³⁷⁶³
- Pixels : SizeZ³⁷⁶⁴
- Pixels : Type³⁷⁶⁵
- Plane : TheC³⁷⁶⁶
- Plane : TheT³⁷⁶⁷
- Plane : TheZ³⁷⁶⁸

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³⁷⁶⁹](#) or the [previous versions³⁷⁷⁰](#) page to find documentation for the version you are using.

18.2.98 PCORAWReader

This page lists supported metadata fields for the Bio-Formats PCO-RAW format reader.

These fields are from the [OME data model³⁷⁷¹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 26 of them (5%).
- Of those, Bio-Formats fully or partially converts 26 (100%).

Supported fields

These fields are fully supported by the Bio-Formats PCO-RAW format reader:

- Channel : ID³⁷⁷²
- Channel : SamplesPerPixel³⁷⁷³
- Detector : ID³⁷⁷⁴
- Detector : SerialNumber³⁷⁷⁵
- DetectorSettings : Binning³⁷⁷⁶

³⁷⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁷⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁷⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁷⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁷⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁷⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁷⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁷⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁷⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁷⁶⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷⁷⁰<http://www.openmicroscopy.org/site/support/legacy/>

³⁷⁷¹<http://www.openmicroscopy.org/site/support/ome-model/>

³⁷⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁷⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁷⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³⁷⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

³⁷⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

- DetectorSettings : ID³⁷⁷⁷
- Image : AcquisitionDate³⁷⁷⁸
- Image : Description³⁷⁷⁹
- Image : ID³⁷⁸⁰
- Image : Name³⁷⁸¹
- Instrument : ID³⁷⁸²
- Pixels : BigEndian³⁷⁸³
- Pixels : DimensionOrder³⁷⁸⁴
- Pixels : ID³⁷⁸⁵
- Pixels : Interleaved³⁷⁸⁶
- Pixels : SignificantBits³⁷⁸⁷
- Pixels : SizeC³⁷⁸⁸
- Pixels : SizeT³⁷⁸⁹
- Pixels : SizeX³⁷⁹⁰
- Pixels : SizeY³⁷⁹¹
- Pixels : SizeZ³⁷⁹²
- Pixels : Type³⁷⁹³
- Plane : ExposureTime³⁷⁹⁴
- Plane : TheC³⁷⁹⁵
- Plane : TheT³⁷⁹⁶
- Plane : TheZ³⁷⁹⁷

Total supported: 26

Total unknown or missing: 449

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁷⁹⁸ or the previous versions³⁷⁹⁹ page to find documentation for the version you are using.

³⁷⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³⁷⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁷⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³⁷⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁷⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁷⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁷⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁷⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁷⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁷⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁷⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁷⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁷⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁷⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁷⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁷⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁷⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁷⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁷⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁷⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁷⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁷⁹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷⁹⁹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.99 PCXReader

This page lists supported metadata fields for the Bio-Formats PCX format reader.

These fields are from the [OME data model](#)³⁸⁰⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats PCX format reader:

- Channel : ID³⁸⁰¹
- Channel : SamplesPerPixel³⁸⁰²
- Image : AcquisitionDate³⁸⁰³
- Image : ID³⁸⁰⁴
- Image : Name³⁸⁰⁵
- Pixels : BigEndian³⁸⁰⁶
- Pixels : DimensionOrder³⁸⁰⁷
- Pixels : ID³⁸⁰⁸
- Pixels : Interleaved³⁸⁰⁹
- Pixels : SignificantBits³⁸¹⁰
- Pixels : SizeC³⁸¹¹
- Pixels : SizeT³⁸¹²
- Pixels : SizeX³⁸¹³
- Pixels : SizeY³⁸¹⁴
- Pixels : SizeZ³⁸¹⁵
- Pixels : Type³⁸¹⁶
- Plane : TheC³⁸¹⁷
- Plane : TheT³⁸¹⁸

³⁸⁰⁰<http://www.openmicroscopy.org/site/support/ome-model/>

³⁸⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁸⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁸⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁸⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁸⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁸⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁸⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁸⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁸⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁸¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁸¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁸¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁸¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁸¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁸¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁸¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁸¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁸¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ³⁸¹⁹

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³⁸²⁰](#) or the [previous versions³⁸²¹](#) page to find documentation for the version you are using.

18.2.100 PDSReader

This page lists supported metadata fields for the Bio-Formats Perkin Elmer Densitometer format reader.

These fields are from the [OME data model³⁸²²](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 23 of them (4%).
- Of those, Bio-Formats fully or partially converts 23 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Perkin Elmer Densitometer format reader:

- Channel : ID³⁸²³
- Channel : SamplesPerPixel³⁸²⁴
- Image : AcquisitionDate³⁸²⁵
- Image : ID³⁸²⁶
- Image : Name³⁸²⁷
- Pixels : BigEndian³⁸²⁸
- Pixels : DimensionOrder³⁸²⁹
- Pixels : ID³⁸³⁰
- Pixels : Interleaved³⁸³¹
- Pixels : PhysicalSizeX³⁸³²
- Pixels : PhysicalSizeY³⁸³³
- Pixels : SignificantBits³⁸³⁴
- Pixels : SizeC³⁸³⁵

³⁸¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁸²⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁸²¹<http://www.openmicroscopy.org/site/support/legacy/>

³⁸²²<http://www.openmicroscopy.org/site/support/ome-model/>

³⁸²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁸²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁸²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁸²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁸²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁸²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁸²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁸³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁸³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁸³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁸³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁸³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁸³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT³⁸³⁶
- Pixels : SizeX³⁸³⁷
- Pixels : SizeY³⁸³⁸
- Pixels : SizeZ³⁸³⁹
- Pixels : Type³⁸⁴⁰
- Plane : PositionX³⁸⁴¹
- Plane : PositionY³⁸⁴²
- Plane : TheC³⁸⁴³
- Plane : TheT³⁸⁴⁴
- Plane : TheZ³⁸⁴⁵

Total supported: 23

Total unknown or missing: 452

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³⁸⁴⁶](#) or the [previous versions³⁸⁴⁷](#) page to find documentation for the version you are using.

18.2.101 IM3Reader

This page lists supported metadata fields for the Bio-Formats Perkin-Elmer Nuance IM3 format reader.

These fields are from the [OME data model³⁸⁴⁸](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Perkin-Elmer Nuance IM3 format reader:

- Channel : ID³⁸⁴⁹
- Channel : SamplesPerPixel³⁸⁵⁰
- Image : AcquisitionDate³⁸⁵¹
- Image : ID³⁸⁵²

³⁸³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁸³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁸³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁸³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁸⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁸⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁸⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³⁸⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁸⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁸⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁸⁴⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁸⁴⁷<http://www.openmicroscopy.org/site/support/legacy/>

³⁸⁴⁸<http://www.openmicroscopy.org/site/support/ome-model/>

³⁸⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁸⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁸⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁸⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name³⁸⁵³
- Pixels : BigEndian³⁸⁵⁴
- Pixels : DimensionOrder³⁸⁵⁵
- Pixels : ID³⁸⁵⁶
- Pixels : Interleaved³⁸⁵⁷
- Pixels : SignificantBits³⁸⁵⁸
- Pixels : SizeC³⁸⁵⁹
- Pixels : SizeT³⁸⁶⁰
- Pixels : SizeX³⁸⁶¹
- Pixels : SizeY³⁸⁶²
- Pixels : SizeZ³⁸⁶³
- Pixels : Type³⁸⁶⁴
- Plane : TheC³⁸⁶⁵
- Plane : TheT³⁸⁶⁶
- Plane : TheZ³⁸⁶⁷

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁸⁶⁸ or the previous versions³⁸⁶⁹ page to find documentation for the version you are using.

18.2.102 OperettaReader

This page lists supported metadata fields for the Bio-Formats PerkinElmer Operetta format reader.

These fields are from the OME data model³⁸⁷⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 43 of them (9%).
- Of those, Bio-Formats fully or partially converts 43 (100%).

³⁸⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁸⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁸⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁸⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁸⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁸⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁸⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁸⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁸⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁸⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁸⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁸⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁸⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁸⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁸⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁸⁶⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁸⁶⁹<http://www.openmicroscopy.org/site/support/legacy/>

³⁸⁷⁰<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats PerkinElmer Operetta format reader:

- Channel : ID³⁸⁷¹
- Channel : Name³⁸⁷²
- Channel : SamplesPerPixel³⁸⁷³
- Experimenter : ID³⁸⁷⁴
- Experimenter : LastName³⁸⁷⁵
- Image : AcquisitionDate³⁸⁷⁶
- Image : ExperimenterRef³⁸⁷⁷
- Image : ID³⁸⁷⁸
- Image : Name³⁸⁷⁹
- Pixels : BigEndian³⁸⁸⁰
- Pixels : DimensionOrder³⁸⁸¹
- Pixels : ID³⁸⁸²
- Pixels : Interleaved³⁸⁸³
- Pixels : PhysicalSizeX³⁸⁸⁴
- Pixels : PhysicalSizeY³⁸⁸⁵
- Pixels : SignificantBits³⁸⁸⁶
- Pixels : SizeC³⁸⁸⁷
- Pixels : SizeT³⁸⁸⁸
- Pixels : SizeX³⁸⁸⁹
- Pixels : SizeY³⁸⁹⁰
- Pixels : SizeZ³⁸⁹¹
- Pixels : Type³⁸⁹²
- Plane : PositionX³⁸⁹³
- Plane : PositionY³⁸⁹⁴

³⁸⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁸⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³⁸⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁸⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

³⁸⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

³⁸⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁸⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ExperimenterRef_ID

³⁸⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁸⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁸⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁸⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁸⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁸⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁸⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁸⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁸⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁸⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁸⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁸⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁸⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁸⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁸⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁸⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁸⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

- Plane : PositionZ³⁸⁹⁵
- Plane : TheC³⁸⁹⁶
- Plane : TheT³⁸⁹⁷
- Plane : TheZ³⁸⁹⁸
- Plate : Columns³⁸⁹⁹
- Plate : Description³⁹⁰⁰
- Plate : ExternalIdentifier³⁹⁰¹
- Plate : ID³⁹⁰²
- Plate : Name³⁹⁰³
- Plate : Rows³⁹⁰⁴
- PlateAcquisition : ID³⁹⁰⁵
- PlateAcquisition : MaximumFieldCount³⁹⁰⁶
- PlateAcquisition : WellSampleRef³⁹⁰⁷
- Well : Column³⁹⁰⁸
- Well : ID³⁹⁰⁹
- Well : Row³⁹¹⁰
- WellSample : ID³⁹¹¹
- WellSample : ImageRef³⁹¹²
- WellSample : Index³⁹¹³

Total supported: 43

Total unknown or missing: 432

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁹¹⁴ or the previous versions³⁹¹⁵ page to find documentation for the version you are using.

18.2.103 PerkinElmerReader

This page lists supported metadata fields for the Bio-Formats PerkinElmer format reader.

³⁸⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³⁸⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁸⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁸⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁸⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Columns

³⁹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Description

³⁹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ExternalIdentifier

³⁹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

³⁹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

³⁹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Rows

³⁹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

³⁹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

³⁹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

³⁹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

³⁹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

³⁹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

³⁹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

³⁹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

³⁹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

³⁹¹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹¹⁵<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)³⁹¹⁶. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 30 of them (6%).
- Of those, Bio-Formats fully or partially converts 30 (100%).

Supported fields

These fields are fully supported by the Bio-Formats PerkinElmer format reader:

- Channel : EmissionWavelength³⁹¹⁷
- Channel : ExcitationWavelength³⁹¹⁸
- Channel : ID³⁹¹⁹
- Channel : SamplesPerPixel³⁹²⁰
- Image : AcquisitionDate³⁹²¹
- Image : ID³⁹²²
- Image : InstrumentRef³⁹²³
- Image : Name³⁹²⁴
- Instrument : ID³⁹²⁵
- Pixels : BigEndian³⁹²⁶
- Pixels : DimensionOrder³⁹²⁷
- Pixels : ID³⁹²⁸
- Pixels : Interleaved³⁹²⁹
- Pixels : PhysicalSizeX³⁹³⁰
- Pixels : PhysicalSizeY³⁹³¹
- Pixels : SignificantBits³⁹³²
- Pixels : SizeC³⁹³³
- Pixels : SizeT³⁹³⁴
- Pixels : SizeX³⁹³⁵
- Pixels : SizeY³⁹³⁶

³⁹¹⁶<http://www.openmicroscopy.org/site/support/ome-model/>

³⁹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

³⁹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

³⁹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³⁹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ³⁹³⁷
- Pixels : Type³⁹³⁸
- Plane : DeltaT³⁹³⁹
- Plane : ExposureTime³⁹⁴⁰
- Plane : PositionX³⁹⁴¹
- Plane : PositionY³⁹⁴²
- Plane : PositionZ³⁹⁴³
- Plane : TheC³⁹⁴⁴
- Plane : TheT³⁹⁴⁵
- Plane : TheZ³⁹⁴⁶

Total supported: 30

Total unknown or missing: 445

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³⁹⁴⁷](#) or the [previous versions³⁹⁴⁸](#) page to find documentation for the version you are using.

18.2.104 PGMReader

This page lists supported metadata fields for the Bio-Formats Portable Any Map format reader.

These fields are from the [OME data model³⁹⁴⁹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Portable Any Map format reader:

- Channel : ID³⁹⁵⁰
- Channel : SamplesPerPixel³⁹⁵¹
- Image : AcquisitionDate³⁹⁵²
- Image : ID³⁹⁵³

³⁹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³⁹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³⁹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³⁹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁹⁴⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹⁴⁸<http://www.openmicroscopy.org/site/support/legacy/>

³⁹⁴⁹<http://www.openmicroscopy.org/site/support/ome-model/>

³⁹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name³⁹⁵⁴
- Pixels : BigEndian³⁹⁵⁵
- Pixels : DimensionOrder³⁹⁵⁶
- Pixels : ID³⁹⁵⁷
- Pixels : Interleaved³⁹⁵⁸
- Pixels : SignificantBits³⁹⁵⁹
- Pixels : SizeC³⁹⁶⁰
- Pixels : SizeT³⁹⁶¹
- Pixels : SizeX³⁹⁶²
- Pixels : SizeY³⁹⁶³
- Pixels : SizeZ³⁹⁶⁴
- Pixels : Type³⁹⁶⁵
- Plane : TheC³⁹⁶⁶
- Plane : TheT³⁹⁶⁷
- Plane : TheZ³⁹⁶⁸

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁹⁶⁹ or the previous versions³⁹⁷⁰ page to find documentation for the version you are using.

18.2.105 PSDReader

This page lists supported metadata fields for the Bio-Formats Adobe Photoshop format reader.

These fields are from the OME data model³⁹⁷¹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

³⁹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁹⁶⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹⁷⁰<http://www.openmicroscopy.org/site/support/legacy/>

³⁹⁷¹<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Adobe Photoshop format reader:

- Channel : ID³⁹⁷²
- Channel : SamplesPerPixel³⁹⁷³
- Image : AcquisitionDate³⁹⁷⁴
- Image : ID³⁹⁷⁵
- Image : Name³⁹⁷⁶
- Pixels : BigEndian³⁹⁷⁷
- Pixels : DimensionOrder³⁹⁷⁸
- Pixels : ID³⁹⁷⁹
- Pixels : Interleaved³⁹⁸⁰
- Pixels : SignificantBits³⁹⁸¹
- Pixels : SizeC³⁹⁸²
- Pixels : SizeT³⁹⁸³
- Pixels : SizeX³⁹⁸⁴
- Pixels : SizeY³⁹⁸⁵
- Pixels : SizeZ³⁹⁸⁶
- Pixels : Type³⁹⁸⁷
- Plane : TheC³⁹⁸⁸
- Plane : TheT³⁹⁸⁹
- Plane : TheZ³⁹⁹⁰

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁹⁹¹ or the previous versions³⁹⁹² page to find documentation for the version you are using.

³⁹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁹⁹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹⁹²<http://www.openmicroscopy.org/site/support/legacy/>

18.2.106 PhotoshopTiffReader

This page lists supported metadata fields for the Bio-Formats Adobe Photoshop TIFF format reader.

These fields are from the [OME data model](#)³⁹⁹³. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Adobe Photoshop TIFF format reader:

- Channel : ID³⁹⁹⁴
- Channel : SamplesPerPixel³⁹⁹⁵
- Image : AcquisitionDate³⁹⁹⁶
- Image : ID³⁹⁹⁷
- Image : Name³⁹⁹⁸
- Pixels : BigEndian³⁹⁹⁹
- Pixels : DimensionOrder⁴⁰⁰⁰
- Pixels : ID⁴⁰⁰¹
- Pixels : Interleaved⁴⁰⁰²
- Pixels : SignificantBits⁴⁰⁰³
- Pixels : SizeC⁴⁰⁰⁴
- Pixels : SizeT⁴⁰⁰⁵
- Pixels : SizeX⁴⁰⁰⁶
- Pixels : SizeY⁴⁰⁰⁷
- Pixels : SizeZ⁴⁰⁰⁸
- Pixels : Type⁴⁰⁰⁹
- Plane : TheC⁴⁰¹⁰
- Plane : TheT⁴⁰¹¹

³⁹⁹³<http://www.openmicroscopy.org/site/support/ome-model/>

³⁹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁰⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁰⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁰⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁰⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁰⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁰⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁰⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁰⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁰⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁰⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁰¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁰¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ⁴⁰¹²

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴⁰¹³](#) or the [previous versions⁴⁰¹⁴](#) page to find documentation for the version you are using.

18.2.107 PQBinReader

This page lists supported metadata fields for the Bio-Formats PicoQuant Bin format reader.

These fields are from the [OME data model⁴⁰¹⁵](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 21 of them (4%).
- Of those, Bio-Formats fully or partially converts 21 (100%).

Supported fields

These fields are fully supported by the Bio-Formats PicoQuant Bin format reader:

- Channel : ID⁴⁰¹⁶
- Channel : SamplesPerPixel⁴⁰¹⁷
- Image : AcquisitionDate⁴⁰¹⁸
- Image : ID⁴⁰¹⁹
- Image : Name⁴⁰²⁰
- Pixels : BigEndian⁴⁰²¹
- Pixels : DimensionOrder⁴⁰²²
- Pixels : ID⁴⁰²³
- Pixels : Interleaved⁴⁰²⁴
- Pixels : PhysicalSizeX⁴⁰²⁵
- Pixels : PhysicalSizeY⁴⁰²⁶
- Pixels : SignificantBits⁴⁰²⁷
- Pixels : SizeC⁴⁰²⁸

⁴⁰¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁰¹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰¹⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰¹⁵<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁰¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁰¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁰¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁰¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁰²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁰²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁰²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁰²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁰²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁰²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁰²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁰²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁰²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT⁴⁰²⁹
- Pixels : SizeX⁴⁰³⁰
- Pixels : SizeY⁴⁰³¹
- Pixels : SizeZ⁴⁰³²
- Pixels : Type⁴⁰³³
- Plane : TheC⁴⁰³⁴
- Plane : TheT⁴⁰³⁵
- Plane : TheZ⁴⁰³⁶

Total supported: 21

Total unknown or missing: 454

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁰³⁷ or the previous versions⁴⁰³⁸ page to find documentation for the version you are using.

18.2.108 PictReader

This page lists supported metadata fields for the Bio-Formats PICT format reader.

These fields are from the OME data model⁴⁰³⁹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats PICT format reader:

- Channel : ID⁴⁰⁴⁰
- Channel : SamplesPerPixel⁴⁰⁴¹
- Image : AcquisitionDate⁴⁰⁴²
- Image : ID⁴⁰⁴³
- Image : Name⁴⁰⁴⁴
- Pixels : BigEndian⁴⁰⁴⁵

⁴⁰²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁰³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁰³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁰³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁰³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁰³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁰³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁰³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁰³⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰³⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰³⁹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁰⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁰⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁰⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁰⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁰⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁰⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

- Pixels : DimensionOrder⁴⁰⁴⁶
- Pixels : ID⁴⁰⁴⁷
- Pixels : Interleaved⁴⁰⁴⁸
- Pixels : SignificantBits⁴⁰⁴⁹
- Pixels : SizeC⁴⁰⁵⁰
- Pixels : SizeT⁴⁰⁵¹
- Pixels : SizeX⁴⁰⁵²
- Pixels : SizeY⁴⁰⁵³
- Pixels : SizeZ⁴⁰⁵⁴
- Pixels : Type⁴⁰⁵⁵
- Plane : TheC⁴⁰⁵⁶
- Plane : TheT⁴⁰⁵⁷
- Plane : TheZ⁴⁰⁵⁸

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)⁴⁰⁵⁹ or the [previous versions](#)⁴⁰⁶⁰ page to find documentation for the version you are using.

18.2.109 APNGReader

This page lists supported metadata fields for the Bio-Formats Animated PNG format reader.

These fields are from the [OME data model](#)⁴⁰⁶¹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Animated PNG format reader:

- Channel : ID⁴⁰⁶²

⁴⁰⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁰⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁰⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁰⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁰⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁰⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁰⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁰⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁰⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁰⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁰⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁰⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁰⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁰⁵⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰⁶⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰⁶¹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁰⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

- Channel : SamplesPerPixel⁴⁰⁶³
- Image : AcquisitionDate⁴⁰⁶⁴
- Image : ID⁴⁰⁶⁵
- Image : Name⁴⁰⁶⁶
- Pixels : BigEndian⁴⁰⁶⁷
- Pixels : DimensionOrder⁴⁰⁶⁸
- Pixels : ID⁴⁰⁶⁹
- Pixels : Interleaved⁴⁰⁷⁰
- Pixels : SignificantBits⁴⁰⁷¹
- Pixels : SizeC⁴⁰⁷²
- Pixels : SizeT⁴⁰⁷³
- Pixels : SizeX⁴⁰⁷⁴
- Pixels : SizeY⁴⁰⁷⁵
- Pixels : SizeZ⁴⁰⁷⁶
- Pixels : Type⁴⁰⁷⁷
- Plane : TheC⁴⁰⁷⁸
- Plane : TheT⁴⁰⁷⁹
- Plane : TheZ⁴⁰⁸⁰

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁰⁸¹ or the previous versions⁴⁰⁸² page to find documentation for the version you are using.

18.2.110 PrairieReader

This page lists supported metadata fields for the Bio-Formats Prairie TIFF format reader.

These fields are from the OME data model⁴⁰⁸³. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

⁴⁰⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁰⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁰⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁰⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁰⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁰⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁰⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁰⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁰⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁰⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁰⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁰⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁰⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁰⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁰⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁰⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁰⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁰⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁰⁸¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰⁸²<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰⁸³<http://www.openmicroscopy.org/site/support/ome-model/>

- The file format itself supports 46 of them (9%).
- Of those, Bio-Formats fully or partially converts 46 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Prairie TIFF format reader:

- Channel : EmissionWavelength⁴⁰⁸⁴
- Channel : ID⁴⁰⁸⁵
- Channel : Name⁴⁰⁸⁶
- Channel : SamplesPerPixel⁴⁰⁸⁷
- Detector : ID⁴⁰⁸⁸
- Detector : Type⁴⁰⁸⁹
- Detector : Zoom⁴⁰⁹⁰
- DetectorSettings : Gain⁴⁰⁹¹
- DetectorSettings : ID⁴⁰⁹²
- DetectorSettings : Offset⁴⁰⁹³
- Image : AcquisitionDate⁴⁰⁹⁴
- Image : ID⁴⁰⁹⁵
- Image : InstrumentRef⁴⁰⁹⁶
- Image : Name⁴⁰⁹⁷
- Instrument : ID⁴⁰⁹⁸
- Laser : ID⁴⁰⁹⁹
- Laser : Power⁴¹⁰⁰
- Microscope : Model⁴¹⁰¹
- Objective : Correction⁴¹⁰²
- Objective : ID⁴¹⁰³
- Objective : Immersion⁴¹⁰⁴
- Objective : LensNA⁴¹⁰⁵
- Objective : Manufacturer⁴¹⁰⁶

⁴⁰⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁴⁰⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁰⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁴⁰⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁰⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴⁰⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁴⁰⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Zoom

⁴⁰⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁴⁰⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁴⁰⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

⁴⁰⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁰⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁰⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁴⁰⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁰⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴⁰⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

⁴¹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁴¹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴¹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁴¹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴¹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁴¹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

⁴¹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

- Objective : NominalMagnification⁴¹⁰⁷
- ObjectiveSettings : ID⁴¹⁰⁸
- Pixels : BigEndian⁴¹⁰⁹
- Pixels : DimensionOrder⁴¹¹⁰
- Pixels : ID⁴¹¹¹
- Pixels : Interleaved⁴¹¹²
- Pixels : PhysicalSizeX⁴¹¹³
- Pixels : PhysicalSizeY⁴¹¹⁴
- Pixels : SignificantBits⁴¹¹⁵
- Pixels : SizeC⁴¹¹⁶
- Pixels : SizeT⁴¹¹⁷
- Pixels : SizeX⁴¹¹⁸
- Pixels : SizeY⁴¹¹⁹
- Pixels : SizeZ⁴¹²⁰
- Pixels : TimeIncrement⁴¹²¹
- Pixels : Type⁴¹²²
- Plane : DeltaT⁴¹²³
- Plane : PositionX⁴¹²⁴
- Plane : PositionY⁴¹²⁵
- Plane : PositionZ⁴¹²⁶
- Plane : TheC⁴¹²⁷
- Plane : TheT⁴¹²⁸
- Plane : TheZ⁴¹²⁹

Total supported: 46

Total unknown or missing: 429

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴¹³⁰ or the previous versions⁴¹³¹ page to find documentation for the version you are using.

⁴¹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁴¹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁴¹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴¹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴¹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴¹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴¹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴¹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴¹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴¹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴¹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴¹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴¹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴¹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴¹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

⁴¹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴¹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁴¹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

⁴¹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

⁴¹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

⁴¹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴¹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴¹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴¹³⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴¹³¹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.111 QuesantReader

This page lists supported metadata fields for the Bio-Formats Quesant AFM format reader.

These fields are from the [OME data model](#)⁴¹³². Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Quesant AFM format reader:

- Channel : ID⁴¹³³
- Channel : SamplesPerPixel⁴¹³⁴
- Image : AcquisitionDate⁴¹³⁵
- Image : Description⁴¹³⁶
- Image : ID⁴¹³⁷
- Image : Name⁴¹³⁸
- Pixels : BigEndian⁴¹³⁹
- Pixels : DimensionOrder⁴¹⁴⁰
- Pixels : ID⁴¹⁴¹
- Pixels : Interleaved⁴¹⁴²
- Pixels : PhysicalSizeX⁴¹⁴³
- Pixels : PhysicalSizeY⁴¹⁴⁴
- Pixels : SignificantBits⁴¹⁴⁵
- Pixels : SizeC⁴¹⁴⁶
- Pixels : SizeT⁴¹⁴⁷
- Pixels : SizeX⁴¹⁴⁸
- Pixels : SizeY⁴¹⁴⁹

⁴¹³²<http://www.openmicroscopy.org/site/support/ome-model/>

⁴¹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴¹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴¹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴¹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴¹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴¹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴¹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴¹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴¹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴¹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴¹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴¹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴¹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴¹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴¹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴¹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴¹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ⁴¹⁵⁰
- Pixels : Type⁴¹⁵¹
- Plane : TheC⁴¹⁵²
- Plane : TheT⁴¹⁵³
- Plane : TheZ⁴¹⁵⁴

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴¹⁵⁵](#) or the [previous versions⁴¹⁵⁶](#) page to find documentation for the version you are using.

18.2.112 NativeQTReader

This page lists supported metadata fields for the Bio-Formats QuickTime format reader.

These fields are from the [OME data model⁴¹⁵⁷](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats QuickTime format reader:

- Channel : ID⁴¹⁵⁸
- Channel : SamplesPerPixel⁴¹⁵⁹
- Image : AcquisitionDate⁴¹⁶⁰
- Image : ID⁴¹⁶¹
- Image : Name⁴¹⁶²
- Pixels : BigEndian⁴¹⁶³
- Pixels : DimensionOrder⁴¹⁶⁴
- Pixels : ID⁴¹⁶⁵
- Pixels : Interleaved⁴¹⁶⁶

⁴¹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴¹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴¹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴¹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴¹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴¹⁵⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴¹⁵⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁴¹⁵⁷<http://www.openmicroscopy.org/site/support/ome-model/>

⁴¹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴¹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴¹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴¹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴¹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴¹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴¹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴¹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴¹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

- Pixels : SignificantBits⁴¹⁶⁷
- Pixels : SizeC⁴¹⁶⁸
- Pixels : SizeT⁴¹⁶⁹
- Pixels : SizeX⁴¹⁷⁰
- Pixels : SizeY⁴¹⁷¹
- Pixels : SizeZ⁴¹⁷²
- Pixels : Type⁴¹⁷³
- Plane : TheC⁴¹⁷⁴
- Plane : TheT⁴¹⁷⁵
- Plane : TheZ⁴¹⁷⁶

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴¹⁷⁷](#) or the [previous versions⁴¹⁷⁸](#) page to find documentation for the version you are using.

18.2.113 RHKReader

This page lists supported metadata fields for the Bio-Formats RHK Technologies format reader.

These fields are from the [OME data model⁴¹⁷⁹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats RHK Technologies format reader:

- Channel : ID⁴¹⁸⁰
- Channel : SamplesPerPixel⁴¹⁸¹
- Image : AcquisitionDate⁴¹⁸²
- Image : Description⁴¹⁸³

⁴¹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴¹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴¹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴¹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴¹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴¹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴¹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴¹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴¹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴¹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴¹⁷⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴¹⁷⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴¹⁷⁹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴¹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴¹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴¹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴¹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

- Image : ID⁴¹⁸⁴
- Image : Name⁴¹⁸⁵
- Pixels : BigEndian⁴¹⁸⁶
- Pixels : DimensionOrder⁴¹⁸⁷
- Pixels : ID⁴¹⁸⁸
- Pixels : Interleaved⁴¹⁸⁹
- Pixels : PhysicalSizeX⁴¹⁹⁰
- Pixels : PhysicalSizeY⁴¹⁹¹
- Pixels : SignificantBits⁴¹⁹²
- Pixels : SizeC⁴¹⁹³
- Pixels : SizeT⁴¹⁹⁴
- Pixels : SizeX⁴¹⁹⁵
- Pixels : SizeY⁴¹⁹⁶
- Pixels : SizeZ⁴¹⁹⁷
- Pixels : Type⁴¹⁹⁸
- Plane : TheC⁴¹⁹⁹
- Plane : TheT⁴²⁰⁰
- Plane : TheZ⁴²⁰¹

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴²⁰² or the previous versions⁴²⁰³ page to find documentation for the version you are using.

18.2.114 SBIGReader

This page lists supported metadata fields for the Bio-Formats SBIG format reader.

These fields are from the OME data model⁴²⁰⁴. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- ⁴¹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ⁴¹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ⁴¹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ⁴¹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ⁴¹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁴¹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁴¹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ⁴¹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ⁴¹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁴¹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁴¹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁴¹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁴¹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁴¹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁴¹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁴¹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁴²⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁴²⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁴²⁰²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁴²⁰³<http://www.openmicroscopy.org/site/support/legacy/>
- ⁴²⁰⁴<http://www.openmicroscopy.org/site/support/ome-model/>

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats SBIG format reader:

- Channel : ID⁴²⁰⁵
- Channel : SamplesPerPixel⁴²⁰⁶
- Image : AcquisitionDate⁴²⁰⁷
- Image : Description⁴²⁰⁸
- Image : ID⁴²⁰⁹
- Image : Name⁴²¹⁰
- Pixels : BigEndian⁴²¹¹
- Pixels : DimensionOrder⁴²¹²
- Pixels : ID⁴²¹³
- Pixels : Interleaved⁴²¹⁴
- Pixels : PhysicalSizeX⁴²¹⁵
- Pixels : PhysicalSizeY⁴²¹⁶
- Pixels : SignificantBits⁴²¹⁷
- Pixels : SizeC⁴²¹⁸
- Pixels : SizeT⁴²¹⁹
- Pixels : SizeX⁴²²⁰
- Pixels : SizeY⁴²²¹
- Pixels : SizeZ⁴²²²
- Pixels : Type⁴²²³
- Plane : TheC⁴²²⁴
- Plane : TheT⁴²²⁵
- Plane : TheZ⁴²²⁶

⁴²⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴²⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴²⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴²⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴²⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴²¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴²¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴²¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴²¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴²¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴²¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴²¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴²¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴²¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴²¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴²²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴²²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴²²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴²²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴²²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴²²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴²²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴²²⁷ or the previous versions⁴²²⁸ page to find documentation for the version you are using.

18.2.115 SeikoReader

This page lists supported metadata fields for the Bio-Formats Seiko format reader.

These fields are from the OME data model⁴²²⁹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Seiko format reader:

- Channel : ID⁴²³⁰
- Channel : SamplesPerPixel⁴²³¹
- Image : AcquisitionDate⁴²³²
- Image : Description⁴²³³
- Image : ID⁴²³⁴
- Image : Name⁴²³⁵
- Pixels : BigEndian⁴²³⁶
- Pixels : DimensionOrder⁴²³⁷
- Pixels : ID⁴²³⁸
- Pixels : Interleaved⁴²³⁹
- Pixels : PhysicalSizeX⁴²⁴⁰
- Pixels : PhysicalSizeY⁴²⁴¹
- Pixels : SignificantBits⁴²⁴²
- Pixels : SizeC⁴²⁴³

⁴²²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴²²⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴²²⁹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴²³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴²³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴²³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴²³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴²³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴²³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴²³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴²³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴²³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴²³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴²⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴²⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴²⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴²⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT⁴²⁴⁴
- Pixels : SizeX⁴²⁴⁵
- Pixels : SizeY⁴²⁴⁶
- Pixels : SizeZ⁴²⁴⁷
- Pixels : Type⁴²⁴⁸
- Plane : TheC⁴²⁴⁹
- Plane : TheT⁴²⁵⁰
- Plane : TheZ⁴²⁵¹

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴²⁵² or the previous versions⁴²⁵³ page to find documentation for the version you are using.

18.2.116 PCIRReader

This page lists supported metadata fields for the Bio-Formats Compix Simple-PCI format reader.

These fields are from the OME data model⁴²⁵⁴. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 29 of them (6%).
- Of those, Bio-Formats fully or partially converts 29 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Compix Simple-PCI format reader:

- Channel : ID⁴²⁵⁵
- Channel : SamplesPerPixel⁴²⁵⁶
- Detector : ID⁴²⁵⁷
- Detector : Type⁴²⁵⁸
- DetectorSettings : Binning⁴²⁵⁹
- DetectorSettings : ID⁴²⁶⁰

⁴²⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴²⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴²⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴²⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴²⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴²⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴²⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴²⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴²⁵²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴²⁵³<http://www.openmicroscopy.org/site/support/legacy/>

⁴²⁵⁴<http://www.openmicroscopy.org/site/support/ome-model/>

⁴²⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴²⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴²⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴²⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁴²⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁴²⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

- Image : AcquisitionDate⁴²⁶¹
- Image : ID⁴²⁶²
- Image : InstrumentRef⁴²⁶³
- Image : Name⁴²⁶⁴
- Instrument : ID⁴²⁶⁵
- Pixels : BigEndian⁴²⁶⁶
- Pixels : DimensionOrder⁴²⁶⁷
- Pixels : ID⁴²⁶⁸
- Pixels : Interleaved⁴²⁶⁹
- Pixels : PhysicalSizeX⁴²⁷⁰
- Pixels : PhysicalSizeY⁴²⁷¹
- Pixels : SignificantBits⁴²⁷²
- Pixels : SizeC⁴²⁷³
- Pixels : SizeT⁴²⁷⁴
- Pixels : SizeX⁴²⁷⁵
- Pixels : SizeY⁴²⁷⁶
- Pixels : SizeZ⁴²⁷⁷
- Pixels : TimeIncrement⁴²⁷⁸
- Pixels : Type⁴²⁷⁹
- Plane : DeltaT⁴²⁸⁰
- Plane : TheC⁴²⁸¹
- Plane : TheT⁴²⁸²
- Plane : TheZ⁴²⁸³

Total supported: 29

Total unknown or missing: 446

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴²⁸⁴ or the previous versions⁴²⁸⁵ page to find documentation for the version you are using.

⁴²⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴²⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴²⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁴²⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴²⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴²⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴²⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴²⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴²⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴²⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴²⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴²⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴²⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴²⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴²⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴²⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴²⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴²⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

⁴²⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴²⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁴²⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴²⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴²⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴²⁸⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴²⁸⁵<http://www.openmicroscopy.org/site/support/legacy/>

18.2.117 SimplePCITiffReader

This page lists supported metadata fields for the Bio-Formats SimplePCI TIFF format reader.

These fields are from the [OME data model](#)⁴²⁸⁶. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 33 of them (6%).
- Of those, Bio-Formats fully or partially converts 33 (100%).

Supported fields

These fields are fully supported by the Bio-Formats SimplePCI TIFF format reader:

- Channel : ID⁴²⁸⁷
- Channel : SamplesPerPixel⁴²⁸⁸
- Detector : ID⁴²⁸⁹
- Detector : Model⁴²⁹⁰
- Detector : Type⁴²⁹¹
- DetectorSettings : Binning⁴²⁹²
- DetectorSettings : ID⁴²⁹³
- Image : AcquisitionDate⁴²⁹⁴
- Image : Description⁴²⁹⁵
- Image : ID⁴²⁹⁶
- Image : InstrumentRef⁴²⁹⁷
- Image : Name⁴²⁹⁸
- Instrument : ID⁴²⁹⁹
- Objective : ID⁴³⁰⁰
- Objective : Immersion⁴³⁰¹
- Objective : NominalMagnification⁴³⁰²
- Pixels : BigEndian⁴³⁰³

⁴²⁸⁶<http://www.openmicroscopy.org/site/support/ome-model/>

⁴²⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴²⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴²⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴²⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴²⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁴²⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁴²⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁴²⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴²⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴²⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴²⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁴²⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴²⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴³⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴³⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁴³⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁴³⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

- Pixels : DimensionOrder⁴³⁰⁴
- Pixels : ID⁴³⁰⁵
- Pixels : Interleaved⁴³⁰⁶
- Pixels : PhysicalSizeX⁴³⁰⁷
- Pixels : PhysicalSizeY⁴³⁰⁸
- Pixels : SignificantBits⁴³⁰⁹
- Pixels : SizeC⁴³¹⁰
- Pixels : SizeT⁴³¹¹
- Pixels : SizeX⁴³¹²
- Pixels : SizeY⁴³¹³
- Pixels : SizeZ⁴³¹⁴
- Pixels : Type⁴³¹⁵
- Plane : ExposureTime⁴³¹⁶
- Plane : TheC⁴³¹⁷
- Plane : TheT⁴³¹⁸
- Plane : TheZ⁴³¹⁹

Total supported: 33

Total unknown or missing: 442

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴³²⁰ or the previous versions⁴³²¹ page to find documentation for the version you are using.

18.2.118 SMCameraReader

This page lists supported metadata fields for the Bio-Formats SM Camera format reader.

These fields are from the OME data model⁴³²². Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

⁴³⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴³⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴³⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴³⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴³⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴³⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴³¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴³¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴³¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴³¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴³¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴³¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴³¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

⁴³¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴³¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴³¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴³²⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³²¹<http://www.openmicroscopy.org/site/support/legacy/>

⁴³²²<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats SM Camera format reader:

- Channel : ID⁴³²³
- Channel : SamplesPerPixel⁴³²⁴
- Image : AcquisitionDate⁴³²⁵
- Image : ID⁴³²⁶
- Image : Name⁴³²⁷
- Pixels : BigEndian⁴³²⁸
- Pixels : DimensionOrder⁴³²⁹
- Pixels : ID⁴³³⁰
- Pixels : Interleaved⁴³³¹
- Pixels : SignificantBits⁴³³²
- Pixels : SizeC⁴³³³
- Pixels : SizeT⁴³³⁴
- Pixels : SizeX⁴³³⁵
- Pixels : SizeY⁴³³⁶
- Pixels : SizeZ⁴³³⁷
- Pixels : Type⁴³³⁸
- Plane : TheC⁴³³⁹
- Plane : TheT⁴³⁴⁰
- Plane : TheZ⁴³⁴¹

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴³⁴² or the previous versions⁴³⁴³ page to find documentation for the version you are using.

⁴³²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴³²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴³²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴³²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴³²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴³²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴³²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴³³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴³³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴³³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴³³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴³³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴³³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴³³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴³³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴³³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴³³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴³⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴³⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴³⁴²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³⁴³<http://www.openmicroscopy.org/site/support/legacy/>

18.2.119 SpiderReader

This page lists supported metadata fields for the Bio-Formats SPIDER format reader.

These fields are from the [OME data model](#)⁴³⁴⁴. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 21 of them (4%).
- Of those, Bio-Formats fully or partially converts 21 (100%).

Supported fields

These fields are fully supported by the Bio-Formats SPIDER format reader:

- Channel : ID⁴³⁴⁵
- Channel : SamplesPerPixel⁴³⁴⁶
- Image : AcquisitionDate⁴³⁴⁷
- Image : ID⁴³⁴⁸
- Image : Name⁴³⁴⁹
- Pixels : BigEndian⁴³⁵⁰
- Pixels : DimensionOrder⁴³⁵¹
- Pixels : ID⁴³⁵²
- Pixels : Interleaved⁴³⁵³
- Pixels : PhysicalSizeX⁴³⁵⁴
- Pixels : PhysicalSizeY⁴³⁵⁵
- Pixels : SignificantBits⁴³⁵⁶
- Pixels : SizeC⁴³⁵⁷
- Pixels : SizeT⁴³⁵⁸
- Pixels : SizeX⁴³⁵⁹
- Pixels : SizeY⁴³⁶⁰
- Pixels : SizeZ⁴³⁶¹
- Pixels : Type⁴³⁶²

⁴³⁴⁴<http://www.openmicroscopy.org/site/support/ome-model/>

⁴³⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴³⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴³⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴³⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴³⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴³⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴³⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴³⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴³⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴³⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴³⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴³⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴³⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴³⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴³⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴³⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴³⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴³⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC⁴³⁶³
- Plane : TheT⁴³⁶⁴
- Plane : TheZ⁴³⁶⁵

Total supported: 21

Total unknown or missing: 454

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴³⁶⁶](#) or the [previous versions⁴³⁶⁷](#) page to find documentation for the version you are using.

18.2.120 TargaReader

This page lists supported metadata fields for the Bio-Formats Truevision Targa format reader.

These fields are from the [OME data model⁴³⁶⁸](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 20 of them (4%).
- Of those, Bio-Formats fully or partially converts 20 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Truevision Targa format reader:

- Channel : ID⁴³⁶⁹
- Channel : SamplesPerPixel⁴³⁷⁰
- Image : AcquisitionDate⁴³⁷¹
- Image : Description⁴³⁷²
- Image : ID⁴³⁷³
- Image : Name⁴³⁷⁴
- Pixels : BigEndian⁴³⁷⁵
- Pixels : DimensionOrder⁴³⁷⁶
- Pixels : ID⁴³⁷⁷
- Pixels : Interleaved⁴³⁷⁸
- Pixels : SignificantBits⁴³⁷⁹

⁴³⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴³⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴³⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴³⁶⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³⁶⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴³⁶⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁴³⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴³⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴³⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴³⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴³⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴³⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴³⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴³⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴³⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴³⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴³⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

- Pixels : SizeC⁴³⁸⁰
- Pixels : SizeT⁴³⁸¹
- Pixels : SizeX⁴³⁸²
- Pixels : SizeY⁴³⁸³
- Pixels : SizeZ⁴³⁸⁴
- Pixels : Type⁴³⁸⁵
- Plane : TheC⁴³⁸⁶
- Plane : TheT⁴³⁸⁷
- Plane : TheZ⁴³⁸⁸

Total supported: 20

Total unknown or missing: 455

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴³⁸⁹](#) or the [previous versions⁴³⁹⁰](#) page to find documentation for the version you are using.

18.2.121 TextReader

This page lists supported metadata fields for the Bio-Formats Text format reader.

These fields are from the [OME data model⁴³⁹¹](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Text format reader:

- Channel : ID⁴³⁹²
- Channel : SamplesPerPixel⁴³⁹³
- Image : AcquisitionDate⁴³⁹⁴
- Image : ID⁴³⁹⁵
- Image : Name⁴³⁹⁶

⁴³⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴³⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴³⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴³⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴³⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴³⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴³⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴³⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴³⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴³⁸⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³⁹⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁴³⁹¹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴³⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴³⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴³⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴³⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴³⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

- Pixels : BigEndian⁴³⁹⁷
- Pixels : DimensionOrder⁴³⁹⁸
- Pixels : ID⁴³⁹⁹
- Pixels : Interleaved⁴⁴⁰⁰
- Pixels : SignificantBits⁴⁴⁰¹
- Pixels : SizeC⁴⁴⁰²
- Pixels : SizeT⁴⁴⁰³
- Pixels : SizeX⁴⁴⁰⁴
- Pixels : SizeY⁴⁴⁰⁵
- Pixels : SizeZ⁴⁴⁰⁶
- Pixels : Type⁴⁴⁰⁷
- Plane : TheC⁴⁴⁰⁸
- Plane : TheT⁴⁴⁰⁹
- Plane : TheZ⁴⁴¹⁰

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁴¹¹ or the previous versions⁴⁴¹² page to find documentation for the version you are using.

18.2.122 TiffReader

This page lists supported metadata fields for the Bio-Formats Tagged Image File Format format reader.

These fields are from the OME data model⁴⁴¹³. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Tagged Image File Format format reader:

- ⁴³⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ⁴³⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ⁴³⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁴⁴⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁴⁴⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁴⁴⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁴⁴⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁴⁴⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁴⁴⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁴⁴⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁴⁴⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁴⁴⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁴⁴⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁴⁴¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁴⁴¹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁴⁴¹²<http://www.openmicroscopy.org/site/support/legacy/>
- ⁴⁴¹³<http://www.openmicroscopy.org/site/support/ome-model/>

- Channel : ID⁴⁴¹⁴
- Channel : SamplesPerPixel⁴⁴¹⁵
- Image : AcquisitionDate⁴⁴¹⁶
- Image : Description⁴⁴¹⁷
- Image : ID⁴⁴¹⁸
- Image : Name⁴⁴¹⁹
- Pixels : BigEndian⁴⁴²⁰
- Pixels : DimensionOrder⁴⁴²¹
- Pixels : ID⁴⁴²²
- Pixels : Interleaved⁴⁴²³
- Pixels : PhysicalSizeZ⁴⁴²⁴
- Pixels : SignificantBits⁴⁴²⁵
- Pixels : SizeC⁴⁴²⁶
- Pixels : SizeT⁴⁴²⁷
- Pixels : SizeX⁴⁴²⁸
- Pixels : SizeY⁴⁴²⁹
- Pixels : SizeZ⁴⁴³⁰
- Pixels : TimeIncrement⁴⁴³¹
- Pixels : Type⁴⁴³²
- Plane : TheC⁴⁴³³
- Plane : TheT⁴⁴³⁴
- Plane : TheZ⁴⁴³⁵

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁴³⁶ or the previous versions⁴⁴³⁷ page to find documentation for the version you are using.

⁴⁴¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁴¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁴¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁴¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁴¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁴¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁴²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁴²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁴²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁴²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁴²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁴⁴²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁴²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁴²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁴²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁴²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁴³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁴³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

⁴⁴³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁴³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁴³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁴³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁴³⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴³⁷<http://www.openmicroscopy.org/site/support/legacy/>

18.2.123 TillVisionReader

This page lists supported metadata fields for the Bio-Formats TillVision format reader.

These fields are from the [OME data model](#)⁴⁴³⁸. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats TillVision format reader:

- Channel : ID⁴⁴³⁹
- Channel : SamplesPerPixel⁴⁴⁴⁰
- Experiment : ID⁴⁴⁴¹
- Experiment : Type⁴⁴⁴²
- Image : AcquisitionDate⁴⁴⁴³
- Image : ID⁴⁴⁴⁴
- Image : Name⁴⁴⁴⁵
- Pixels : BigEndian⁴⁴⁴⁶
- Pixels : DimensionOrder⁴⁴⁴⁷
- Pixels : ID⁴⁴⁴⁸
- Pixels : Interleaved⁴⁴⁴⁹
- Pixels : SignificantBits⁴⁴⁵⁰
- Pixels : SizeC⁴⁴⁵¹
- Pixels : SizeT⁴⁴⁵²
- Pixels : SizeX⁴⁴⁵³
- Pixels : SizeY⁴⁴⁵⁴
- Pixels : SizeZ⁴⁴⁵⁵
- Pixels : Type⁴⁴⁵⁶
- Plane : ExposureTime⁴⁴⁵⁷

⁴⁴³⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁴³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁴⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁴⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID

⁴⁴⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type

⁴⁴⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁴⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁴⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁴⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁴⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁴⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁴⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁴⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁴⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁴⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁴⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁴⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁴⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁴⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁴⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

- Plane : TheC⁴⁴⁵⁸
- Plane : TheT⁴⁴⁵⁹
- Plane : TheZ⁴⁴⁶⁰

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴⁴⁶¹](#) or the [previous versions⁴⁴⁶²](#) page to find documentation for the version you are using.

18.2.124 TopometrixReader

This page lists supported metadata fields for the Bio-Formats TopoMetrix format reader.

These fields are from the [OME data model⁴⁴⁶³](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats TopoMetrix format reader:

- Channel : ID⁴⁴⁶⁴
- Channel : SamplesPerPixel⁴⁴⁶⁵
- Image : AcquisitionDate⁴⁴⁶⁶
- Image : Description⁴⁴⁶⁷
- Image : ID⁴⁴⁶⁸
- Image : Name⁴⁴⁶⁹
- Pixels : BigEndian⁴⁴⁷⁰
- Pixels : DimensionOrder⁴⁴⁷¹
- Pixels : ID⁴⁴⁷²
- Pixels : Interleaved⁴⁴⁷³
- Pixels : PhysicalSizeX⁴⁴⁷⁴

⁴⁴⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁴⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁴⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁴⁶¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴⁶²<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁴⁶³<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁴⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁴⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁴⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁴⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁴⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁴⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁴⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁴⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁴⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁴⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁴⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

- Pixels : PhysicalSizeY⁴⁴⁷⁵
- Pixels : SignificantBits⁴⁴⁷⁶
- Pixels : SizeC⁴⁴⁷⁷
- Pixels : SizeT⁴⁴⁷⁸
- Pixels : SizeX⁴⁴⁷⁹
- Pixels : SizeY⁴⁴⁸⁰
- Pixels : SizeZ⁴⁴⁸¹
- Pixels : Type⁴⁴⁸²
- Plane : TheC⁴⁴⁸³
- Plane : TheT⁴⁴⁸⁴
- Plane : TheZ⁴⁴⁸⁵

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version⁴⁴⁸⁶](#) or the [previous versions⁴⁴⁸⁷](#) page to find documentation for the version you are using.

18.2.125 TrestleReader

This page lists supported metadata fields for the Bio-Formats Trestle format reader.

These fields are from the [OME data model⁴⁴⁸⁸](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 26 of them (5%).
- Of those, Bio-Formats fully or partially converts 26 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Trestle format reader:

- Channel : ID⁴⁴⁸⁹
- Channel : SamplesPerPixel⁴⁴⁹⁰
- Image : AcquisitionDate⁴⁴⁹¹

⁴⁴⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁴⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁴⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁴⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁴⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁴⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁴⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁴⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁴⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁴⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁴⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁴⁸⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴⁸⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁴⁸⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁴⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁴⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁴⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID⁴⁴⁹²
- Image : Name⁴⁴⁹³
- Image : ROIRef⁴⁴⁹⁴
- Mask : Height⁴⁴⁹⁵
- Mask : ID⁴⁴⁹⁶
- Mask : Width⁴⁴⁹⁷
- Mask : X⁴⁴⁹⁸
- Mask : Y⁴⁴⁹⁹
- Pixels : BigEndian⁴⁵⁰⁰
- Pixels : DimensionOrder⁴⁵⁰¹
- Pixels : ID⁴⁵⁰²
- Pixels : Interleaved⁴⁵⁰³
- Pixels : SignificantBits⁴⁵⁰⁴
- Pixels : SizeC⁴⁵⁰⁵
- Pixels : SizeT⁴⁵⁰⁶
- Pixels : SizeX⁴⁵⁰⁷
- Pixels : SizeY⁴⁵⁰⁸
- Pixels : SizeZ⁴⁵⁰⁹
- Pixels : Type⁴⁵¹⁰
- Plane : TheC⁴⁵¹¹
- Plane : TheT⁴⁵¹²
- Plane : TheZ⁴⁵¹³
- ROI : ID⁴⁵¹⁴

Total supported: 26

Total unknown or missing: 449

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁵¹⁵ or the previous versions⁴⁵¹⁶ page to find documentation for the version you are using.

⁴⁴⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁴⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁴⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

⁴⁴⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Height

⁴⁴⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁴⁴⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Width

⁴⁴⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_X

⁴⁴⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Y

⁴⁵⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁵⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁵⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁵⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁵⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁵⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁵⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁵⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁵⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁵⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁵¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁵¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁵¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁵¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁵¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

⁴⁵¹⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁵¹⁶<http://www.openmicroscopy.org/site/support/legacy/>

18.2.126 UBMReader

This page lists supported metadata fields for the Bio-Formats UBM format reader.

These fields are from the [OME data model](#)⁴⁵¹⁷. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats UBM format reader:

- Channel : ID⁴⁵¹⁸
- Channel : SamplesPerPixel⁴⁵¹⁹
- Image : AcquisitionDate⁴⁵²⁰
- Image : ID⁴⁵²¹
- Image : Name⁴⁵²²
- Pixels : BigEndian⁴⁵²³
- Pixels : DimensionOrder⁴⁵²⁴
- Pixels : ID⁴⁵²⁵
- Pixels : Interleaved⁴⁵²⁶
- Pixels : SignificantBits⁴⁵²⁷
- Pixels : SizeC⁴⁵²⁸
- Pixels : SizeT⁴⁵²⁹
- Pixels : SizeX⁴⁵³⁰
- Pixels : SizeY⁴⁵³¹
- Pixels : SizeZ⁴⁵³²
- Pixels : Type⁴⁵³³
- Plane : TheC⁴⁵³⁴

⁴⁵¹⁷<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁵¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁵¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁵²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁵²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁵²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁵²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁵²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁵²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁵²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁵²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁵²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁵²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁵³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁵³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁵³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁵³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁵³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

- Plane : TheT⁴⁵³⁵
- Plane : TheZ⁴⁵³⁶

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁵³⁷ or the previous versions⁴⁵³⁸ page to find documentation for the version you are using.

18.2.127 UnisokuReader

This page lists supported metadata fields for the Bio-Formats Unisoku STM format reader.

These fields are from the OME data model⁴⁵³⁹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Unisoku STM format reader:

- Channel : ID⁴⁵⁴⁰
- Channel : SamplesPerPixel⁴⁵⁴¹
- Image : AcquisitionDate⁴⁵⁴²
- Image : Description⁴⁵⁴³
- Image : ID⁴⁵⁴⁴
- Image : Name⁴⁵⁴⁵
- Pixels : BigEndian⁴⁵⁴⁶
- Pixels : DimensionOrder⁴⁵⁴⁷
- Pixels : ID⁴⁵⁴⁸
- Pixels : Interleaved⁴⁵⁴⁹
- Pixels : PhysicalSizeX⁴⁵⁵⁰
- Pixels : PhysicalSizeY⁴⁵⁵¹

⁴⁵³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁵³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁵³⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁵³⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁵³⁹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁵⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁵⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁵⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁵⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁵⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁵⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁵⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁵⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁵⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁵⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁵⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁵⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

- Pixels : SignificantBits⁴⁵⁵²
- Pixels : SizeC⁴⁵⁵³
- Pixels : SizeT⁴⁵⁵⁴
- Pixels : SizeX⁴⁵⁵⁵
- Pixels : SizeY⁴⁵⁵⁶
- Pixels : SizeZ⁴⁵⁵⁷
- Pixels : Type⁴⁵⁵⁸
- Plane : TheC⁴⁵⁵⁹
- Plane : TheT⁴⁵⁶⁰
- Plane : TheZ⁴⁵⁶¹

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴⁵⁶²](#) or the [previous versions⁴⁵⁶³](#) page to find documentation for the version you are using.

18.2.128 VarianFDFReader

This page lists supported metadata fields for the Bio-Formats Varian FDF format reader.

These fields are from the [OME data model⁴⁵⁶⁴](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 25 of them (5%).
- Of those, Bio-Formats fully or partially converts 25 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Varian FDF format reader:

- Channel : ID⁴⁵⁶⁵
- Channel : SamplesPerPixel⁴⁵⁶⁶
- Image : AcquisitionDate⁴⁵⁶⁷
- Image : ID⁴⁵⁶⁸

⁴⁵⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁵⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁵⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁵⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁵⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁵⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁵⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁵⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁵⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁵⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁵⁶²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁵⁶³<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁵⁶⁴<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁵⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁵⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁵⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁵⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name⁴⁵⁶⁹
- Pixels : BigEndian⁴⁵⁷⁰
- Pixels : DimensionOrder⁴⁵⁷¹
- Pixels : ID⁴⁵⁷²
- Pixels : Interleaved⁴⁵⁷³
- Pixels : PhysicalSizeX⁴⁵⁷⁴
- Pixels : PhysicalSizeY⁴⁵⁷⁵
- Pixels : PhysicalSizeZ⁴⁵⁷⁶
- Pixels : SignificantBits⁴⁵⁷⁷
- Pixels : SizeC⁴⁵⁷⁸
- Pixels : SizeT⁴⁵⁷⁹
- Pixels : SizeX⁴⁵⁸⁰
- Pixels : SizeY⁴⁵⁸¹
- Pixels : SizeZ⁴⁵⁸²
- Pixels : Type⁴⁵⁸³
- Plane : PositionX⁴⁵⁸⁴
- Plane : PositionY⁴⁵⁸⁵
- Plane : PositionZ⁴⁵⁸⁶
- Plane : TheC⁴⁵⁸⁷
- Plane : TheT⁴⁵⁸⁸
- Plane : TheZ⁴⁵⁸⁹

Total supported: 25

Total unknown or missing: 450

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁵⁹⁰ or the previous versions⁴⁵⁹¹ page to find documentation for the version you are using.

⁴⁵⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁵⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁵⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁵⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁵⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁵⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁵⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁵⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁴⁵⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁵⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁵⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁵⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁵⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁵⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁵⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁵⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

⁴⁵⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

⁴⁵⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

⁴⁵⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁵⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁵⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁵⁹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁵⁹¹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.129 VeecoReader

This page lists supported metadata fields for the Bio-Formats Veeco format reader.

These fields are from the [OME data model](#)⁴⁵⁹². Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Veeco format reader:

- Channel : ID⁴⁵⁹³
- Channel : SamplesPerPixel⁴⁵⁹⁴
- Image : AcquisitionDate⁴⁵⁹⁵
- Image : ID⁴⁵⁹⁶
- Image : Name⁴⁵⁹⁷
- Pixels : BigEndian⁴⁵⁹⁸
- Pixels : DimensionOrder⁴⁵⁹⁹
- Pixels : ID⁴⁶⁰⁰
- Pixels : Interleaved⁴⁶⁰¹
- Pixels : SignificantBits⁴⁶⁰²
- Pixels : SizeC⁴⁶⁰³
- Pixels : SizeT⁴⁶⁰⁴
- Pixels : SizeX⁴⁶⁰⁵
- Pixels : SizeY⁴⁶⁰⁶
- Pixels : SizeZ⁴⁶⁰⁷
- Pixels : Type⁴⁶⁰⁸
- Plane : TheC⁴⁶⁰⁹
- Plane : TheT⁴⁶¹⁰

⁴⁵⁹²<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁵⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁵⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁵⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁵⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁵⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁵⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁵⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁶⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁶⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁶⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁶⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁶⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁶⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁶⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁶⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁶⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁶⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁶¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ⁴⁶¹¹

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁶¹² or the previous versions⁴⁶¹³ page to find documentation for the version you are using.

18.2.130 VGSAMReader

This page lists supported metadata fields for the Bio-Formats VG SAM format reader.

These fields are from the OME data model⁴⁶¹⁴. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats VG SAM format reader:

- Channel : ID⁴⁶¹⁵
- Channel : SamplesPerPixel⁴⁶¹⁶
- Image : AcquisitionDate⁴⁶¹⁷
- Image : ID⁴⁶¹⁸
- Image : Name⁴⁶¹⁹
- Pixels : BigEndian⁴⁶²⁰
- Pixels : DimensionOrder⁴⁶²¹
- Pixels : ID⁴⁶²²
- Pixels : Interleaved⁴⁶²³
- Pixels : SignificantBits⁴⁶²⁴
- Pixels : SizeC⁴⁶²⁵
- Pixels : SizeT⁴⁶²⁶
- Pixels : SizeX⁴⁶²⁷

⁴⁶¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁶¹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁶¹³<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁶¹⁴<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁶¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁶¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁶¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁶¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁶¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁶²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁶²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁶²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁶²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁶²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁶²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁶²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁶²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

- Pixels : SizeY⁴⁶²⁸
- Pixels : SizeZ⁴⁶²⁹
- Pixels : Type⁴⁶³⁰
- Plane : TheC⁴⁶³¹
- Plane : TheT⁴⁶³²
- Plane : TheZ⁴⁶³³

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁶³⁴ or the previous versions⁴⁶³⁵ page to find documentation for the version you are using.

18.2.131 VisitechReader

This page lists supported metadata fields for the Bio-Formats Visitech XYs format reader.

These fields are from the OME data model⁴⁶³⁶. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Visitech XYs format reader:

- Channel : ID⁴⁶³⁷
- Channel : SamplesPerPixel⁴⁶³⁸
- Image : AcquisitionDate⁴⁶³⁹
- Image : ID⁴⁶⁴⁰
- Image : Name⁴⁶⁴¹
- Pixels : BigEndian⁴⁶⁴²
- Pixels : DimensionOrder⁴⁶⁴³
- Pixels : ID⁴⁶⁴⁴

⁴⁶²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁶²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁶³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁶³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁶³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁶³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁶³⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁶³⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁶³⁶<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁶³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁶³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁶³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁶⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁶⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁶⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁶⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁶⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

- Pixels : Interleaved⁴⁶⁴⁵
- Pixels : SignificantBits⁴⁶⁴⁶
- Pixels : SizeC⁴⁶⁴⁷
- Pixels : SizeT⁴⁶⁴⁸
- Pixels : SizeX⁴⁶⁴⁹
- Pixels : SizeY⁴⁶⁵⁰
- Pixels : SizeZ⁴⁶⁵¹
- Pixels : Type⁴⁶⁵²
- Plane : TheC⁴⁶⁵³
- Plane : TheT⁴⁶⁵⁴
- Plane : TheZ⁴⁶⁵⁵

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴⁶⁵⁶](#) or the [previous versions⁴⁶⁵⁷](#) page to find documentation for the version you are using.

18.2.132 VolocityClippingReader

This page lists supported metadata fields for the Bio-Formats Volocity Library Clipping format reader.

These fields are from the [OME data model⁴⁶⁵⁸](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Volocity Library Clipping format reader:

- Channel : ID⁴⁶⁵⁹
- Channel : SamplesPerPixel⁴⁶⁶⁰
- Image : AcquisitionDate⁴⁶⁶¹

⁴⁶⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁶⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁶⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁶⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁶⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁶⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁶⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁶⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁶⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁶⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁶⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁶⁵⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁶⁵⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁶⁵⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁶⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁶⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁶⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID⁴⁶⁶²
- Image : Name⁴⁶⁶³
- Pixels : BigEndian⁴⁶⁶⁴
- Pixels : DimensionOrder⁴⁶⁶⁵
- Pixels : ID⁴⁶⁶⁶
- Pixels : Interleaved⁴⁶⁶⁷
- Pixels : SignificantBits⁴⁶⁶⁸
- Pixels : SizeC⁴⁶⁶⁹
- Pixels : SizeT⁴⁶⁷⁰
- Pixels : SizeX⁴⁶⁷¹
- Pixels : SizeY⁴⁶⁷²
- Pixels : SizeZ⁴⁶⁷³
- Pixels : Type⁴⁶⁷⁴
- Plane : TheC⁴⁶⁷⁵
- Plane : TheT⁴⁶⁷⁶
- Plane : TheZ⁴⁶⁷⁷

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁶⁷⁸ or the previous versions⁴⁶⁷⁹ page to find documentation for the version you are using.

18.2.133 VolocityReader

This page lists supported metadata fields for the Bio-Formats Volocity Library format reader.

These fields are from the OME data model⁴⁶⁸⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 38 of them (8%).
- Of those, Bio-Formats fully or partially converts 38 (100%).

⁴⁶⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁶⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁶⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁶⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁶⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁶⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁶⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁶⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁶⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁶⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁶⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁶⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁶⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁶⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁶⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁶⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁶⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁶⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁶⁸⁰<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Volocity Library format reader:

- Channel : ID⁴⁶⁸¹
- Channel : Name⁴⁶⁸²
- Channel : SamplesPerPixel⁴⁶⁸³
- Detector : ID⁴⁶⁸⁴
- Detector : Model⁴⁶⁸⁵
- DetectorSettings : ID⁴⁶⁸⁶
- Image : AcquisitionDate⁴⁶⁸⁷
- Image : Description⁴⁶⁸⁸
- Image : ID⁴⁶⁸⁹
- Image : InstrumentRef⁴⁶⁹⁰
- Image : Name⁴⁶⁹¹
- Instrument : ID⁴⁶⁹²
- Objective : Correction⁴⁶⁹³
- Objective : ID⁴⁶⁹⁴
- Objective : Immersion⁴⁶⁹⁵
- Objective : NominalMagnification⁴⁶⁹⁶
- ObjectiveSettings : ID⁴⁶⁹⁷
- Pixels : BigEndian⁴⁶⁹⁸
- Pixels : DimensionOrder⁴⁶⁹⁹
- Pixels : ID⁴⁷⁰⁰
- Pixels : Interleaved⁴⁷⁰¹
- Pixels : PhysicalSizeX⁴⁷⁰²
- Pixels : PhysicalSizeY⁴⁷⁰³
- Pixels : PhysicalSizeZ⁴⁷⁰⁴

⁴⁶⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁶⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁴⁶⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁶⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴⁶⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁶⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁴⁶⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁶⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁶⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁶⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁴⁶⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁶⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴⁶⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁴⁶⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴⁶⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁴⁶⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁴⁶⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁴⁶⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁶⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁷⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁷⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁷⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁷⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁷⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

- Pixels : SignificantBits⁴⁷⁰⁵
- Pixels : SizeC⁴⁷⁰⁶
- Pixels : SizeT⁴⁷⁰⁷
- Pixels : SizeX⁴⁷⁰⁸
- Pixels : SizeY⁴⁷⁰⁹
- Pixels : SizeZ⁴⁷¹⁰
- Pixels : Type⁴⁷¹¹
- Plane : DeltaT⁴⁷¹²
- Plane : PositionX⁴⁷¹³
- Plane : PositionY⁴⁷¹⁴
- Plane : PositionZ⁴⁷¹⁵
- Plane : TheC⁴⁷¹⁶
- Plane : TheT⁴⁷¹⁷
- Plane : TheZ⁴⁷¹⁸

Total supported: 38

Total unknown or missing: 437

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁷¹⁹ or the previous versions⁴⁷²⁰ page to find documentation for the version you are using.

18.2.134 WATOPReader

This page lists supported metadata fields for the Bio-Formats WA Technology TOP format reader.

These fields are from the OME data model⁴⁷²¹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 22 of them (4%).
- Of those, Bio-Formats fully or partially converts 22 (100%).

Supported fields

These fields are fully supported by the Bio-Formats WA Technology TOP format reader:

- ⁴⁷⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁴⁷⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁴⁷⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁴⁷⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁴⁷⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁴⁷¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁴⁷¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁴⁷¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT
- ⁴⁷¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX
- ⁴⁷¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY
- ⁴⁷¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ
- ⁴⁷¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁴⁷¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁴⁷¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁴⁷¹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁴⁷²⁰<http://www.openmicroscopy.org/site/support/legacy/>
- ⁴⁷²¹<http://www.openmicroscopy.org/site/support/ome-model/>

- Channel : ID⁴⁷²²
- Channel : SamplesPerPixel⁴⁷²³
- Image : AcquisitionDate⁴⁷²⁴
- Image : Description⁴⁷²⁵
- Image : ID⁴⁷²⁶
- Image : Name⁴⁷²⁷
- Pixels : BigEndian⁴⁷²⁸
- Pixels : DimensionOrder⁴⁷²⁹
- Pixels : ID⁴⁷³⁰
- Pixels : Interleaved⁴⁷³¹
- Pixels : PhysicalSizeX⁴⁷³²
- Pixels : PhysicalSizeY⁴⁷³³
- Pixels : SignificantBits⁴⁷³⁴
- Pixels : SizeC⁴⁷³⁵
- Pixels : SizeT⁴⁷³⁶
- Pixels : SizeX⁴⁷³⁷
- Pixels : SizeY⁴⁷³⁸
- Pixels : SizeZ⁴⁷³⁹
- Pixels : Type⁴⁷⁴⁰
- Plane : TheC⁴⁷⁴¹
- Plane : TheT⁴⁷⁴²
- Plane : TheZ⁴⁷⁴³

Total supported: 22

Total unknown or missing: 453

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁷⁴⁴ or the previous versions⁴⁷⁴⁵ page to find documentation for the version you are using.

⁴⁷²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁷²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁷²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁷²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁷²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁷²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁷²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁷²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁷³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁷³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁷³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁷³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁷³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁷³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁷³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁷³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁷³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁷³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁷⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁷⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁷⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁷⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁷⁴⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷⁴⁵<http://www.openmicroscopy.org/site/support/legacy/>

18.2.135 BMPReader

This page lists supported metadata fields for the Bio-Formats Windows Bitmap format reader.

These fields are from the [OME data model](#)⁴⁷⁴⁶. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 21 of them (4%).
- Of those, Bio-Formats fully or partially converts 21 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Windows Bitmap format reader:

- Channel : ID⁴⁷⁴⁷
- Channel : SamplesPerPixel⁴⁷⁴⁸
- Image : AcquisitionDate⁴⁷⁴⁹
- Image : ID⁴⁷⁵⁰
- Image : Name⁴⁷⁵¹
- Pixels : BigEndian⁴⁷⁵²
- Pixels : DimensionOrder⁴⁷⁵³
- Pixels : ID⁴⁷⁵⁴
- Pixels : Interleaved⁴⁷⁵⁵
- Pixels : PhysicalSizeX⁴⁷⁵⁶
- Pixels : PhysicalSizeY⁴⁷⁵⁷
- Pixels : SignificantBits⁴⁷⁵⁸
- Pixels : SizeC⁴⁷⁵⁹
- Pixels : SizeT⁴⁷⁶⁰
- Pixels : SizeX⁴⁷⁶¹
- Pixels : SizeY⁴⁷⁶²
- Pixels : SizeZ⁴⁷⁶³
- Pixels : Type⁴⁷⁶⁴

⁴⁷⁴⁶<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁷⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁷⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁷⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁷⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁷⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁷⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁷⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁷⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁷⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁷⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁷⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁷⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁷⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁷⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁷⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁷⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁷⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁷⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC⁴⁷⁶⁵
- Plane : TheT⁴⁷⁶⁶
- Plane : TheZ⁴⁷⁶⁷

Total supported: 21

Total unknown or missing: 454

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴⁷⁶⁸](#) or the [previous versions⁴⁷⁶⁹](#) page to find documentation for the version you are using.

18.2.136 WlzReader

This page lists supported metadata fields for the Bio-Formats Woolz format reader.

These fields are from the [OME data model⁴⁷⁷⁰](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 26 of them (5%).
- Of those, Bio-Formats fully or partially converts 26 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Woolz format reader:

- Channel : ID⁴⁷⁷¹
- Channel : SamplesPerPixel⁴⁷⁷²
- Image : AcquisitionDate⁴⁷⁷³
- Image : ID⁴⁷⁷⁴
- Image : Name⁴⁷⁷⁵
- Pixels : BigEndian⁴⁷⁷⁶
- Pixels : DimensionOrder⁴⁷⁷⁷
- Pixels : ID⁴⁷⁷⁸
- Pixels : Interleaved⁴⁷⁷⁹
- Pixels : PhysicalSizeX⁴⁷⁸⁰
- Pixels : PhysicalSizeY⁴⁷⁸¹

⁴⁷⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁷⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁷⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁷⁶⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷⁶⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁷⁷⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁷⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁷⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁷⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁷⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁷⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁷⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁷⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁷⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁷⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁷⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁷⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

- Pixels : PhysicalSizeZ⁴⁷⁸²
- Pixels : SignificantBits⁴⁷⁸³
- Pixels : SizeC⁴⁷⁸⁴
- Pixels : SizeT⁴⁷⁸⁵
- Pixels : SizeX⁴⁷⁸⁶
- Pixels : SizeY⁴⁷⁸⁷
- Pixels : SizeZ⁴⁷⁸⁸
- Pixels : Type⁴⁷⁸⁹
- Plane : TheC⁴⁷⁹⁰
- Plane : TheT⁴⁷⁹¹
- Plane : TheZ⁴⁷⁹²
- StageLabel : Name⁴⁷⁹³
- StageLabel : X⁴⁷⁹⁴
- StageLabel : Y⁴⁷⁹⁵
- StageLabel : Z⁴⁷⁹⁶

Total supported: 26

Total unknown or missing: 449

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁷⁹⁷ or the previous versions⁴⁷⁹⁸ page to find documentation for the version you are using.

18.2.137 ZeissLMSReader

This page lists supported metadata fields for the Bio-Formats Zeiss LMS format reader.

These fields are from the OME data model⁴⁷⁹⁹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 23 of them (4%).
- Of those, Bio-Formats fully or partially converts 23 (100%).

⁴⁷⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁴⁷⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁷⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁷⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁷⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁷⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁷⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁷⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁷⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁷⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁷⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁷⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Name

⁴⁷⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_X

⁴⁷⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Y

⁴⁷⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Z

⁴⁷⁹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷⁹⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁷⁹⁹<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Zeiss LMS format reader:

- Channel : ID⁴⁸⁰⁰
- Channel : SamplesPerPixel⁴⁸⁰¹
- Image : AcquisitionDate⁴⁸⁰²
- Image : ID⁴⁸⁰³
- Image : Name⁴⁸⁰⁴
- Instrument : ID⁴⁸⁰⁵
- Objective : ID⁴⁸⁰⁶
- Objective : NominalMagnification⁴⁸⁰⁷
- ObjectiveSettings : ID⁴⁸⁰⁸
- Pixels : BigEndian⁴⁸⁰⁹
- Pixels : DimensionOrder⁴⁸¹⁰
- Pixels : ID⁴⁸¹¹
- Pixels : Interleaved⁴⁸¹²
- Pixels : SignificantBits⁴⁸¹³
- Pixels : SizeC⁴⁸¹⁴
- Pixels : SizeT⁴⁸¹⁵
- Pixels : SizeX⁴⁸¹⁶
- Pixels : SizeY⁴⁸¹⁷
- Pixels : SizeZ⁴⁸¹⁸
- Pixels : Type⁴⁸¹⁹
- Plane : TheC⁴⁸²⁰
- Plane : TheT⁴⁸²¹
- Plane : TheZ⁴⁸²²

Total supported: 23

Total unknown or missing: 452

⁴⁸⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁸⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁸⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁸⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁸⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁸⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴⁸⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴⁸⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁴⁸⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁴⁸⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁸¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁸¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁸¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁸¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁸¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁸¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁸¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁸¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁸¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁸¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁸²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁸²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁸²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴⁸²³](#) or the [previous versions⁴⁸²⁴](#) page to find documentation for the version you are using.

18.2.138 ZeissTIFFReader

This page lists supported metadata fields for the Bio-Formats Zeiss AxioVision TIFF format reader.

These fields are from the [OME data model⁴⁸²⁵](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Zeiss AxioVision TIFF format reader:

- Channel : ID⁴⁸²⁶
- Channel : SamplesPerPixel⁴⁸²⁷
- Image : AcquisitionDate⁴⁸²⁸
- Image : ID⁴⁸²⁹
- Image : Name⁴⁸³⁰
- Pixels : BigEndian⁴⁸³¹
- Pixels : DimensionOrder⁴⁸³²
- Pixels : ID⁴⁸³³
- Pixels : Interleaved⁴⁸³⁴
- Pixels : SignificantBits⁴⁸³⁵
- Pixels : SizeC⁴⁸³⁶
- Pixels : SizeT⁴⁸³⁷
- Pixels : SizeX⁴⁸³⁸
- Pixels : SizeY⁴⁸³⁹
- Pixels : SizeZ⁴⁸⁴⁰
- Pixels : Type⁴⁸⁴¹

⁴⁸²³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁸²⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁸²⁵<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁸²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁸²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁸²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁸²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁸³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁸³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁸³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁸³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁸³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁸³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁸³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁸³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁸³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁸³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁸⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁸⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC⁴⁸⁴²
- Plane : TheT⁴⁸⁴³
- Plane : TheZ⁴⁸⁴⁴

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴⁸⁴⁵](#) or the [previous versions⁴⁸⁴⁶](#) page to find documentation for the version you are using.

18.2.139 ZeissZVIReader

This page lists supported metadata fields for the Bio-Formats Zeiss Vision Image (ZVI) format reader.

These fields are from the [OME data model⁴⁸⁴⁷](#). Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 19 of them (4%).
- Of those, Bio-Formats fully or partially converts 19 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Zeiss Vision Image (ZVI) format reader:

- Channel : ID⁴⁸⁴⁸
- Channel : SamplesPerPixel⁴⁸⁴⁹
- Image : AcquisitionDate⁴⁸⁵⁰
- Image : ID⁴⁸⁵¹
- Image : Name⁴⁸⁵²
- Pixels : BigEndian⁴⁸⁵³
- Pixels : DimensionOrder⁴⁸⁵⁴
- Pixels : ID⁴⁸⁵⁵
- Pixels : Interleaved⁴⁸⁵⁶
- Pixels : SignificantBits⁴⁸⁵⁷
- Pixels : SizeC⁴⁸⁵⁸

⁴⁸⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁸⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁸⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁸⁴⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁸⁴⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁸⁴⁷<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁸⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁸⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁸⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁸⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁸⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁸⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁸⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁸⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁸⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁸⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁸⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT⁴⁸⁵⁹
- Pixels : SizeX⁴⁸⁶⁰
- Pixels : SizeY⁴⁸⁶¹
- Pixels : SizeZ⁴⁸⁶²
- Pixels : Type⁴⁸⁶³
- Plane : TheC⁴⁸⁶⁴
- Plane : TheT⁴⁸⁶⁵
- Plane : TheZ⁴⁸⁶⁶

Total supported: 19

Total unknown or missing: 456

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁸⁶⁷ or the previous versions⁴⁸⁶⁸ page to find documentation for the version you are using.

18.2.140 ZeissCZIReader

This page lists supported metadata fields for the Bio-Formats Zeiss CZI format reader.

These fields are from the OME data model⁴⁸⁶⁹. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the *metadata summary table*:

- The file format itself supports 158 of them (33%).
- Of those, Bio-Formats fully or partially converts 158 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Zeiss CZI format reader:

- Arc : LotNumber⁴⁸⁷⁰
- Arc : Manufacturer⁴⁸⁷¹
- Arc : Model⁴⁸⁷²
- Arc : Power⁴⁸⁷³
- Arc : SerialNumber⁴⁸⁷⁴
- Channel : AcquisitionMode⁴⁸⁷⁵

⁴⁸⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁸⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁸⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁸⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁸⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁸⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁸⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁸⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁸⁶⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁸⁶⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁸⁶⁹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁸⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁸⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁸⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁸⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁴⁸⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁸⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_AcquisitionMode

- Channel : Color⁴⁸⁷⁶
- Channel : EmissionWavelength⁴⁸⁷⁷
- Channel : ExcitationWavelength⁴⁸⁷⁸
- Channel : FilterSetRef⁴⁸⁷⁹
- Channel : Fluor⁴⁸⁸⁰
- Channel : ID⁴⁸⁸¹
- Channel : IlluminationType⁴⁸⁸²
- Channel : Name⁴⁸⁸³
- Channel : PinholeSize⁴⁸⁸⁴
- Channel : SamplesPerPixel⁴⁸⁸⁵
- Detector : AmplificationGain⁴⁸⁸⁶
- Detector : Gain⁴⁸⁸⁷
- Detector : ID⁴⁸⁸⁸
- Detector : LotNumber⁴⁸⁸⁹
- Detector : Manufacturer⁴⁸⁹⁰
- Detector : Model⁴⁸⁹¹
- Detector : Offset⁴⁸⁹²
- Detector : SerialNumber⁴⁸⁹³
- Detector : Type⁴⁸⁹⁴
- Detector : Zoom⁴⁸⁹⁵
- DetectorSettings : Binning⁴⁸⁹⁶
- DetectorSettings : Gain⁴⁸⁹⁷
- DetectorSettings : ID⁴⁸⁹⁸
- Dichroic : ID⁴⁸⁹⁹
- Dichroic : LotNumber⁴⁹⁰⁰
- Dichroic : Manufacturer⁴⁹⁰¹

⁴⁸⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

⁴⁸⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁴⁸⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

⁴⁸⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterSetRef_ID

⁴⁸⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Fluor

⁴⁸⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁸⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_IlluminationType

⁴⁸⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁴⁸⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

⁴⁸⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁸⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_AmplificationGain

⁴⁸⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

⁴⁸⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴⁸⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁸⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁸⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁸⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

⁴⁸⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁸⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁴⁸⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Zoom

⁴⁸⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁴⁸⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁴⁸⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁴⁸⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

⁴⁹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

- Dichroic : Model⁴⁹⁰²
- Dichroic : SerialNumber⁴⁹⁰³
- Ellipse : ID⁴⁹⁰⁴
- Ellipse : RadiusX⁴⁹⁰⁵
- Ellipse : RadiusY⁴⁹⁰⁶
- Ellipse : Text⁴⁹⁰⁷
- Ellipse : X⁴⁹⁰⁸
- Ellipse : Y⁴⁹⁰⁹
- Experimenter : Email⁴⁹¹⁰
- Experimenter : FirstName⁴⁹¹¹
- Experimenter : ID⁴⁹¹²
- Experimenter : Institution⁴⁹¹³
- Experimenter : LastName⁴⁹¹⁴
- Experimenter : MiddleName⁴⁹¹⁵
- Experimenter : UserName⁴⁹¹⁶
- Filament : LotNumber⁴⁹¹⁷
- Filament : Manufacturer⁴⁹¹⁸
- Filament : Model⁴⁹¹⁹
- Filament : Power⁴⁹²⁰
- Filament : SerialNumber⁴⁹²¹
- Filter : FilterWheel⁴⁹²²
- Filter : ID⁴⁹²³
- Filter : LotNumber⁴⁹²⁴
- Filter : Manufacturer⁴⁹²⁵
- Filter : Model⁴⁹²⁶
- Filter : SerialNumber⁴⁹²⁷

⁴⁹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁴⁹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusX

⁴⁹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusY

⁴⁹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁴⁹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_X

⁴⁹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_Y

⁴⁹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_Email

⁴⁹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_FirstName

⁴⁹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

⁴⁹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_Institution

⁴⁹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

⁴⁹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_MiddleName

⁴⁹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_UserName

⁴⁹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁴⁹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_FilterWheel

⁴⁹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

⁴⁹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

- Filter : Type⁴⁹²⁸
- FilterSet : DichroicRef⁴⁹²⁹
- FilterSet : EmissionFilterRef⁴⁹³⁰
- FilterSet : ExcitationFilterRef⁴⁹³¹
- FilterSet : ID⁴⁹³²
- FilterSet : LotNumber⁴⁹³³
- FilterSet : Manufacturer⁴⁹³⁴
- FilterSet : Model⁴⁹³⁵
- FilterSet : SerialNumber⁴⁹³⁶
- Image : AcquisitionDate⁴⁹³⁷
- Image : Description⁴⁹³⁸
- Image : ExperimenterRef⁴⁹³⁹
- Image : ID⁴⁹⁴⁰
- Image : InstrumentRef⁴⁹⁴¹
- Image : Name⁴⁹⁴²
- Image : ROIRef⁴⁹⁴³
- ImagingEnvironment : AirPressure⁴⁹⁴⁴
- ImagingEnvironment : CO2Percent⁴⁹⁴⁵
- ImagingEnvironment : Humidity⁴⁹⁴⁶
- ImagingEnvironment : Temperature⁴⁹⁴⁷
- Instrument : ID⁴⁹⁴⁸
- Laser : LotNumber⁴⁹⁴⁹
- Laser : Manufacturer⁴⁹⁵⁰
- Laser : Model⁴⁹⁵¹
- Laser : Power⁴⁹⁵²
- Laser : SerialNumber⁴⁹⁵³

⁴⁹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_Type

⁴⁹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID

⁴⁹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

⁴⁹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

⁴⁹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterSet_ID

⁴⁹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID

⁴⁹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁴⁹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

⁴⁹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_AirPressure

⁴⁹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_CO2Percent

⁴⁹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Humidity

⁴⁹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

⁴⁹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴⁹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁴⁹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

- LightEmittingDiode : LotNumber⁴⁹⁵⁴
- LightEmittingDiode : Manufacturer⁴⁹⁵⁵
- LightEmittingDiode : Model⁴⁹⁵⁶
- LightEmittingDiode : Power⁴⁹⁵⁷
- LightEmittingDiode : SerialNumber⁴⁹⁵⁸
- Line : ID⁴⁹⁵⁹
- Line : Text⁴⁹⁶⁰
- Line : X1⁴⁹⁶¹
- Line : X2⁴⁹⁶²
- Line : Y1⁴⁹⁶³
- Line : Y2⁴⁹⁶⁴
- Microscope : LotNumber⁴⁹⁶⁵
- Microscope : Manufacturer⁴⁹⁶⁶
- Microscope : Model⁴⁹⁶⁷
- Microscope : SerialNumber⁴⁹⁶⁸
- Microscope : Type⁴⁹⁶⁹
- Objective : CalibratedMagnification⁴⁹⁷⁰
- Objective : Correction⁴⁹⁷¹
- Objective : ID⁴⁹⁷²
- Objective : Immersion⁴⁹⁷³
- Objective : Iris⁴⁹⁷⁴
- Objective : LensNA⁴⁹⁷⁵
- Objective : LotNumber⁴⁹⁷⁶
- Objective : Manufacturer⁴⁹⁷⁷
- Objective : Model⁴⁹⁷⁸
- Objective : NominalMagnification⁴⁹⁷⁹

⁴⁹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁴⁹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁴⁹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁴⁹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X1

⁴⁹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X2

⁴⁹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y1

⁴⁹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y2

⁴⁹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Microscope_Type

⁴⁹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

⁴⁹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁴⁹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴⁹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁴⁹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Iris

⁴⁹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

⁴⁹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

- Objective : SerialNumber⁴⁹⁸⁰
- Objective : WorkingDistance⁴⁹⁸¹
- ObjectiveSettings : CorrectionCollar⁴⁹⁸²
- ObjectiveSettings : ID⁴⁹⁸³
- ObjectiveSettings : Medium⁴⁹⁸⁴
- ObjectiveSettings : RefractiveIndex⁴⁹⁸⁵
- Pixels : BigEndian⁴⁹⁸⁶
- Pixels : DimensionOrder⁴⁹⁸⁷
- Pixels : ID⁴⁹⁸⁸
- Pixels : Interleaved⁴⁹⁸⁹
- Pixels : PhysicalSizeX⁴⁹⁹⁰
- Pixels : PhysicalSizeY⁴⁹⁹¹
- Pixels : PhysicalSizeZ⁴⁹⁹²
- Pixels : SignificantBits⁴⁹⁹³
- Pixels : SizeC⁴⁹⁹⁴
- Pixels : SizeT⁴⁹⁹⁵
- Pixels : SizeX⁴⁹⁹⁶
- Pixels : SizeY⁴⁹⁹⁷
- Pixels : SizeZ⁴⁹⁹⁸
- Pixels : Type⁴⁹⁹⁹
- Plane : DeltaT⁵⁰⁰⁰
- Plane : ExposureTime⁵⁰⁰¹
- Plane : PositionX⁵⁰⁰²
- Plane : PositionY⁵⁰⁰³
- Plane : PositionZ⁵⁰⁰⁴
- Plane : TheC⁵⁰⁰⁵

⁴⁹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

⁴⁹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_CorrectionCollar

⁴⁹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁴⁹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_Medium

⁴⁹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

⁴⁹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁴⁹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁵⁰⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁵⁰⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

⁵⁰⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

⁵⁰⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

⁵⁰⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

⁵⁰⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

- Plane : TheT⁵⁰⁰⁶
- Plane : TheZ⁵⁰⁰⁷
- Polygon : ID⁵⁰⁰⁸
- Polygon : Points⁵⁰⁰⁹
- Polygon : Text⁵⁰¹⁰
- Polyline : ID⁵⁰¹¹
- Polyline : Points⁵⁰¹²
- Polyline : Text⁵⁰¹³
- ROI : Description⁵⁰¹⁴
- ROI : ID⁵⁰¹⁵
- ROI : Name⁵⁰¹⁶
- Rectangle : Height⁵⁰¹⁷
- Rectangle : ID⁵⁰¹⁸
- Rectangle : Text⁵⁰¹⁹
- Rectangle : Width⁵⁰²⁰
- Rectangle : X⁵⁰²¹
- Rectangle : Y⁵⁰²²
- TransmittanceRange : CutIn⁵⁰²³
- TransmittanceRange : CutInTolerance⁵⁰²⁴
- TransmittanceRange : CutOut⁵⁰²⁵
- TransmittanceRange : CutOutTolerance⁵⁰²⁶
- TransmittanceRange : Transmittance⁵⁰²⁷

Total supported: 158

Total unknown or missing: 317

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version⁵⁰²⁸](#) or the [previous versions⁵⁰²⁹](#) page to find documentation for the version you are using.

⁵⁰⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁵⁰⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁵⁰⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

⁵⁰¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁵⁰¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polyline_Points

⁵⁰¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁵⁰¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Description

⁵⁰¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

⁵⁰¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Name

⁵⁰¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

⁵⁰¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁵⁰²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

⁵⁰²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

⁵⁰²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

⁵⁰²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn

⁵⁰²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutInTolerance

⁵⁰²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut

⁵⁰²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOutTolerance

⁵⁰²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_Transmittance

⁵⁰²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁰²⁹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.141 ZeissLSMReader

This page lists supported metadata fields for the Bio-Formats Zeiss Laser-Scanning Microscopy format reader.

These fields are from the [OME data model](#)⁵⁰³⁰. Bio-Formats standardizes each format's original metadata to and from the OME data model so that you can work with a particular piece of metadata (e.g. physical width of the image in microns) in a format-independent way.

Of the 475 fields documented in the [metadata summary table](#):

- The file format itself supports 101 of them (21%).
- Of those, Bio-Formats fully or partially converts 101 (100%).

Supported fields

These fields are fully supported by the Bio-Formats Zeiss Laser-Scanning Microscopy format reader:

- Channel : Color⁵⁰³¹
- Channel : ID⁵⁰³²
- Channel : Name⁵⁰³³
- Channel : PinholeSize⁵⁰³⁴
- Channel : SamplesPerPixel⁵⁰³⁵
- Detector : AmplificationGain⁵⁰³⁶
- Detector : Gain⁵⁰³⁷
- Detector : ID⁵⁰³⁸
- Detector : Type⁵⁰³⁹
- Detector : Zoom⁵⁰⁴⁰
- DetectorSettings : Binning⁵⁰⁴¹
- DetectorSettings : ID⁵⁰⁴²
- Dichroic : ID⁵⁰⁴³
- Dichroic : Model⁵⁰⁴⁴
- Ellipse : FontSize⁵⁰⁴⁵
- Ellipse : ID⁵⁰⁴⁶
- Ellipse : RadiusX⁵⁰⁴⁷
- Ellipse : RadiusY⁵⁰⁴⁸
- Ellipse : StrokeWidth⁵⁰⁴⁹

⁵⁰³⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁵⁰³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

⁵⁰³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁵⁰³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁵⁰³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

⁵⁰³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁵⁰³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_AmplificationGain

⁵⁰³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

⁵⁰³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁵⁰³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁵⁰⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Zoom

⁵⁰⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁵⁰⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁵⁰⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

⁵⁰⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁵⁰⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵⁰⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusX

⁵⁰⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusY

⁵⁰⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

- Ellipse : Transform⁵⁰⁵⁰
- Ellipse : X⁵⁰⁵¹
- Ellipse : Y⁵⁰⁵²
- Experimenter : ID⁵⁰⁵³
- Experimenter : UserName⁵⁰⁵⁴
- Filter : ID⁵⁰⁵⁵
- Filter : Model⁵⁰⁵⁶
- Filter : Type⁵⁰⁵⁷
- Image : AcquisitionDate⁵⁰⁵⁸
- Image : Description⁵⁰⁵⁹
- Image : ID⁵⁰⁶⁰
- Image : InstrumentRef⁵⁰⁶¹
- Image : Name⁵⁰⁶²
- Image : ROIRef⁵⁰⁶³
- Instrument : ID⁵⁰⁶⁴
- Label : FontSize⁵⁰⁶⁵
- Label : ID⁵⁰⁶⁶
- Label : StrokeWidth⁵⁰⁶⁷
- Label : Text⁵⁰⁶⁸
- Label : X⁵⁰⁶⁹
- Label : Y⁵⁰⁷⁰
- Laser : ID⁵⁰⁷¹
- Laser : LaserMedium⁵⁰⁷²
- Laser : Model⁵⁰⁷³
- Laser : Type⁵⁰⁷⁴
- Laser : Wavelength⁵⁰⁷⁵

⁵⁰⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

⁵⁰⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_X

⁵⁰⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_Y

⁵⁰⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

⁵⁰⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_UserName

⁵⁰⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

⁵⁰⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁵⁰⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_Type

⁵⁰⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁵⁰⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁵⁰⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁵⁰⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁵⁰⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁵⁰⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

⁵⁰⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁵⁰⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵⁰⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

⁵⁰⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁵⁰⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_X

⁵⁰⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_Y

⁵⁰⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

⁵⁰⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

⁵⁰⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁵⁰⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

⁵⁰⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

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⁵⁰⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID

⁵⁰⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

⁵⁰⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵⁰⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

⁵⁰⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X1

⁵⁰⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X2

⁵⁰⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y1

⁵⁰⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y2

⁵⁰⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁵⁰⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁵⁰⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁵⁰⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Iris

⁵⁰⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

⁵⁰⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁵⁰⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁵⁰⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁵⁰⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁵⁰⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁵⁰⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁵⁰⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁵⁰⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁵⁰⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁵⁰⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁵¹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁵¹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

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⁵¹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁵¹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁵¹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁵¹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

⁵¹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁵¹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁵¹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

⁵¹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

⁵¹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

⁵¹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁵¹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁵¹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁵¹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵¹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵¹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

⁵¹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

⁵¹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵¹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵¹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polyline_Points

⁵¹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

⁵¹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

⁵¹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵¹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

⁵¹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵¹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

⁵¹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

- Rectangle : X⁵¹²⁸
- Rectangle : Y⁵¹²⁹
- TransmittanceRange : CutIn⁵¹³⁰
- TransmittanceRange : CutOut⁵¹³¹

Total supported: 101

Total unknown or missing: 374

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁵¹³² or the previous versions⁵¹³³ page to find documentation for the version you are using.

⁵¹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

⁵¹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

⁵¹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn

⁵¹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut

⁵¹³²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵¹³³<http://www.openmicroscopy.org/site/support/legacy/>

GROUPING FILES USING A PATTERN FILE

Individual files can be grouped together into a single fileset using a pattern file. This works for any single-file format that Bio-Formats supports, as long as all files are in the same format. It is most useful for sets of TIFF, JPEG, PNG, etc. files that do not have any associated metadata.

All files to be grouped together should be in the same folder. The pattern file should be in the same folder as the other files; it can have any name, but must have the `.pattern` extension. The pattern file is what must be opened or imported, so it may be helpful to give it a descriptive or easily-recognizable name.

The pattern file contains a single line of text that is specially formatted to describe how the files should be grouped. The file can be created in any text editor.

The text in the pattern file can take one of several forms. To illustrate, consider a folder with the following file names:

```
red.tiff
green.tiff
blue.tiff
test_Z0_C0.png
test_Z1_C0.png
test_Z0_C1.png
test_Z1_C1.png
test_Z0_C2.png
test_Z1_C2.png
test_Z00.tiff
test_Z01.tiff
```

A pattern file that groups `red.tiff`, `green.tiff`, and `blue.tiff` in that order would look like:

```
<red, green, blue>.tiff
```

A pattern that groups `test_Z0_C0.png`, `test_Z1_C0.png`, `test_Z0_C2.png`, and `test_Z1_C2.png`:

```
test_Z<0-1>_C<0-2:2>.png
```

The `<>` notation in general can accept a single literal value, a comma-separated list of literal values, a range of integer values, or a range of integer values with a step value greater than 1 (the range and step are separated by `:`). Note that inverting the values in a range (e.g. `<2-0>`) is not supported and will cause an exception to be thrown.

The characters immediately preceding the `<` can affect which dimension is assigned to the specified values. The values will be interpreted as:

- channels, if `c`, `ch`, `w`, or `wavelength` precede `<`
- timepoints, if `t`, `tl`, `tp`, or `timepoint` precede `<`
- Z sections, if `z`, `zs`, `sec`, `fp`, `focal`, or `focalplane` precede `<`
- series, if `s`, `sp`, or `series` precede `<`

Note that the listed dimension specifier characters are case insensitive. A separator character (underscore or space) must precede the dimension specifier if it is not at the beginning of the filename. In the above example, 2 Z sections and 2 out of 3 channels would be detected according to the dimension specifiers.

Leading zeros in the integer values must be specified. To group `test_Z00.tif` and `test_Z01.tif`:

```
test_Z<00-01>.tif
```

or:

```
test_Z0<0-1>.tif
```

Note that this pattern would not group the files correctly:

```
test_Z<0-1>.tif
```

A pattern file that groups all PNG files beginning with `test_` would look like:

```
test_.*.png
```

This and most other Java-style regular expressions can be used in place of the `<>` notation above. See [the `java.util.regex.Pattern` Javadoc](http://docs.oracle.com/javase/6/docs/api/java/util/regex/Pattern.html)¹ for more information on constructing regular expressions.

¹<http://docs.oracle.com/javase/6/docs/api/java/util/regex/Pattern.html>

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