



Bio-Formats Documentation

Release 5.1.1

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>

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](http://www.openmicroscopy.org/site/support/ome-model/ome-xml)¹, according to the [OME-XML](http://www.openmicroscopy.org/site/support/ome-model/ome-tiff)² specification. We have defined an open exchange format called [OME-TIFF](http://www.openmicroscopy.org/site/support/ome-model/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](http://www.openmicroscopy.org/site/support/ome-model/ome-xml/java-library.html)⁴ for reading and writing [OME-XML](http://www.openmicroscopy.org/site/support/ome-model/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.

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>

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
- [Fiji Bugzilla \(for ImageJ/Fiji issues\)](#)³
- [ome-devel mailing list](#)⁴ (searchable using google with ‘site:lists.openmicroscopy.org.uk’)
- [ome-users mailing list](#)⁵ (searchable using google with ‘site:lists.openmicroscopy.org.uk’)
- [ImageJ mailing list \(for ImageJ/Fiji issues\)](#)⁶

Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)⁷ or the [previous versions](#)⁸ page to find documentation for the version you are using.

3.1 Reporting a bug

3.1.1 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](#)⁹. If you are not sure which version you need, select the latest build of the Bio-Formats package bundle from the components table.

3.1.2 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.

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

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

³<http://fiji.sc/cgi-bin/bugzilla/index.cgi>

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

⁵<http://lists.openmicroscopy.org.uk/pipermail/ome-users>

⁶<http://imagej.1557.n6.nabble.com/>

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

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

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

- 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](#)¹⁰. 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 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.

3.1.3 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](#)¹¹. You can upload files to our [QA system](#)¹² 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.

¹⁰http://en.wikipedia.org/wiki/Resource_fork#The_Macintosh_file_system

¹¹<http://lists.openmicroscopy.org.uk/mailman/listinfo/ome-users>

¹²<http://qa.openmicroscopy.org.uk/qa/upload/>

BIO-FORMATS VERSIONS

Bio-Formats is updated whenever a new version of **OMERO**¹ is released. 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.

Note: This documentation is for the new **Bio-Formats 5.1** version. See the [latest Bio-Formats 5.0.x version](#)² or the [previous versions](#)³ page to find documentation for the version you are using.

4.1 Version history

4.1.1 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
 - **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

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

²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³<http://www.openmicroscopy.org/site/support/legacy/>

- **ICS export**

- * fix writing of files larger than 2GB

4.1.2 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*⁴
- 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
 - * 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

⁴<http://www.openmicroscopy.org/site/support/ome-model/schemas/january-2015.html>

- **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

4.1.3 5.0.8 (2015 February 10)

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

4.1.4 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

4.1.5 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

4.1.6 5.0.5 (2014 September 23)

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

4.1.7 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)

4.1.8 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

4.1.9 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

4.1.10 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)

4.1.11 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*

4.1.12 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

4.1.13 5.0.0-beta1 (2013 June 20)

- Updated to 2013-06 OME-XML schema⁵
- Improved the performance in tiled formats

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

- 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

4.1.14 4.4.10 (2014 Jan 15)

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

4.1.15 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

4.1.16 4.4.8 (2013 May 2)

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

4.1.17 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.

4.1.18 4.4.6 (2013 February 11)

- Many bug fixes
- Further documentation improvements

4.1.19 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

4.1.20 4.4.4 (2012 September 24)

- Many bug fixes

4.1.21 4.4.2 (2012 August 22)

- Security fix for OMERO plugins for ImageJ

4.1.22 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

4.1.23 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

4.1.24 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

4.1.25 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

4.1.26 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

4.1.27 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

4.1.28 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

4.1.29 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

4.1.30 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

4.1.31 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

4.1.32 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

4.1.33 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

4.1.34 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

4.1.35 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

4.1.36 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

4.1.37 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

4.1.38 2008 Feb 12

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

4.1.39 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

4.1.40 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

4.1.41 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 1.39I
- Support for hyperstacks and virtual stacks in ImageJ - requires ImageJ 1.39I
- 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

4.1.42 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

4.1.43 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

4.1.44 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

4.1.45 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

4.1.46 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

4.1.47 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

4.1.48 2007 July 16

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

4.1.49 2007 July 2

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

4.1.50 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

4.1.51 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

4.1.52 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

4.1.53 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

4.1.54 2007 Mar 16

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

4.1.55 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

4.1.56 2007 Feb 28

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

4.1.57 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

4.1.58 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

4.1.59 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

4.1.60 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

4.1.61 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

4.1.62 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

4.1.63 2006 Oct 31

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

4.1.64 2006 Oct 30

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

4.1.65 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

4.1.66 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

4.1.67 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

4.1.68 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

4.1.69 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 version⁶](#) or the [previous versions⁷](#) page to find documentation for the version you are using.

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

⁷<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 version](#)²⁵ or the [previous versions](#)²⁶ 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 calibration*²⁷ 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-TIFF*²⁸ 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/>

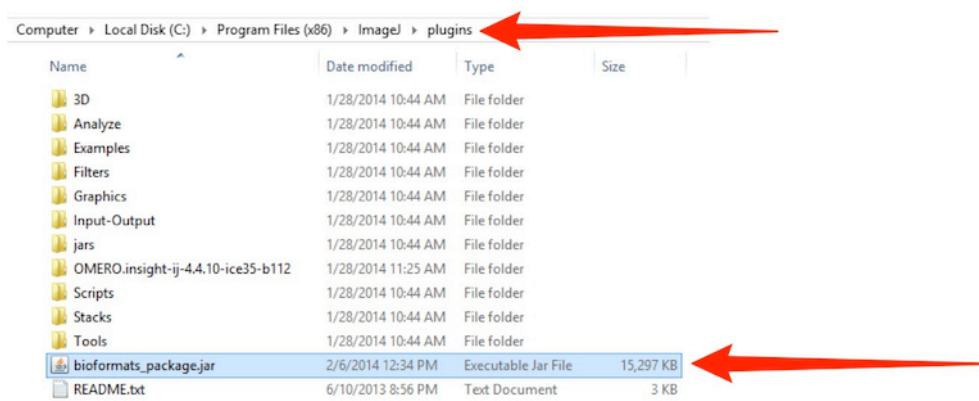
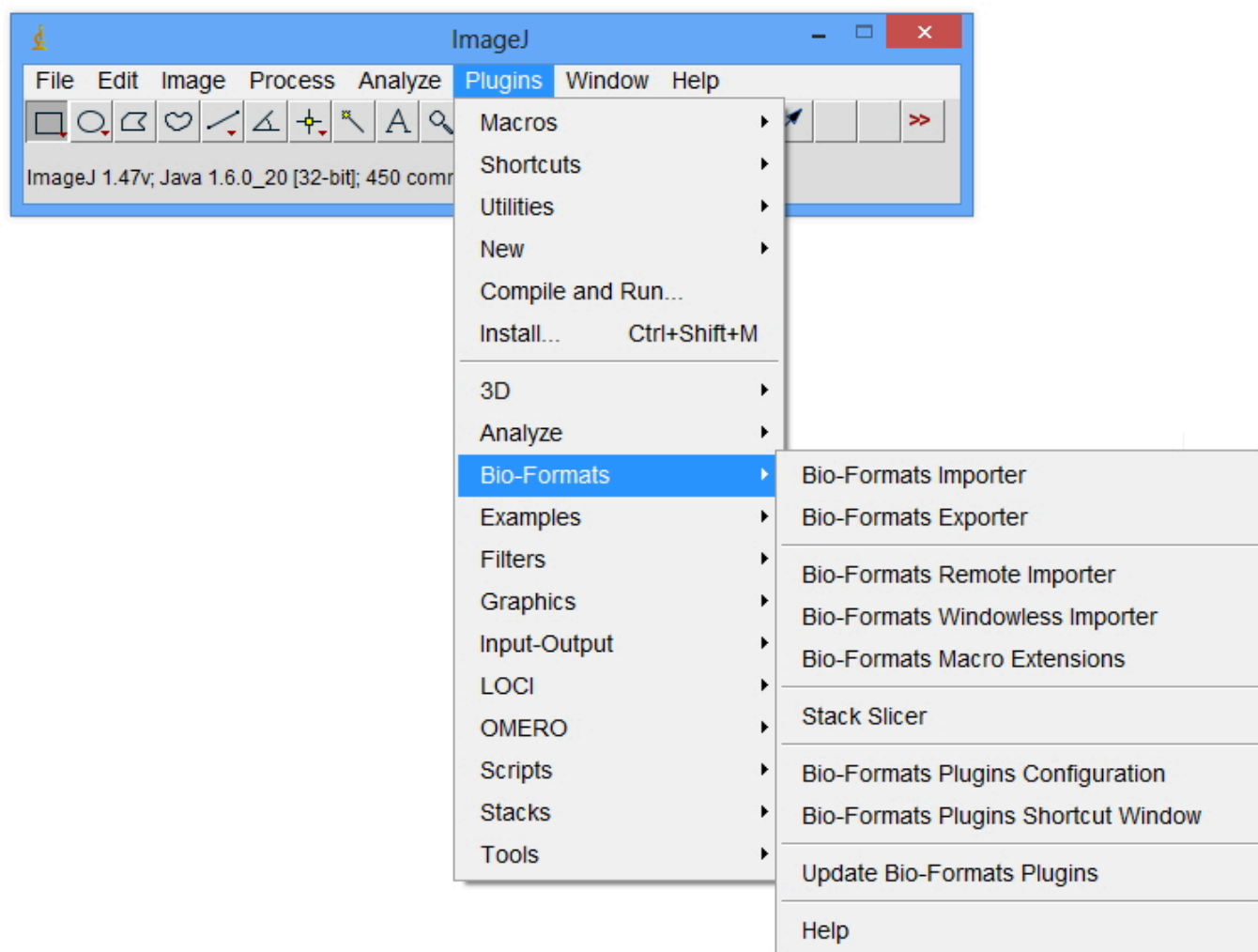


Figure 5.1: Plugin Directory for ImageJ: Where in ImageJ's file structure you should place the file once you downloaded it.

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

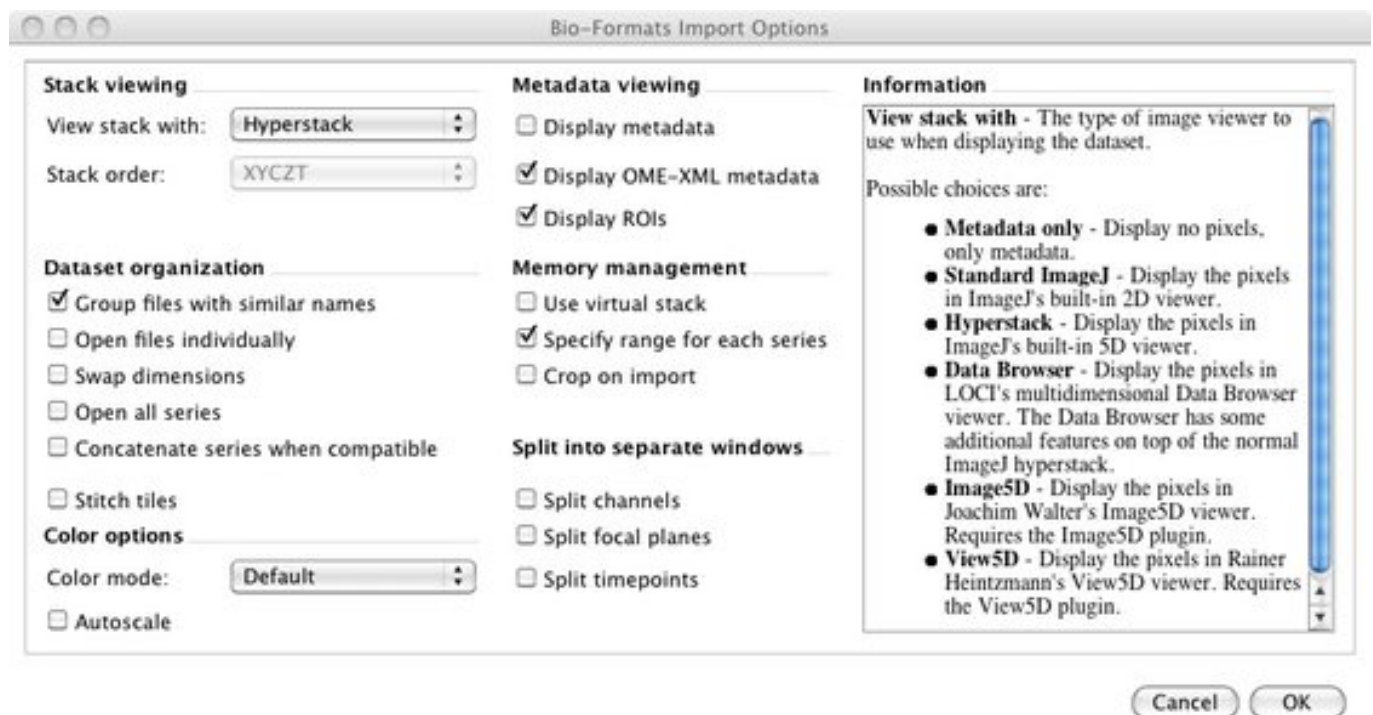
This section will explain how to use Bio-Formats to import files into ImageJ and how to use the settings on the Bio-Formats Import Options screen.

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:

The list of files to be grouped can be specified in one of three ways:

☐ Axis 1 number of images: 85

Axis 1 axis first image: 1

Axis 1 axis increment: 1

☐ File name contains:

☒ Pattern: sers/JasonPalmer/Desktop/Sample Data/dub/dub<01-85>.pic

OK Cancel

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”.

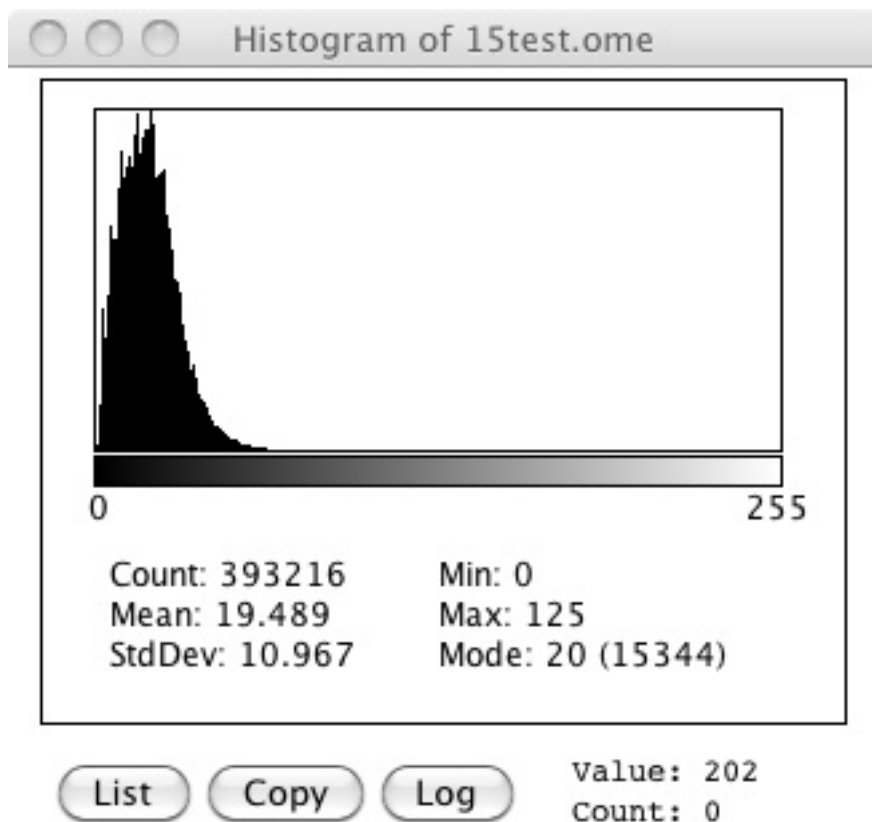
It can also accept a [Java regular expression](#)³⁹.

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:

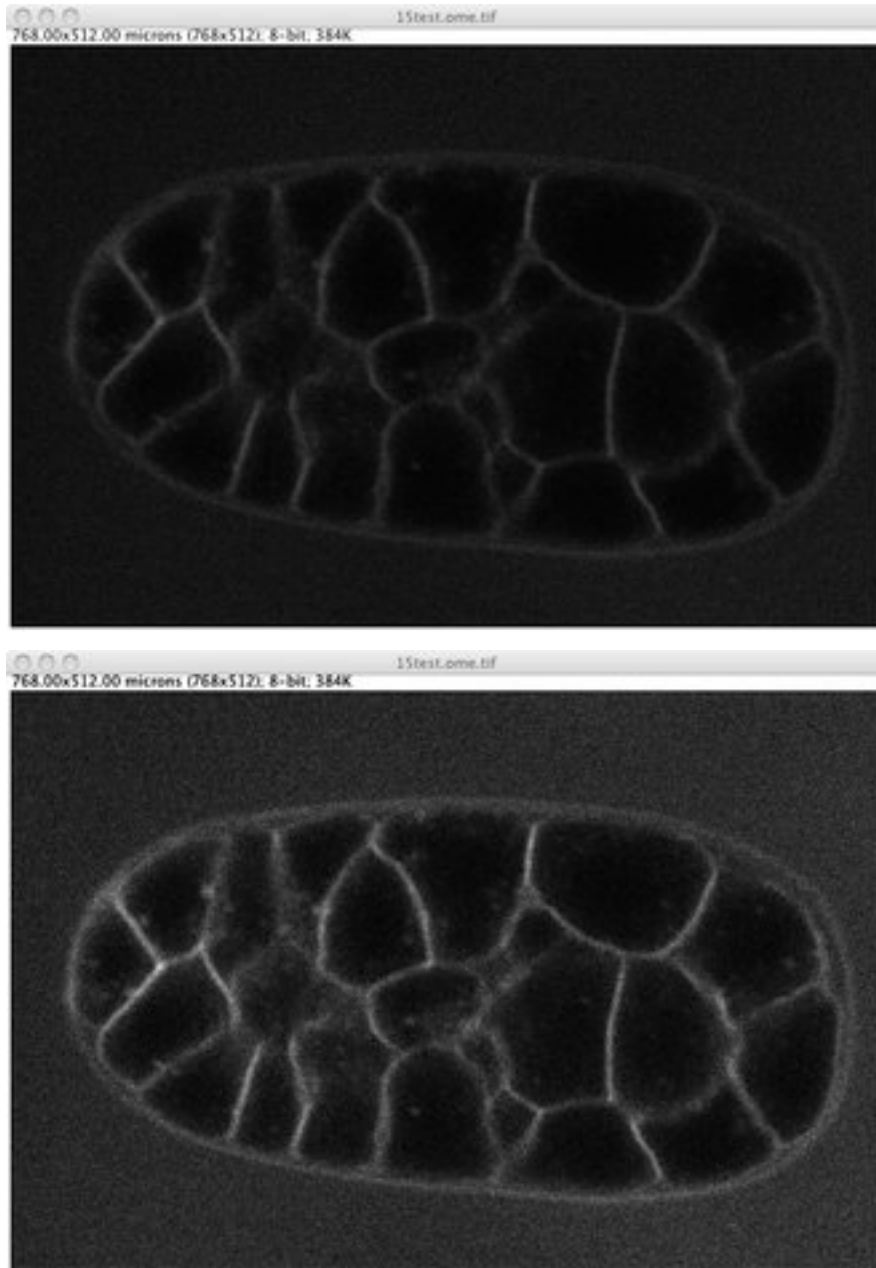


Notice that the histogram heavily skews right. Even though there are 256 possible values, only 0 through 125 are being used.

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.

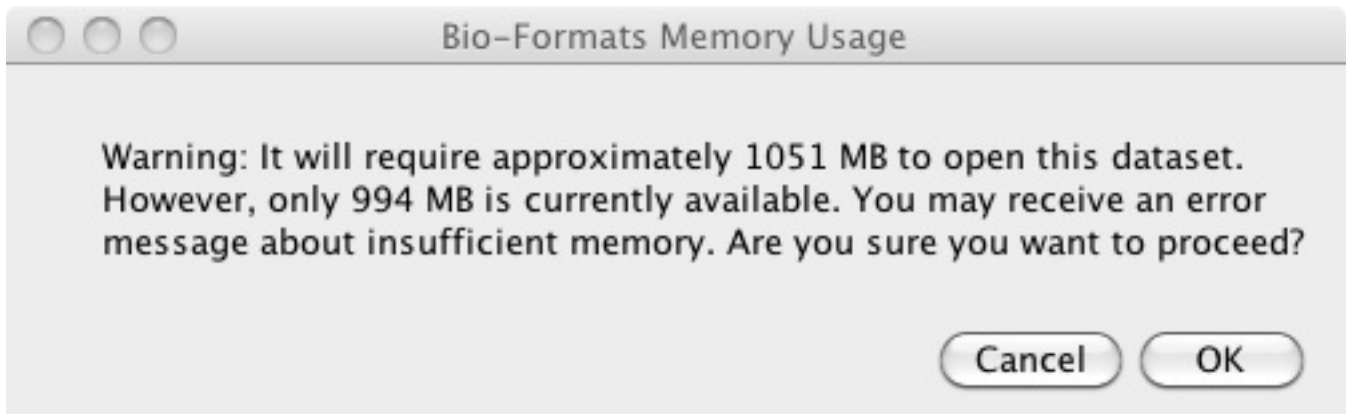
Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁴⁰](#) or the [previous versions⁴¹](#) page to find documentation for the version you are using.

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:

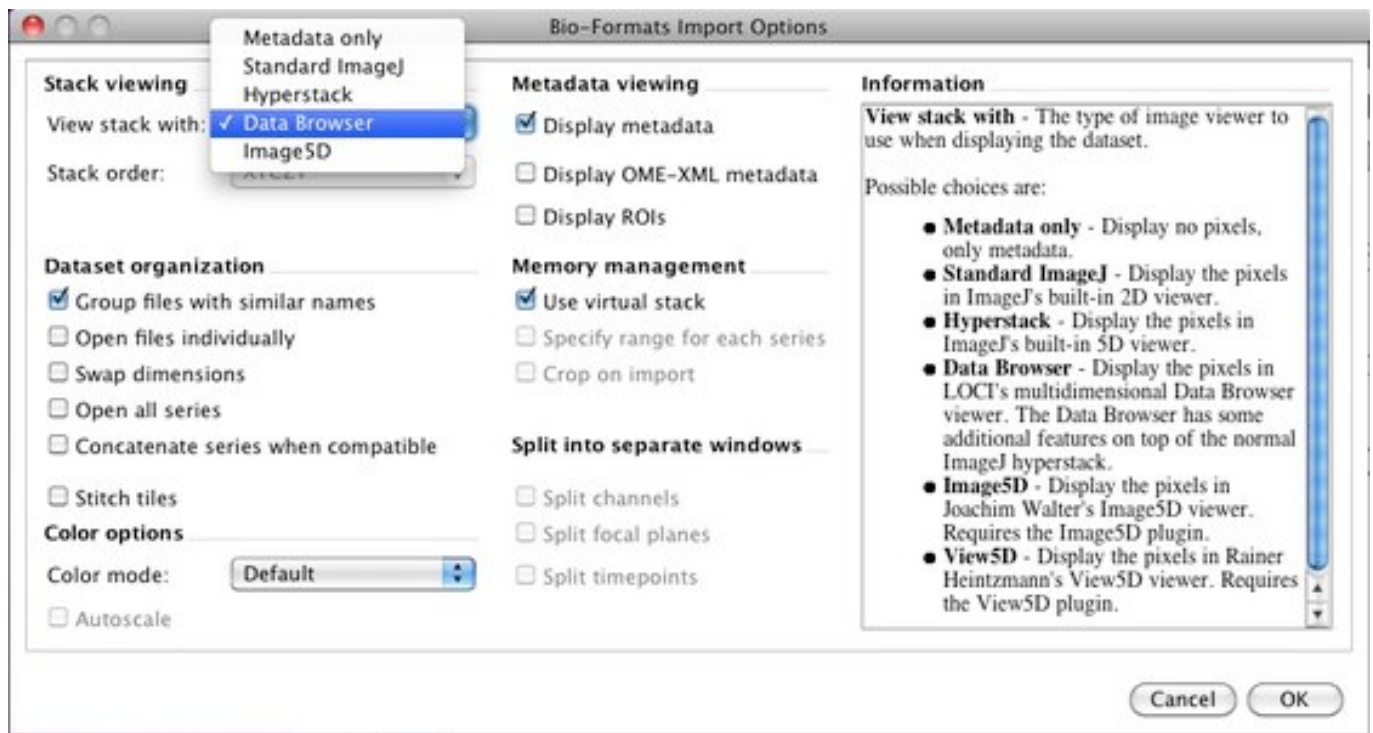
- View your stack with Data Browser
- Crop the view area
- Open only a subset of images
- Use Virtual Stack
- Increase ImageJ/Fiji's memory.

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.

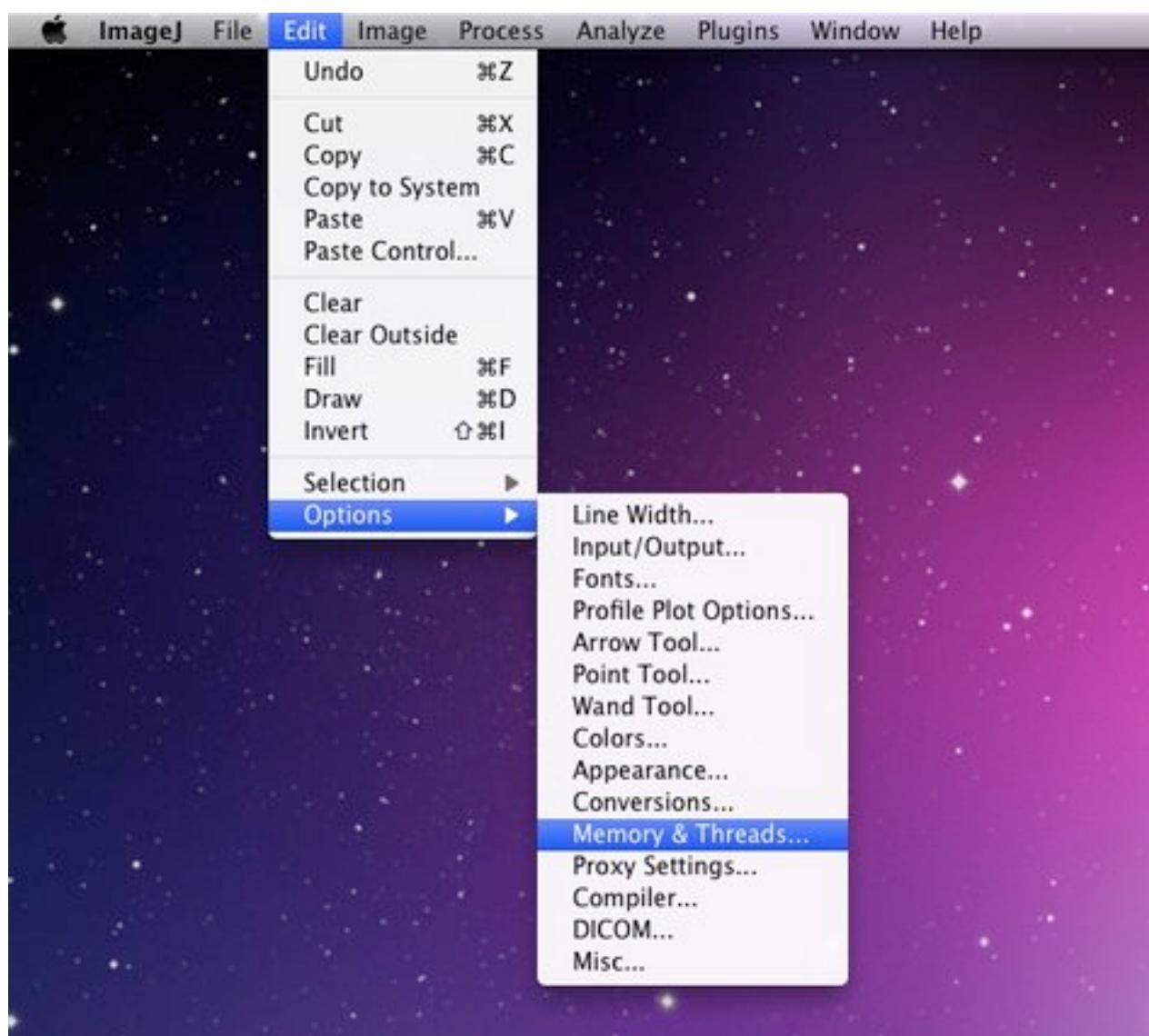
5.6.4 Use Virtual Stack

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.

To display a different series, for example the second one:

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

Note that series numbers begin with 0.

To display the OME-XML metadata for a file on the console:

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

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

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

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.

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.

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-update /path/to/file
```

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
```

Most output can be suppressed:

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

and to display the OME-XML alone:

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

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

Debugging output can also be enabled if more information is needed:

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

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.

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.

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
```

To convert only one timepoint:

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

To convert only one channel:

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

To convert only one Z section:

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

To convert images between certain indices (inclusive):

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

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

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

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 pixel 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.

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
```

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
```

or always exit without overwriting:

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

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.

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

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

For example:

```
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.

Current usage information can be shown by running:

```
formatlist -help
```

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

```
formatlist
```

This can also be accomplished using by specifying the `-txt` argument:

```
formatlist -txt
```

The same information also be formatted as HTML:

```
formatlist -html
```

or XML:

```
formatlist -xml
```

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.

6.9 Format XML data

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

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/>

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](#)).

To change the number of plates in the screen:

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

To change the number of acquisitions for each plate:

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

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

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

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

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

To change the number of fields per well:

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

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

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

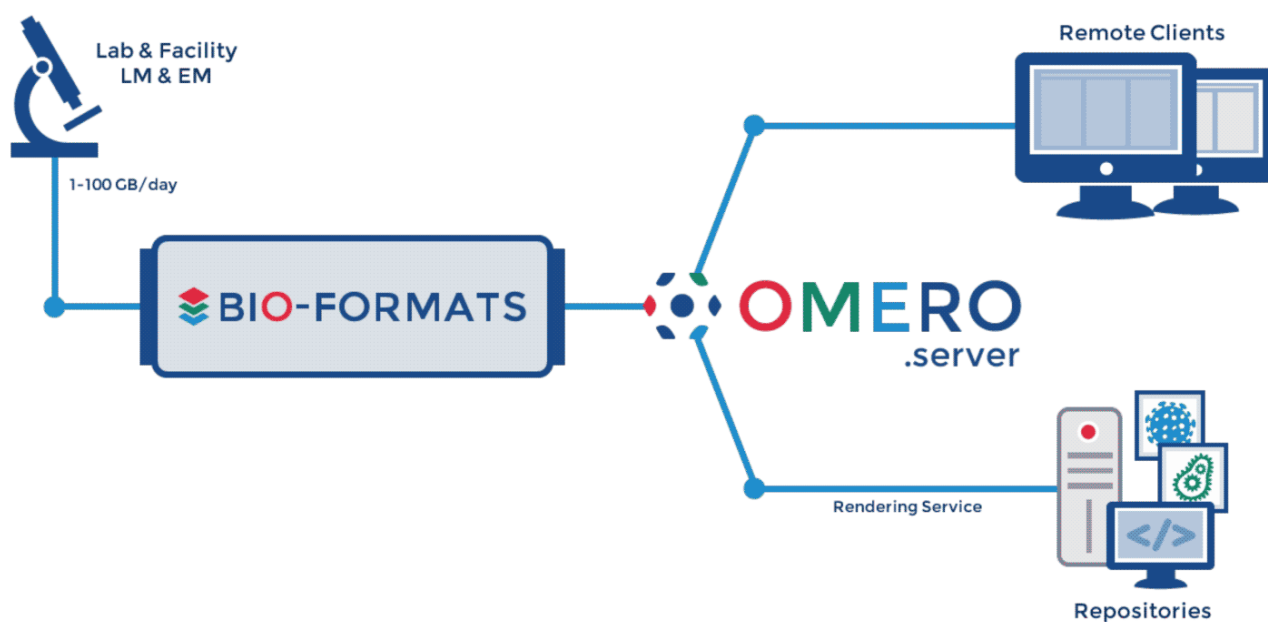
```
mkfake -rows 16 -columns 24 -plates 2 -fields 3 two-384-well-plates.fake
```

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 `bf-matlab` 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>

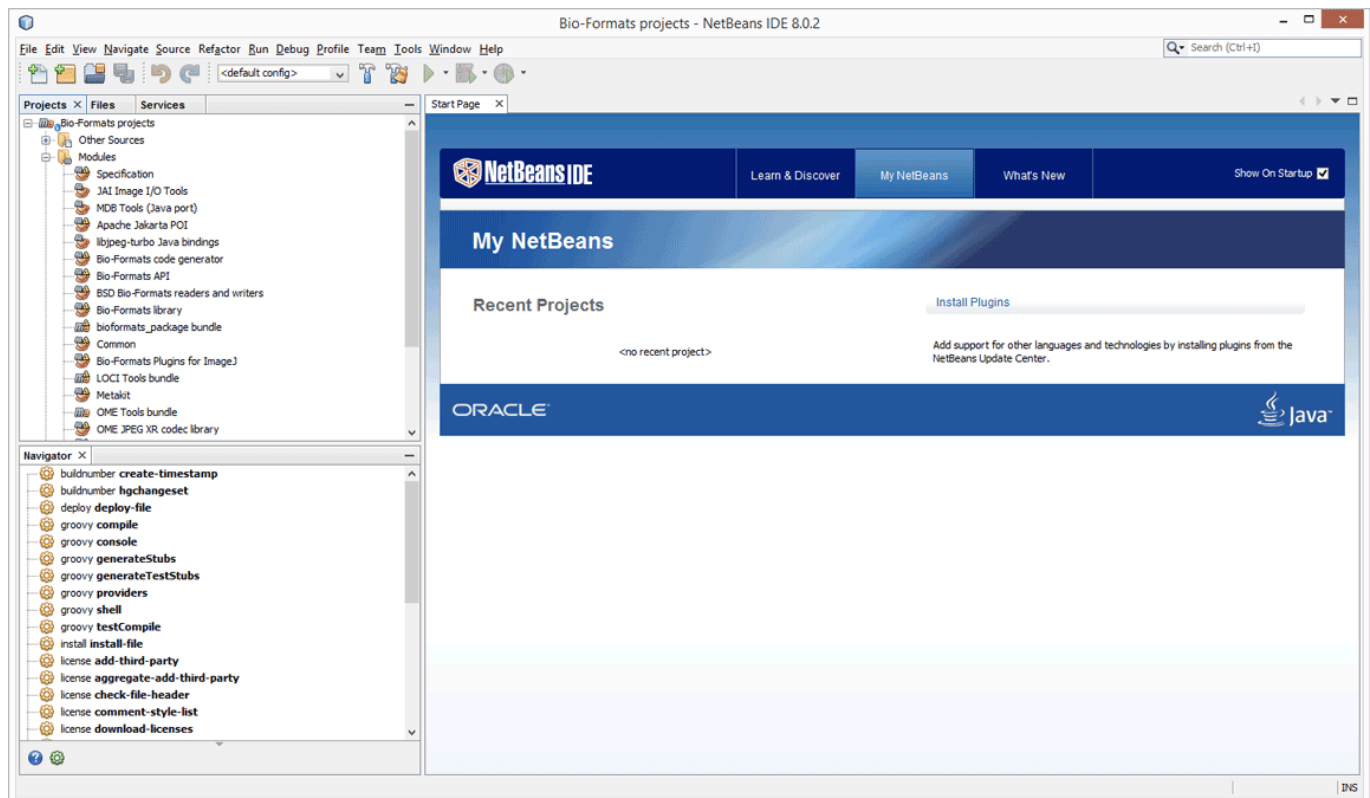
¹⁴<http://genshi.edgewall.org>

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 eclipse](#)¹⁶

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> ⁶¹
image height	<code>getSizeY()</code> ⁶²
number of series per file	<code>getSeriesCount()</code> ⁶³
total number of images per series	<code>getImageCount()</code> ⁶⁴
number of slices in the current series	<code>getSizeZ()</code> ⁶⁵
number of timepoints in the current series	<code>getSizeT()</code> ⁶⁶
number of actual channels in the current series	<code>getSizeC()</code> ⁶⁷
number of channels per image	<code>getRGBChannelCount()</code> ⁶⁸
the ordering of the images within the current series	<code>getDimensionOrder()</code> ⁶⁹
whether each image is RGB	<code>isRGB()</code> ⁷⁰
whether the pixel bytes are in little-endian order	<code>isLittleEndian()</code> ⁷¹
whether the channels in an image are interleaved	<code>isInterleaved()</code> ⁷²
the type of pixel data in this file	<code>getPixelType()</code> ⁷³

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)`⁷⁴, 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:

IFormatReader⁷⁵ Source code of the `loci.formats.IFormatReader` interface

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`⁷⁶ 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:

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#getMetadataValue\(java.lang.String\)](http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatReader.html#getMetadataValue(java.lang.String))

⁷⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ReaderWrapper.html>

Wrapper reader	Functionality
loci.formats.BufferedImageReader ⁷⁷	Allows pixel data to be returned as BufferedImages instead of raw byte arrays
loci.formats.FileStitcher ⁷⁸	Uses advanced pattern matching heuristics to group files that belong to the same dataset
loci.formats.ChannelSeparator ⁷⁹	Makes sure that all planes are grayscale - RGB images are split into 3 separate grayscale images
loci.formats.ChannelMerger ⁸⁰	Merges grayscale images to RGB if the number of channels is greater than 1
loci.formats.ChannelFiller ⁸¹	Converts indexed color images to RGB images
loci.formats.MinMaxCalculator ⁸²	Provides an API for retrieving the minimum and maximum pixel values for each channel
loci.formats.DimensionSwapper ⁸³	Provides an API for changing the dimension order of a file
loci.formats.Memoizer ⁸⁴	Caches the state of the reader into a memoization file

- [loci.formats.ImageTools](#)⁸⁵ and [loci.formats.gui.AWTImageTools](#)⁸⁶ provide a number of methods for manipulating Buffered-Images 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](#)⁸⁷ or the [previous versions](#)⁸⁸ page to find documentation for the version you are using.

12.5 Writing files

The [loci.formats.IFormatWriter](#)⁸⁹ 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)

⁷⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/gui/BufferedImageReader.html>

⁷⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FileStitcher.html>

⁷⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ChannelSeparator.html>

⁸⁰<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ChannelMerger.html>

⁸¹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ChannelFiller.html>

⁸²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/MinMaxCalculator.html>

⁸³<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/DimensionSwapper.html>

⁸⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html>

⁸⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ImageTools.html>

⁸⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/gui/AWTImageTools.html>

⁸⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁸⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/IFormatWriter.html>

- 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:

IFormatWriter⁹⁰ Source code of the `loci.formats.IFormatWriter` interface

loci.formats.tools.ImageConverter⁹¹ 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

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 ⁵ MDB Tools ⁷	ome-poi.jar ⁶ mdbtools-java.jar ⁸	Apache LGPL	OME fork; for OLE-based formats (zvi, oib, ipw, cxd) Java port, OME fork; for Olympus CellR and Zeiss LSM metadata (mdb)
JAI Image I/O Tools ⁹	jai_imageio.jar ¹⁰	BSD	Pure Java implementation, OME fork; for JPEG2000-based formats (nd2, jp2)
NetCDF ¹¹	netcdf-4.3.19.jar ¹²	LGPL	Java library; for HDF5-based formats (Imaris 5.5, MINC MRI)
QuickTime for Java ¹³	QTJava.zip	Commercial	For additional QuickTime codecs

See the list in the [Bio-Formats toplevel build file¹⁴](#) for a complete and up-to-date list of all optional libraries, which can all be found in our [Git repository¹⁵](#).

13.1.1 Examples of usage

MinimumWriter¹⁶ - A command line utility demonstrating the minimum amount of metadata needed to write a file.

ImageConverter¹⁷ - A simple command line tool for converting between formats.

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<https://github.com/openmicroscopy/bioformats/blob/develop/build.xml>

¹⁵<https://github.com/openmicroscopy/bioformats/tree/develop/jar>

¹⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/utis/MinimumWriter.java>

¹⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-tools/src/loci/formats/tools/ImageConverter.java>

ImageInfo¹⁸ - 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.

PrintTimestamps¹⁹ - A command line example demonstrating how to extract timestamps from a file.

Simple_Read²⁰ - A simple ImageJ plugin demonstrating how to use Bio-Formats to read files into ImageJ (see *ImageJ overview*).

Read_Image²¹ - An ImageJ plugin that uses Bio-Formats to build up an image stack, reading image planes one by one (see *ImageJ overview*).

Mass_Importer²² - 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`²³ file of the distribution. You can also read our notes about each in the source distribution's `Ant build.xml`²⁴ script.

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.

13.2 Exporting files using Bio-Formats

This guide pertains to version 4.2 and later.

13.2.1 Basic conversion

The first thing we need to do is set up a reader:

¹⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-tools/src/loci/formats/tools/ImageInfo.java>

¹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/utis/PrintTimestamps.java>

²⁰https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utis/Simple_Read.java

²¹https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utis/Read_Image.java

²²https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-plugins/utis/Mass_Importer.java

²³<https://github.com/openmicroscopy/bioformats/blob/develop/ant/toplevel.properties>

²⁴<https://github.com/openmicroscopy/bioformats/blob/develop/build.xml#L240>

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

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


```
// 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 tickets²⁷

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁸ or the [previous versions](#)²⁹ 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:

²⁷<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-
²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
²⁹<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/)³⁰ or the [previous versions](http://www.openmicroscopy.org/site/support/legacy/)³¹ 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");

```

³⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹<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 version³²](#) or the [previous versions³³](#) 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).

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:

```
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.

See also:

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

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

<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?

13.5.2 Opening an image file

The first thing to do is initialize a file with the `bfopen`³⁴ 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:

```
data = bfopen('/path/to/data/file');
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};
series1_plane3 = series1{3, 1};
series1_label3 = series1{3, 2};
% ...etc.
```

Displaying images

If you want to display one of the images, you can do so as follows:

```
data = bfopen('/path/to/data/file');
% plot the 1st series's 1st image plane in a new figure
series1 = data{1, 1};
series1_plane1 = series1{1, 1};
series1_label1 = series1{1, 2};
series1_colorMaps = data{1, 3};
figure('Name', series1_label1);
if (isempty(series1_colorMaps{1}))
    colormap(gray);
```

³⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/bfopen.m>

```

else
    colormap(series1_colorMaps{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
movie(M);

```

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 `b fopen`.
- **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 `b fopen`, and contains common metadata values such as physical pixel sizes, instrument settings, and much more. See the [OME Model and Formats](#)³⁵ documentation for full details.

Original metadata

To retrieve the metadata value for specific keys:

```

data = b fopen('/path/to/data/file');
% Query some metadata fields (keys are format-dependent)
metadata = data{1, 2};
subject = metadata.get('Subject');
title = metadata.get('Title');

```

To print out all of the metadata key/value pairs for the first series:

```

data = b fopen('/path/to/data/file');
metadata = data{1, 2};
metadataKeys = metadata.keySet().iterator();
for i=1:metadata.size()
    key = metadataKeys.nextElement();
    value = metadata.get(key);
    fprintf('%s = %s\n', key, value)
end

```

³⁵<http://www.openmicroscopy.org/site/support/ome-model/>

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:

```
data = bfopen('/path/to/data/file');
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

voxelSizeXdefaultValue = omeMeta.getPixelsPhysicalSizeX(0).value(); % returns value in 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 in µm
voxelSizeY = omeMeta.getPixelsPhysicalSizeY(0).value(ome.units.UNITS.MICROM); % in µm
voxelSizeYdouble = voxelSizeY.doubleValue(); % The numeric value represented in µm
voxelSizeZ = omeMeta.getPixelsPhysicalSizeZ(0).value(ome.units.UNITS.MICROM); % in µm
voxelSizeZdouble = voxelSizeZ.doubleValue(); % The numeric value represented in µm
```

For more information about the methods to retrieve the metadata, see the [MetadataRetrieve](#)³⁶ 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`³⁷ 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`³⁸ 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`³⁹ function:

```
series1_plane1 = bfGetPlane(reader, 1);
```

To switch between series in a multi-image file, use the `setSeries(int)`⁴⁰ method. To retrieve a plane given a set of (*z*, *c*, *t*) coordinates, these coordinates must be linearized first using `getIndex(int, int, int)`⁴¹

```
% 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);
```

³⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/meta/MetadataRetrieve.html>

³⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/bfopen.m>

³⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/bfGetReader.m>

³⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/bfGetPlane.m>

⁴⁰[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))

⁴¹[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))

```
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`⁴² 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, 'my-file.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, 'my-file.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`⁴³, add custom metadata and pass this object directly to `bfsave`:

```
plane = zeros(64, 64, 1, 2, 2, 'uint8');
metadata = createMinimalOMEXMLMetadata(plane);
pixelSize = ome.xml.model.primitives.PositiveFloat(java.lang.Double(.05));
metadata.setPixelsPhysicalSizeX(pixelSize, 0);
metadata.setPixelsPhysicalSizeY(pixelSize, 0);
pixelSizeZ = ome.xml.model.primitives.PositiveFloat(java.lang.Double(.2));
metadata.setPixelsPhysicalSizeZ(pixelSizeZ, 0);
...
bfsave(plane, 'my-file.ome.tiff', 'metadata', metadata);
```

For more information about the methods to store the metadata, see the `MetadataStore`⁴⁴ 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 spend in the `setId(java.lang.String)`⁴⁵ 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`⁴⁶ reader wrapper. By essence, the speedup gained from memoization will only happen after the first initialization of the reader for a particular file.

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
```

⁴²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/bfsave.m>

⁴³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/matlab/createMinimalOMEXMLMetadata.m>

⁴⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/meta/MetadataStore.html>

⁴⁵[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))

⁴⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html>

```
% be cached in a file under the same directory as the initial file
% name .large_file.bfmemo
r.setId('/path/to/large_file');

% 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('/path/to/large_file');

% Perform additional work

% Close the reader
r.close()
```

If the time required to call `setId(java.lang.String)`⁴⁷ method is larger than `DEFAULT_MINIMUM_ELAPSED`⁴⁸ 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 javadocs](#)⁴⁹ 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(r, 0))
% Initialize the reader with an input file to cache the reader
r.setId('/path/to/large_file');
% Close reader
r.close()

% Enter parallel loop
parfor i = 1 : nWorkers
    % Initialize a new reader per worker as Bio-Formats is not thread safe
    r2 = loci.formats.Memoizer(bfGetReader(r, 0))
    % Initialization should use the memo file cached before entering the
    % parallel loop
    r2.setId('/path/to/large_file');

    % Perform work

    % Close the reader
    r2.close()
end
```

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁵⁰ or the previous versions⁵¹ page to find documentation for the version you are using.

⁴⁷[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))

⁴⁸http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html#DEFAULT_MINIMUM_ELAPSED

⁴⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/Memoizer.html>

⁵⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵¹<http://www.openmicroscopy.org/site/support/legacy/>

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 version⁵²](#) or the [previous versions⁵³](#) 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 code⁵⁴](#).

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 version⁵⁵](#) or the [previous versions⁵⁶](#) 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 *jar2lib⁵⁷* 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:

- *showinf⁵⁸*
- *minimum_writer⁵⁹*

Other projects using BF-CPP include:

- *WiscScan⁶⁰* which uses BF-CPP to write **OME-TIFF⁶¹** files.
- *XuvTools* which uses an adapted version of BF-CPP called **BlitzBioFormats⁶²**.

⁵²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵³<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁴<http://loci.wisc.edu/software/interfacing-non-java-code>

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

⁵⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁷<http://loci.wisc.edu/software/jar2lib>

⁵⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/cppwrap/showinf.cpp>

⁵⁹https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/cppwrap/minimum_writer.cpp

⁶⁰<http://loci.wisc.edu/software/wiscscan>

⁶¹<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff>

⁶²<http://www.xuvtools.org/devel:libblitzbioformats>

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 version⁶³](#) or the [previous versions⁶⁴](#) 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 Maven⁶⁵** 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.
- **CMake⁶⁶** 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 Thread⁶⁷** 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 Kit⁶⁸** 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;
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

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

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

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](#)⁶⁹ or [mailing lists](#)⁷⁰.

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.

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](#)⁷³.

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.

Compile-time dependencies – Windows – CMake

Download and run the [CMake installer](#)⁷⁴.

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.

⁶⁹<http://www.openmicroscopy.org/community/>

⁷⁰<http://lists.openmicroscopy.org.uk/mailman/listinfo/>

⁷¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷²<http://www.openmicroscopy.org/site/support/legacy/>

⁷³<http://maven.apache.org/>

⁷⁴<http://cmake.org/>

Compile-time dependencies – Windows – Boost

Download [Boost](http://www.boost.org/users/download/)⁷⁵.

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](http://www.oracle.com/technetwork/java/javase/downloads/)⁷⁶.

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](http://www.microsoft.com/express/)⁷⁷.

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
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.

⁷⁵<http://www.boost.org/users/download/>

⁷⁶<http://www.oracle.com/technetwork/java/javase/downloads/>

⁷⁷<http://www.microsoft.com/express/>

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 version⁷⁸](#) or the [previous versions⁷⁹](#) 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 [Homebrew⁸⁰](#):

```
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 version⁸¹](#) or the [previous versions⁸²](#) page to find documentation for the version you are using.

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
```

⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁸⁰<https://github.com/mxcl/homebrew/>

⁸¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸²<http://www.openmicroscopy.org/site/support/legacy/>


```
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](#) or the [previous versions²](#) 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 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	◦		
Apache Ant§	1.9.x	1.8.x	◦		
Java§	1.7.x	1.6.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 only for building

† 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/~gohlke/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`

- [Website](#)¹⁸
- [Download](#)¹⁹

Doxygen

System	Package
BSD Ports	devel/doxygen
Debian/Ubuntu	doxygen
Homebrew	doxygen
RedHat/CentOS	doxygen

- [Website](#)²⁰
- [Download](#)²¹

Graphviz

If possible, install the following packages:

System	Package
BSD Ports	graphics/graphviz
Debian/Ubuntu	graphviz
Homebrew	graphviz
RedHat/CentOS	graphviz

- [Website](#)²²
- [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

- [Website](#)²⁴
- [Download](#)²⁵

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>

14.1.2 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**.

14.1.3 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

14.1.4 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:

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**.

14.1.5 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).

14.1.6 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
```

14.1.7 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
```

14.1.8 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 versions](#)³⁵ page to find documentation for the version you are using.

³³<http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/annotated.html>

³⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵<http://www.openmicroscopy.org/site/support/legacy/>

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.

```
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

```
//                               Non-constant                               Constant
// -----
// Pointer
                                Image *i;                                const Image *i;
                                Image * const i;                        const Image * const i;

// Reference
                                Image& i;                                const Image& i;

// Shared pointer
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::ostringstream 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.

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

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

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.

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)
    {
        // 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';
    }
}

```

Full example source: `metadata-formatreader.cpp`

See also:

- [CoreMetadata](#)³⁸
- [FormatReader](#)³⁹

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)

```

³⁸http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1CoreMetadata.html

³⁹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatReader.html

```

{
    // 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';
}
}

```

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](#)⁴⁰
- [FormatReader](#)⁴¹
- [OriginalMetadataAnnotation](#)⁴²

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.

⁴⁰http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1MetadataMap.html

⁴¹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatReader.html

⁴²http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1xml_1_1model_1_1OriginalMetadataAnnotation.html

```

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 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. A 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(meta::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
meta::OMEXMLMetadata *omexmlmeta = dynamic_cast<meta::OMEXMLMetadata *>(&meta);
if (omexmlmeta)
    addMetadataOnly(*omexmlmeta, i);
}

```

Full example source: `metadata-io.cpp`

See also:

- Metadata classes⁴³
- createID⁴⁴
- createOMEXMLMetadata⁴⁵
- getOMEXML⁴⁶

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);

```

⁴³http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaceome_1_1xml_1_1meta.html

⁴⁴http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaceome_1_1bioformats.html#ab3bf80ec03bcf20b199ce2761d48fe01

⁴⁵http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaceome_1_1bioformats.html#ae61f12958973765e8328348874a85731

⁴⁶http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaceome_1_1bioformats.html#a32e5424991ce09b857ddc0d5be37c4f1

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](#)⁴⁷
- [OME](#)⁴⁸

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 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](#)⁴⁹ 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](#)⁵⁰:

```
// 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](#)⁵¹. 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

⁴⁷http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaeome_1_1xml_1_1model.html

⁴⁸http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1xml_1_1model_1_1OME.html

⁴⁹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/namespaeome_1_1bioformats.html#ad9ebb405a4815c189fa788325f68a91a

⁵⁰http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1PixelBufferBase.html#a419ad49f2ea90937a57b81a74b56380b

⁵¹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1PixelBufferBase.html#ac7e922610bf561f311d13c3d7fcaeb69

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,
     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";
}
}
}

```

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](#)⁵² 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](#)⁵³
- [PixelBuffer](#)⁵⁴
- [VariantPixelBuffer](#)⁵⁵
- [FormatReader::getLookupTable](#)⁵⁶
- [FormatReader::openBytes](#)⁵⁷
- [FormatWriter::setLookupTable](#)⁵⁸
- [FormatWriter::saveBytes](#)⁵⁹

⁵²<http://en.cppreference.com/w/cpp/language/sfinae>

⁵³http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1xml_1_1model_1_1enums_1_1PixelType.html

⁵⁴http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1PixelBuffer.html

⁵⁵http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1VariantPixelBuffer.html

⁵⁶http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatReader.html#a416742287de02c29d68147e7965316c4

⁵⁷http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatReader.html#a91184deaf16c42b51eb564ee11e76fe2

⁵⁸http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatWriter.html#a7ee8eaab7b440be78f3707d1f34ec372

⁵⁹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatWriter.html#a3f75d001c244c06883c986df988d31b5

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 read a specific image file
4. Retrieve desired metadata and pixel data

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);
```

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](#)⁶⁰
- [TIFFReader](#)⁶¹
- [OMETIFFReader](#)⁶²

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.

⁶⁰http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1FormatReader.html

⁶¹http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1in_1_1TIFFReader.html

⁶²http://downloads.openmicroscopy.org/latest/bio-formats-cpp5.1/api/classome_1_1bioformats_1_1in_1_1OMETIFFReader.html

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

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

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:

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](#)⁶⁵ 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

⁶⁵<http://www.cmake.org/cmake/help/v3.0/module/GNUInstallDirs.html>

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁶⁶](#) or the [previous versions⁶⁷](#) page to find documentation for the version you are using.

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 version⁶⁸](#) or the [previous versions⁶⁹](#) page to find documentation for the version you are using.

14.6 bf-test info

14.6.1 Synopsis

bf-test info [*options*] *file*

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

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

⁶⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁹<http://www.openmicroscopy.org/site/support/legacy/>

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.

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 version⁷⁰](#) or the [previous versions⁷¹](#) 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.

⁷⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷¹<http://www.openmicroscopy.org/site/support/legacy/>

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.

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](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.

15.1 Testing code changes

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](http://www.openmicroscopy.org/site/support/legacy/) 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.

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.

15.2 Public test data

Most of the data-driven tests would benefit from having a comprehensive set of public sample data (see also [#4086⁶](#)).

Formats for which we already have public sample data:

A ‘*’ indicates that we could generate more public data in this format.

- ICS (*)

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

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

⁶<http://trac.openmicroscopy.org.uk/ome/ticket/4086>

- Leica LEI
- IPLab
- BMP (*)
- Image-Pro SEQ
- QuickTime (*)
- Bio-Rad PIC
- Image-Pro Workspace
- Fluoview/ABD TIFF (*)
- Perkin Elmer Ultraview
- Gatan DM3
- Zeiss LSM
- Openlab LIFF (*)
- Leica LIF (*)
- TIFF (*)
- Khoros (<http://netghost.narod.ru/gff/sample/images/viff/index.htm>)
- MNG ([Download⁷](#)) (*)

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)

⁷http://sourceforge.net/projects/libmng/files/libmng-testsuites/Release-20030305/MNGsuite-20030305.zip/download?use_mirror=freefr&download=

- 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)
- 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
- Improvion 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 version⁸](#) or the [previous versions⁹](#) 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.

There are a few other keys that can be added as well:

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

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

Key	Value
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)
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

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.tif
```

If you do not have the command line tools installed, substitute `loci.formats.tools.ImageConverter`¹⁰ for `bfconvert`.

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.

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`¹³ or an existing reader¹⁴.

15.4.1 Methods to override

- `isSingleFile(java.lang.String)`¹⁵ 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)`¹⁶ 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)`¹⁷ 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`: the files cannot be handled separately
 - `FormatTools.CAN_GROUP`: the files may be handled separately or as a single unit
 - `FormatTools.CANNOT_GROUP`: 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)`¹⁸ 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

¹⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-tools/src/loci/formats/tools/ImageConverter.java>

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

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

¹³<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html>

¹⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/in/package-summary.html>

¹⁵[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))

¹⁶[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))

¹⁷[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))

¹⁸[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))

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](#)¹⁹. 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)`²⁰ 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` 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()` and `isInterleaved()`. 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)`²¹ 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' variable (see [loci.formats.CoreMetadata](#)²²).

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" where you should store any relevant metadata.

- `close(boolean)`²³ 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](#)²⁴). In this case, it is usually sufficient to override `initFile(java.lang.String)`²⁵ and `isThisType(byte[])`²⁶.

Every reader also has an instance of [loci.formats.CoreMetadata](#)²⁷. 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](#)²⁸ or [loci.common.Location](#)²⁹, 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\(java.lang.String, java.lang.String\)](#)³⁰ and [loci.common.Location.getMappedId\(java.lang.String\)](#)³¹.

¹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PerkinElmerReader.java>

²⁰[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))

²¹[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))

²²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/CoreMetadata.html>

²³[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))

²⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html>

²⁵[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))

²⁶[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[]))

²⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/CoreMetadata.html>

²⁸<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/RandomAccessInputStream.html>

²⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/Location.html>

³⁰[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))

³¹[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`³² that should be populated in the constructor of any implemented reader.

These variables are:

- `suffixNecessary`³³ Indicates whether or not a file name suffix is required; true by default
- `suffixSufficient`³⁴ Indicates whether or not a specific file name suffix guarantees that this reader can open a particular file; true by default
- `hasCompanionFiles`³⁵ 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`³⁶ A brief description of the layout of files in datasets of this format; only necessary for multi-file datasets
- `domains`³⁷ An array of imaging domains for which this format is used. Domains are defined in `loci.formats.FormatTools`³⁸.

15.4.3 Other useful things

- `loci.common.RandomAccessInputStream`³⁹ 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`⁴⁰ 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](#)⁴¹ for additional information.
- `loci.common.DataTools`⁴² 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`⁴³ 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` package⁴⁴.
- Several common image compression types are supported through subclasses of `loci.formats.codec.BaseCodec`⁴⁵. 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`⁴⁶ 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`⁴⁷, the master file format reader, tries to identify which format reader to use according to the order given in `readers.txt`⁴⁸, 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.

³²<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html>

³³<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#suffixNecessary>

³⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#suffixSufficient>

³⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#hasCompanionFiles>

³⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#datasetDescription>

³⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/FormatReader.html#domains>

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

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

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

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

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

⁴³<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ImageTools.html>

⁴⁴<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/services/package-summary.html>

⁴⁵<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/codec/BaseCodec.html>

⁴⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-api/src/loci/formats/readers.txt>

⁴⁷<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ImageReader.html>

⁴⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-api/src/loci/formats/readers.txt>

`loci.formats.ImageReader`⁴⁹ 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`⁵⁰ 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`⁵¹ 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 [Javadocs](#)⁵². 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`⁵³ (this is the most straightforward one). `loci.formats.in.LIFReader`⁵⁴ and `InCellReader`⁵⁵ 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](#)⁵⁶.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁷ or the [previous versions](#)⁵⁸ page to find documentation for the version you are using.

⁴⁹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/formats/ImageReader.html>

⁵⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/bio-formats-tools/src/loci/formats/tools/ImageInfo.java>

⁵¹<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/tests/testng/FormatReaderTest.html>

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

⁵³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImarisReader.java>

⁵⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LIFReader.java>

⁵⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/InCellReader.java>

⁵⁶<http://www.openmicroscopy.org/site/community>

⁵⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁸<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](#)⁵⁹, [dependency inversion](#)⁶⁰ or [component based design](#)⁶¹.

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](#)⁶² 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](#)⁶³ and [#464](#)⁶⁴.

15.5.2 Writing a service

- **Interface** – The basic form of a service is an interface which inherits from `loci.common.services.Service`⁶⁵. 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);
    }

}
```

⁵⁹http://en.wikipedia.org/wiki/Dependency_injection

⁶⁰http://en.wikipedia.org/wiki/Dependency_inversion_principle

⁶¹http://en.wikipedia.org/wiki/Component-based_software_engineering

⁶²http://en.wikipedia.org/wiki/Dependency_injection

⁶³<http://trac.openmicroscopy.org.uk/ome/ticket/463>

⁶⁴<http://trac.openmicroscopy.org.uk/ome/ticket/464>

⁶⁵<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`⁶⁶ 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.Service`⁶⁷. Source code for `loci.common.services.Service` interface

`loci.common.services.ServiceFactory`⁶⁸ 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](#)⁶⁹ or the [previous versions](#)⁷⁰ 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.

⁶⁶<http://downloads.openmicroscopy.org/latest/bio-formats5.1/api/loci/common/services/ServiceFactory.html>

⁶⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁰<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:

-d, --dry-run	Do not create output files
--debug	Enable xsd-fu and template debugging
-l, --language=lang	Generated language
--metadata-package=pkg	Metadata package
--ome-xml-metadata-package=pkg	OME-XML metadata class package
--ome-xml-model-package=pkg	OME-XML model package
--ome-xml-model-enums-package=pkg	OME-XML model enum package
--ome-xml-model-enum-handlers-package=pkg	OME-XML model enum handler package
-o, --output-directory=dir	Generated output directory
-q, --quiet	Do not output file names
-t, --template-path=path	Genshi template path
-v, --verbose	Output generated file names
-n, --xsd-namespace	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](https://github.com/openmicroscopy/bioformats/blob/develop/components/xsd-fu/cfg/enum_handler.cfg)⁷¹.

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.

⁷¹https://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/)⁷² for his fabulous work on [generateDS](http://www.davekuhlman.org/generateDS.html)⁷³ 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/)⁷⁴ or the [previous versions](http://www.openmicroscopy.org/site/support/legacy/)⁷⁵ 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)⁷⁶ 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)⁷⁷.

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/)⁷⁸ or the [previous](http://www.openmicroscopy.org/site/support/legacy/)

⁷²<http://www.davekuhlman.org/>

⁷³<http://www.davekuhlman.org/generateDS.html>

⁷⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁶<https://trac.openmicroscopy.org.uk/ome/report/44>

⁷⁷<http://www.openmicroscopy.org/site/support/contributing/index.html>

versions⁷⁹ page to find documentation for the version you are using.

⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁹<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](#)⁸⁰. If you have any questions, or would prefer not to use QA, please email the [ome-users mailing list](#)⁸¹. 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](#)⁸² or the [previous versions](#)⁸³ page to find documentation for the version you are using.

⁸⁰<http://qa.openmicroscopy.org.uk/qa/upload/>

⁸¹<http://www.openmicroscopy.org/site/community/mailing-lists>

⁸²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸³<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 lse.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
JPk 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
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

Continued on next page

Table 16.1 – continued from previous page

Format name	File to choose	Structure of files
Micro-Manager	.tif, .tiff, .txt, .xml	A 'metadata.txt' file plus 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
TiIIVision	.vws, .pst, .inf	One .vws file and possibly one similarly-named directory
TopoMetrix	.tfr, .ffr, .zfr, .zfp, .2fl	Single file
Trestle	.tif	One .tif file plus several other similarly-named files (e.g. <i>FocalPlane</i> -, .sld, .slx, .ROI)
Truevision Targa	.tga	Single file
UBM	.pr3	Single file
Unisoku STM	.hdr, .dat	One .HDR file plus one similarly-named .DAT file

Continued on next page

Table 16.1 – continued from previous page

Format name	File to choose	Structure of files
VG SAM	.dti	Single file
Varian FDF	.fdf	Single file
Visitech XYS	.xys, .html	One .html file plus one or more .xys files
Velocity Library	.mvd2, .aisf, .aiix, .dat, .atsf	One .mvd2 file plus a ‘Data’ directory
Velocity 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	.dzi	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\\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>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>		■	▲	▼	■	▼	✖	✖
<i>Burleigh</i>	.img	■	▼	▼	▼	▼	✖	✖
<i>Canon DNG</i>	.cr2, .crw	■	■	▼	▼	▼	✖	✖

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Table 17.1 – continued from previous page

Format	Extensions	Pixels	Metadata	Openness	Presence	Utility	Export	BSD
<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 Aquacosmos 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	▲	■	▲	■	▼	✗	✗
<i>Improvision Openlab Raw</i>	.raw	▲	▲	▲	▼	▼	✗	✗
<i>Improvision TIFF</i>	.tif	▲	▲	▲	▼	■	✗	✗
<i>Inspector OBF</i>	.obf, .msr	▲	■	▲	▼	▼	✗	✓

Continued on next page

Table 17.1 – continued from previous page

Format	Extensions	Pixels	Metadata	Openness	Presence	Utility	Export	BSD
<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>	.jpk	■	▼	▼	▼	▼	✗	✗
<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 Inspector</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	▲	■	▼	▼	▼	✗	✗
<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	▲	▲	▼	▼	▼	✗	✗

Continued on next page

Table 17.1 – continued from previous page

Format	Extensions	Pixels	Metadata	Openness	Presence	Utility	Export	BSD
<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 Paintbrush)</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	▲	▲	▲	▲	▲	✗	✗
<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	▲	▲	▲	▲	▲	✗	✗

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>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							
<i>Zeiss AxioVision TIFF</i>	.xml, .tiff							
<i>Zeiss AxioVision ZVI (Zeiss Vision Image)</i>	.zvi							
<i>Zeiss CZI</i>	.czi ³							
<i>Zeiss LSM (Laser Scanning Microscope) 510/710</i>	.lsm, .mdb							

Bio-Formats currently supports **142** formats³<http://www.zeiss.com/czi>

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

Developer: [Intelligent Imaging Innovations⁶](#)

Owner: [Intelligent Imaging Innovations⁷](#)

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)

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

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

⁶<http://www.intelligent-imaging.com/>

⁷<http://www.intelligent-imaging.com/>

RatingsPixels: 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 Andor Bio-Imaging Division (ABD) TIFF

Extensions: .tif

Developer: Andor Bioimaging Department

Owner: [Andor Technology](#)¹²**Support**BSD-licensed: Export: 


Officially Supported Versions:


Supported Metadata Fields: *Andor Bio-Imaging Division (ABD) TIFF*

We currently have:

- an ABD-TIFF specification document (from 2005 November, in PDF)
- a few ABD-TIFF datasets

We would like to have:

RatingsPixels: Metadata: Openness: Presence: 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.andor.com/>

Utility: 

Additional Information

Source Code: [FluoviewReader.java](#)¹³

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](#)¹⁴ or the [previous versions](#)¹⁵ page to find documentation for the version you are using.

17.3 AIM

Extensions: .aim

Developer: [SCANCO Medical AG](#)¹⁶

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: 

Utility: 

Additional Information

Source Code: [AIMReader.java](#)¹⁷

Notes:

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<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FluoviewReader.java>

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

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

¹⁶<http://www.scanco.ch>

¹⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/AIMReader.java>

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

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

17.4 Alicona 3D

Extensions: .al3d

Owner: [Alicona Imaging](#)²⁰

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions: 1.0

Supported Metadata Fields: *Alicona 3D*

We currently have:

- an [AL3D specification document](#)²¹ (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](#)²²

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](#)²³ or the [previous versions](#)²⁴ page to find documentation for the version you are using.

17.5 Amersham Biosciences Gel

Extensions: .gel

Developer: Molecular Dynamics

Owner: [GE Healthcare Life Sciences](#)²⁵

Support

BSD-licensed: ❌

²⁰<http://www.alicon.com/>

²¹<http://www.alicon.com/home/fileadmin/alicon/download/AL3DFormat.pdf>

²²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/AliconaReader.java>

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

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

²⁵<http://www.gelifesciences.com/>

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](#)²⁶

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](#)²⁷


Note: This documentation is for the new **Bio-Formats 5.1 version**. See the [latest Bio-Formats 5.0.x version](#)²⁸ or the [previous versions](#)²⁹ page to find documentation for the version you are using.

17.6 Amira Mesh

Extensions: .am, .amiramesh, .grey, .hx, .labels

Developer: [Visage Imaging](#)³⁰

Support

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






²⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/GelReader.java>

²⁷<http://www.awaresystems.be/imaging/tiff/tifftags/docs/gel.html>

²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁹<http://www.openmicroscopy.org/site/support/legacy/>

³⁰<http://www.amiravis.com/>


RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [AmiraReader.java](#)³¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³² or the [previous versions](#)³³ page to find documentation for the version you are using.

17.7 Amnis FlowSight

Extensions: .cif

Owner: [Amnis](#)³⁴**Support**BSD-licensed: Export: 




Officially Supported Versions:

Supported Metadata Fields: *Amnis FlowSight*

We currently have:

- a few sample datasets

We would like to have:

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [FlowSightReader.java](#)³⁵

Notes:

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.

³¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/AmiraReader.java>

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

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

³⁴<http://www.amnis.com/>

³⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/FlowSightReader.java>

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


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

17.8 Analyze 7.5

Extensions: .img, .hdr

Developer: Mayo Foundation Biomedical Imaging Resource³⁸

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *Analyze 7.5*

We currently have:


- an *Analyze 7.5* specification document³⁹
- several *Analyze 7.5* datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: *AnalyzeReader.java*⁴⁰

Notes:


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.

17.9 Animated PNG

Extensions: .png

Developer: The Animated PNG Project⁴³

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Animated PNG*

³⁸<http://www.mayo.edu/bir>

³⁹<http://web.archive.org/web/20070927191351/http://www.mayo.edu/bir/PDF/ANALYZE75.pdf>

⁴⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/AnalyzeReader.java>

⁴¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴²<http://www.openmicroscopy.org/site/support/legacy/>

⁴³<http://www.animatedpng.com/>

Freely Available Software:


- Firefox 3+⁴⁴
- Opera 9.5+⁴⁵
- KSquirrel⁴⁶

We currently have:

- a specification document⁴⁷
- several APNG files


We would like to have:

Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [APNGReader.java](#)⁴⁸

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁹ or the [previous versions](#)⁵⁰ page to find documentation for the version you are using.

17.10 Aperio AFI

Extensions: .afi, .svs

Owner: [Aperio](#)⁵¹

Support

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: 

⁴⁴<http://www.mozilla.com/firefox>

⁴⁵<http://www.opera.com/download>

⁴⁶<http://ksquirrel.sourceforge.net/download.php>




⁴⁷http://wiki.mozilla.org/APNG_Specification

⁴⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/APNGReader.java>

⁴⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁵¹<http://www.aperio.com/>

Openness: Presence: Utility: **Additional Information**Source Code: [AFIReader.java](#)⁵²


Notes:

See also:[Aperio ImageScope](#)⁵³

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁴ or the [previous versions](#)⁵⁵ page to find documentation for the version you are using.

17.11 Aperio SVS TIFF

Extensions: .svs

Owner: [Aperio](#)⁵⁶**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

We would like to have:

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [SVSReader.java](#)⁵⁷

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.**See also:**⁵²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/AFIReader.java>⁵³<http://www.leicabiosystems.com/index.php?id=8991>⁵⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁵⁵<http://www.openmicroscopy.org/site/support/legacy/>⁵⁶<http://www.aperio.com/>⁵⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SVSReader.java>

Aperio ImageScope⁵⁸


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁵⁹](#) or the [previous versions⁶⁰](#) page to find documentation for the version you are using.

17.12 Applied Precision CellWorX

Extensions: .htd, .pnl

Developer: [Applied Precision⁶¹](#)

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: 

Additional Information

Source Code: [CellWorxReader.java⁶²](#)

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁶³](#) or the [previous versions⁶⁴](#) page to find documentation for the version you are using.

17.13 AVI (Audio Video Interleave)

Extensions: .avi

Developer: [Microsoft⁶⁵](#)

Support

⁵⁸<http://www.leicabiosystems.com/index.php?id=8991>

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

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


⁶¹<http://www.api.com>

⁶²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/CellWorxReader.java>

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

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

⁶⁵<http://www.microsoft.com/>

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *AVI (Audio Video Interleave)*

Freely Available Software:

- [AVI Reader plugin for ImageJ](#)⁶⁶
- [AVI Writer plugin for ImageJ](#)⁶⁷


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](#)⁶⁸

Notes:

- Bio-Formats can save image stacks as AVI (uncompressed).
- The following codecs are supported for reading:
 - Microsoft Run-Length Encoding (MSRLE)
 - Microsoft Video (MSV1)
 - Raw (uncompressed)
 - JPEG

See also:

[AVI RIFF File Reference](#)⁶⁹ [AVI on Wikipedia](#)⁷⁰

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.

⁶⁶<http://rsb.info.nih.gov/ij/plugins/avi-reader.html>

⁶⁷<http://rsb.info.nih.gov/ij/plugins/avi.html>

⁶⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/AVIReader.java>

⁶⁹<http://msdn2.microsoft.com/en-us/library/ms779636.aspx>

⁷⁰http://en.wikipedia.org/wiki/Audio_Video_Interleave

⁷¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷²<http://www.openmicroscopy.org/site/support/legacy/>

17.14 Axon Raw Format

Extensions: .arf

Owner: INDEC BioSystems⁷³

Support

BSD-licensed: ✖

Export: ✖

Officially Supported Versions:

Supported Metadata Fields: *Axon Raw Format*

We currently have:

- one ARF dataset
- a [specification document](#)⁷⁴

We would like to have:

- more ARF datasets

Ratings

Pixels: ▲

Metadata: ▼

Openness: ▲

Presence: ▼

Utility: ▼

Additional Information

Source Code: [ARFReader.java](#)⁷⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁶ or the [previous versions](#)⁷⁷ page to find documentation for the version you are using.

17.15 BD Pathway

Extensions: .exp, .tif

Owner: BD Biosciences⁷⁸

Support

BSD-licensed: ✖

Export: ✖

Officially Supported Versions:

Supported Metadata Fields: *BD Pathway*

We currently have:

⁷³<http://www.indecbiosystems.com/>

⁷⁴http://www.indecbiosystems.com/imagingworkbench/ApplicationNotes/IWAppNote11-ARF_File_Format.pdf

⁷⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ARFReader.java>

⁷⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁷<http://www.openmicroscopy.org/site/support/legacy/>


⁷⁸<http://www.bdbiosciences.com>

- 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](#)⁷⁹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁸⁰ or the [previous versions](#)⁸¹ page to find documentation for the version you are using.

17.16 Becker & Hickl SPCImage

Extensions: .sdt

Owner: [Becker-Hickl](#)⁸²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *Becker & Hickl SPCImage*

We currently have:

- an SDT specification document (from 2008 April, in PDF)
- an SDT specification document (from 2006 June, in PDF)
- Becker & Hickl's *SPCImage*⁸³ software
- a large number of SDT datasets
- the ability to produce new datasets

We would like to have:

Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 


⁷⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BDReader.java>

⁸⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸¹<http://www.openmicroscopy.org/site/support/legacy/>

⁸²<http://www.becker-hickl.de/>

⁸³<http://www.becker-hickl.de/software/tcspc/softwaretcspcspecial.htm>

Utility: 

Additional Information

Source Code: [SDTReader.java](#)⁸⁴

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](#)⁸⁵ or the [previous versions](#)⁸⁶ page to find documentation for the version you are using.

17.17 Bio-Rad Gel

Extensions: .lsc

Owner: [Bio-Rad](#)⁸⁷

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


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [BioRadGelReader.java](#)⁸⁸

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁸⁹ or the [previous versions](#)⁹⁰ page to find documentation for the version you are using.

⁸⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SDTReader.java>

⁸⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁸⁷<http://www.bio-rad.com>

⁸⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BioRadGelReader.java>

⁸⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹⁰<http://www.openmicroscopy.org/site/support/legacy/>


17.18 Bio-Rad PIC

Extensions: .pic, .raw, .xml

Developer: Bio-Rad

Owner: Carl Zeiss, Inc.⁹¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Bio-Rad PIC*

Freely Available Software:


- Bio-Rad PIC reader plugin for ImageJ⁹²


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:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [BioRadReader.java](#)⁹³

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 Imaris⁹⁴
 - SVI Huygens⁹⁵

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.

⁹¹<http://www.zeiss.com/>

⁹²<http://rsb.info.nih.gov/ij/plugins/biorad.html>

⁹³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BioRadReader.java>

⁹⁴<http://www.bitplane.com/>

⁹⁵<http://svi.nl/>

⁹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹⁷<http://www.openmicroscopy.org/site/support/legacy/>


17.19 Bio-Rad SCN

Extensions: .scn

Developer: Bio-Rad

Owner: [Bio-Rad](#)⁹⁸

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](#)⁹⁹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁰⁰ or the [previous versions](#)¹⁰¹ page to find documentation for the version you are using.

17.20 Bitplane Imaris

Extensions: .ims

Owner: [Bitplane](#)¹⁰²

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 document¹⁰³ (from no later than 1997 November 11, in HTML)

⁹⁸<http://www.bio-rad.com>

⁹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BioRadSCNReader.java>

¹⁰⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰¹<http://www.openmicroscopy.org/site/support/legacy/>

¹⁰²<http://www.bitplane.com/>


¹⁰³<http://flash.bitplane.com/wda/interfaces/public/faqs/faqsview.cfm?inCat=0&inQuestionID=104>


- 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](#)¹⁰⁴, [ImarisTiffReader.java](#)¹⁰⁵, [ImarisReader.java](#)¹⁰⁶

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](#)¹⁰⁷ or the [previous versions](#)¹⁰⁸ page to find documentation for the version you are using.

17.21 Bruker MRI

Developer: [Bruker](#)¹⁰⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *[Bruker MRI](#)*

Freely Available Software:

- [Bruker plugin for ImageJ](#)¹¹⁰

We currently have:

¹⁰⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImarisHDFReader.java>

¹⁰⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImarisTiffReader.java>

¹⁰⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImarisReader.java>

¹⁰⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁰⁹<http://www.bruker.com/>


¹¹⁰<http://rsbweb.nih.gov/ij/plugins/bruker.html>


- 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](#)¹¹¹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹¹² or the [previous versions](#)¹¹³ page to find documentation for the version you are using.

17.22 Burleigh

Extensions: .img

Owner: Burleigh Instruments

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Burleigh*

We currently have:

- 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

¹¹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BrukerReader.java>

¹¹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹³<http://www.openmicroscopy.org/site/support/legacy/>

Source Code: [BurleighReader.java](#)¹¹⁴

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹¹⁵ or the [previous versions](#)¹¹⁶ page to find documentation for the version you are using.

17.23 Canon DNG

Extensions: .cr2, .crw

Developer: [Canon](#)¹¹⁷

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Canon DNG*

Freely Available Software:

- [IrfanView](#)¹¹⁸


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: [DNGReader.java](#)¹¹⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹²⁰ or the [previous versions](#)¹²¹ page to find documentation for the version you are using.

¹¹⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/BurleighReader.java>

¹¹⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹⁶<http://www.openmicroscopy.org/site/support/legacy/>

¹¹⁷<http://canon.com>

¹¹⁸<http://www.irfanview.com/>

¹¹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/DNGReader.java>

¹²⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


¹²¹<http://www.openmicroscopy.org/site/support/legacy/>

17.24 CellH5

Extensions: .ch5

Developer: [CellH5](#)¹²²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *CellH5*

Freely Available Software:


- [CellH5](#)¹²³

We currently have:

- a few CellH5 datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [CellH5Reader.java](#)¹²⁴

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹²⁵ or the [previous versions](#)¹²⁶ page to find documentation for the version you are using.

17.25 Cellomics

Extensions: .c01

Developer: [Thermo Fisher Scientific](#)¹²⁷

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Cellomics*

We currently have:

¹²²<http://cellh5.org/>

¹²³<http://cellh5.org/>

¹²⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/CellH5Reader.java>

¹²⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹²⁶<http://www.openmicroscopy.org/site/support/legacy/>

¹²⁷<http://www.thermofisher.com/>

- 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](#)¹²⁸

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹²⁹ or the [previous versions](#)¹³⁰ page to find documentation for the version you are using.

17.26 cellSens VSI

Extensions: .vsi

Developer: [Olympus](#)¹³¹

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: *cellSens VSI*

We currently have:

- a few example datasets

We would like to have:

- an official specification document

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

¹²⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/CellomicsReader.java>

¹²⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³⁰<http://www.openmicroscopy.org/site/support/legacy/>

¹³¹<http://www.olympus.com/>

Source Code: [CellSensReader.java](#)¹³²

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹³³ or the [previous versions](#)¹³⁴ page to find documentation for the version you are using.

17.27 CellVoyager

Extensions: .xml, .tif

Owner: [Yokogawa](#)¹³⁵

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](#)¹³⁶

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹³⁷ or the [previous versions](#)¹³⁸ page to find documentation for the version you are using.

17.28 DeltaVision

Extensions: .dv, .r3d

Owner: [GE Healthcare \(formerly Applied Precision\)](#)¹³⁹

Support

¹³²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/CellSensReader.java>

¹³³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³⁴<http://www.openmicroscopy.org/site/support/legacy/>


¹³⁵<http://www.yokogawa.com/>

¹³⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/CellVoyagerReader.java>

¹³⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹³⁹<http://www.gelifesciences.com/webapp/wcs/stores/servlet/catalog/en/GELifeSciences-UK/brands/deltavision/>

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *DeltaVision*

Freely Available Software:


- *DeltaVision Opener plugin for ImageJ*¹⁴⁰


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.java*¹⁴¹

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 Imaris*¹⁴²
 - *SVI Huygens*¹⁴³
 - *Image-Pro Plus*¹⁴⁴

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁴⁵ or the [previous versions](#)¹⁴⁶ page to find documentation for the version you are using.

17.29 DICOM

Extensions: .dcm, .dicom

Developer: *National Electrical Manufacturers Association*¹⁴⁷

Support

BSD-licensed: 

Export: 

¹⁴⁰<http://rsb.info.nih.gov/ij/plugins/track/delta.html>

¹⁴¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/DeltavisionReader.java>

¹⁴²<http://www.bitplane.com/>

¹⁴³<http://svi.nl/>

¹⁴⁴<http://www.mediacy.com/>

¹⁴⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁴⁶<http://www.openmicroscopy.org/site/support/legacy/>

¹⁴⁷<http://www.nema.org/>

Officially Supported Versions:

Supported Metadata Fields: *DICOM*

Freely Available Software:

- [OsiriX Medical Imaging Software](#)¹⁴⁸
- [ezDICOM](#)¹⁴⁹
- [Wikipedia's list of freeware health software](#)¹⁵⁰

Sample Datasets:


- [MRI Chest from FreeVol-3D web site](#)¹⁵¹
- [Medical Image Samples from Sebastien Barre's Medical Imaging page](#)¹⁵²
- [DICOM sample image sets from OsiriX web site](#)¹⁵³

We currently have:

- [DICOM specification documents](#)¹⁵⁴ (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](#)¹⁵⁵

Notes:

- 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](#)¹⁵⁶

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁵⁷ or the [previous versions](#)¹⁵⁸ page to find documentation for the version you are using.

¹⁴⁸<http://www.osirix-viewer.com/>

¹⁴⁹<http://www.sph.sc.edu/comd/rorden/ezdicom.html>

¹⁵⁰http://en.wikipedia.org/wiki/List_of_freeware_health_software#Imaging.2FVisualization

¹⁵¹http://members.tripod.com/%7Eclunis_immensus/free3d/hk-40.zip

¹⁵²<http://www.barre.nom.fr/medical/samples/>

¹⁵³<http://osirix-viewer.com/datasets/>

¹⁵⁴<http://medical.nema.org/dicom/2007/>

¹⁵⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/DicomReader.java>

¹⁵⁶<http://medical.nema.org/>

¹⁵⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


¹⁵⁸<http://www.openmicroscopy.org/site/support/legacy/>

17.30 ECAT7

Extensions: .v

Developer: [Siemens](#)¹⁵⁹

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](#)¹⁶⁰

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁶¹ or the [previous versions](#)¹⁶² page to find documentation for the version you are using.

17.31 EPS (Encapsulated PostScript)

Extensions: .eps, .epsi, .ps

Developer: [Adobe](#)¹⁶³

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *EPS (Encapsulated PostScript)*

Freely Available Software:

¹⁵⁹<http://www.siemens.com>

¹⁶⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/Ecat7Reader.java>

¹⁶¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁶²<http://www.openmicroscopy.org/site/support/legacy/>

¹⁶³<http://www.adobe.com/>


- EPS Writer plugin for ImageJ¹⁶⁴

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](#)¹⁶⁵ Source Code: [EPSWriter.java](#)¹⁶⁶

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](#)¹⁶⁷ or the [previous versions](#)¹⁶⁸ page to find documentation for the version you are using.

17.32 Evotec/PerkinElmer Opera Flex

Extensions: .flex, .mea, .res

Developer: [Evotec Technologies, now PerkinElmer](#)¹⁶⁹

Support

BSD-licensed: 

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: 

¹⁶⁴<http://rsb.info.nih.gov/ij/plugins/eps-writer.html>


¹⁶⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/EPSReader.java>


¹⁶⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/EPSWriter.java>

¹⁶⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁶⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁶⁹<http://www.perkinelmer.com/>

Presence: 

Utility: 

Additional Information

Source Code: [FlexReader.java](#)¹⁷⁰

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)¹⁷¹


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁷² or the [previous versions](#)¹⁷³ page to find documentation for the version you are using.

17.33 FEI

Extensions: .img

Developer: [FEI](#)¹⁷⁴

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


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [FEIReader.java](#)¹⁷⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁷⁶ or the [previous](#)

¹⁷⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FlexReader.java>

¹⁷¹<http://www.luratech.com/>

¹⁷²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁷³<http://www.openmicroscopy.org/site/support/legacy/>

¹⁷⁴<http://www.fei.com/>

¹⁷⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FEIReader.java>


[versions](#)¹⁷⁷ page to find documentation for the version you are using.

17.34 FEI TIFF

Extensions: .tiff

Developer: [FEI](#)¹⁷⁸

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:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [FEITiffReader.java](#)¹⁷⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁸⁰ or the [previous versions](#)¹⁸¹ page to find documentation for the version you are using.

17.35 FITS (Flexible Image Transport System)

Extensions: .fits

Developer: [National Radio Astronomy Observatory](#)¹⁸²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *FITS (Flexible Image Transport System)*

¹⁷⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁷⁷<http://www.openmicroscopy.org/site/support/legacy/>

¹⁷⁸<http://www.fei.com>

¹⁷⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FEITiffReader.java>

¹⁸⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁸¹<http://www.openmicroscopy.org/site/support/legacy/>

¹⁸²<http://www.nrao.edu/>

We currently have:

- a [FITS specification document](#)¹⁸³ (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](#)¹⁸⁴

Notes:

See also:

[MAST:FITS homepage](#)¹⁸⁵ [FITS Support Office](#)¹⁸⁶

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.

17.36 Gatan Digital Micrograph

Extensions: .dm3

Owner: [Gatan](#)¹⁸⁹

Support

BSD-licensed:

Export:

Officially Supported Versions: 3

Supported Metadata Fields: *Gatan Digital Micrograph*

Freely Available Software:

- [DM3 Reader plugin for ImageJ](#)¹⁹⁰
- [EMAN](#)¹⁹¹

We currently have:

- Gatan's ImageReader2003 code (from 2003, in C++)
- numerous DM3 datasets

We would like to have:

¹⁸³http://archive.stsci.edu/fits/fits_standard/

¹⁸⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/FitsReader.java>

¹⁸⁵<http://archive.stsci.edu/fits/>

¹⁸⁶<http://fits.gsfc.nasa.gov/>

¹⁸⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁸⁸<http://www.openmicroscopy.org/site/support/legacy/>


¹⁸⁹<http://www.gatan.com/>

¹⁹⁰http://rsb.info.nih.gov/ij/plugins/DM3_Reader.html


¹⁹¹<http://blake.bcm.edu/EMAN/>


- a DM3 specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [GatanReader.java](#)¹⁹²

Notes:

Commercial applications that support .dm3 files include [Datasqueeze](#)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 2

Extensions: .dm2

Developer: [Gatan](#)¹⁹⁶

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)
- 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

¹⁹²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/GatanReader.java>

¹⁹³<http://www.datasqueezesoftware.com/>

¹⁹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹⁹⁶<http://www.gatan.com>

Source Code: [GatanDM2Reader.java](#)¹⁹⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)¹⁹⁸ or the [previous versions](#)¹⁹⁹ page to find documentation for the version you are using.


17.38 GIF (Graphics Interchange Format)

Extensions: .gif

Developer: [CompuServe](#)²⁰⁰

Owner: [Unisys](#)²⁰¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *GIF (Graphics Interchange Format)*

Freely Available Software:


- [Animated GIF Reader plugin for ImageJ](#)²⁰²
- [GIF Stack Writer plugin for ImageJ](#)²⁰³

We currently have:

- [a GIF specification document](#)²⁰⁴ (Version 89a, from 1990, in HTML)
- numerous GIF datasets
- the ability to produce new datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [GIFReader.java](#)²⁰⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁰⁶ or the [previous](#)

¹⁹⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/GatanDM2Reader.java>

¹⁹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹⁹<http://www.openmicroscopy.org/site/support/legacy/>

²⁰⁰<http://www.compuServe.com/>

²⁰¹<http://www.unisys.com/>

²⁰²<http://rsb.info.nih.gov/ij/plugins/agr.html>

²⁰³<http://rsb.info.nih.gov/ij/plugins/gif-stack-writer.html>

²⁰⁴<http://tronche.com/computer-graphics/gif/>

²⁰⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/GIFReader.java>

[versions](#)²⁰⁷ page to find documentation for the version you are using.

17.39 Hamamatsu Aquacosmos NAF

Extensions: .naf

Developer: [Hamamatsu](#)²⁰⁸

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](#)²⁰⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²¹⁰ or the [previous versions](#)²¹¹ page to find documentation for the version you are using.

17.40 Hamamatsu HIS

Extensions: .his

Owner: [Hamamatsu](#)²¹²

Support

BSD-licensed: ✖

Export: ✖

²⁰⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁰⁷<http://www.openmicroscopy.org/site/support/legacy/>

²⁰⁸<http://www.hamamatsu.com/>

²⁰⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NAFReader.java>

²¹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²¹¹<http://www.openmicroscopy.org/site/support/legacy/>

²¹²<http://www.hamamatsu.com>

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.java](#)²¹³

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²¹⁴ or the [previous versions](#)²¹⁵ page to find documentation for the version you are using.

17.41 Hamamatsu ndpi

Extensions: .ndpi

Developer: [Hamamatsu](#)²¹⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Hamamatsu ndpi*

Freely Available Software:

- [NDP.view](#)²¹⁷

Sample Datasets:

- [OpenSlide](#)²¹⁸

We currently have:

- many example datasets

We would like to have:

²¹³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/HISReader.java>

²¹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²¹⁵<http://www.openmicroscopy.org/site/support/legacy/>


²¹⁶<http://www.hamamatsu.com>

²¹⁷http://www.olympusamerica.com/seg_section/seg_vm_downloads.asp


²¹⁸<http://openslide.cs.cmu.edu/download/openslide-testdata/Hamamatsu/>


- an official specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [NDPIReader.java](#)²¹⁹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²²⁰ or the [previous versions](#)²²¹ page to find documentation for the version you are using.

17.42 Hamamatsu VMS

Extensions: .vms

Developer: [Hamamatsu](#)²²²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: [Hamamatsu VMS](#)

Sample Datasets:

- [OpenSlide](#)²²³


We currently have:

- a few example datasets
- [developer documentation from the OpenSlide project](#)²²⁴

We would like to have:

- an official specification document
- more example datasets

Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

²¹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NDPIReader.java>


²²⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²²¹<http://www.openmicroscopy.org/site/support/legacy/>

²²²<http://www.hamamatsu.com>

²²³<http://openslide.cs.cmu.edu/download/openslide-testdata/Hamamatsu-vms/>

²²⁴<http://openslide.org/Hamamatsu%20format/>

Utility: 

Additional Information

Source Code: [HamamatsuVMSReader.java](#)²²⁵

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²²⁶ or the [previous versions](#)²²⁷ page to find documentation for the version you are using.

17.43 Hitachi S-4800

Extensions: .txt, .tif, .bmp, .jpg

Developer: [Hitachi](#)²²⁸

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: 

Additional Information

Source Code: [HitachiReader.java](#)²²⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²³⁰ or the [previous versions](#)²³¹ page to find documentation for the version you are using.

17.44 I2I

Extensions: .i2i

Developer: [Biomedical Imaging Group, UMass Medical School](#)²³²

²²⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/HamamatsuVMSReader.java>

²²⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²²⁷<http://www.openmicroscopy.org/site/support/legacy/>

²²⁸http://www.hitachi-hita.com/sites/default/files/technotes/Hitachi_4800_STEM.pdf

²²⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/HitachiReader.java>

²³⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²³¹<http://www.openmicroscopy.org/site/support/legacy/>

²³²<http://invitro.umassmed.edu/>

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](#)²³³

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²³⁴ or the previous versions²³⁵ page to find documentation for the version you are using.

17.45 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)²³⁶
- ICS Opener plugin for ImageJ²³⁷
- IrfanView²³⁸

We currently have:

²³³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/I2IReader.java>

²³⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²³⁵<http://www.openmicroscopy.org/site/support/legacy/>

²³⁶<http://libics.sourceforge.net/>


²³⁷http://valelab.ucsf.edu/%7Enstuurman/IJplugins/Ics_Opener.html


²³⁸<http://www.irfanview.com/>


- numerous ICS datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [ICSReader.java](#)²³⁹ Source Code: [ICSWriter.java](#)²⁴⁰

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](#)²⁴¹
- [SVI Huygens](#)²⁴²


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁴³ or the [previous versions](#)²⁴⁴ page to find documentation for the version you are using.

17.46 Imacon

Extensions: .fff

Owner: [Hasselblad](#)²⁴⁵

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: 

²³⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/ICSReader.java>

²⁴⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/ICSWriter.java>



²⁴¹<http://www.bitplane.com/>

²⁴²<http://svi.nl/>

²⁴³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴⁴<http://www.openmicroscopy.org/site/support/legacy/>

²⁴⁵<http://www.hasselbladusa.com/>

Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [ImaconReader.java](#)²⁴⁶

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁴⁷ or the [previous versions](#)²⁴⁸ page to find documentation for the version you are using.

17.47 ImagePro Sequence

Extensions: .seq

Owner: [Media Cybernetics](#)²⁴⁹**Support**BSD-licensed: Export: 

Officially Supported Versions:



Supported Metadata Fields: *ImagePro Sequence*

We currently have:

- the [Image-Pro Plus](#)²⁵⁰ software
- a few SEQ datasets
- the ability to produce more datasets

We would like to have:

- an official SEQ specification document

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [SEQReader.java](#)²⁵¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁵² or the [previous](#)

²⁴⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImaconReader.java>²⁴⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>²⁴⁸<http://www.openmicroscopy.org/site/support/legacy/>²⁴⁹<http://www.mediacy.com/>²⁵⁰<http://www.mediacy.com/index.aspx?page=IPP>²⁵¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SEQReader.java>

[versions](#)²⁵³ page to find documentation for the version you are using.

17.48 ImagePro Workspace

Extensions: .ipw

Owner: [Media Cybernetics](#)²⁵⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *ImagePro Workspace*


We currently have:

- the [Image-Pro Plus](#)²⁵⁵ 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


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [IPWReader.java](#)²⁵⁶

Notes:

Bio-Formats uses a modified version of the [Apache Jakarta POI](#)²⁵⁷ 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](#)²⁵⁸ or the [previous versions](#)²⁵⁹ page to find documentation for the version you are using.

²⁵²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁵³<http://www.openmicroscopy.org/site/support/legacy/>

²⁵⁴<http://www.mediacy.com/>

²⁵⁵<http://www.mediacy.com/index.aspx?page=IPP>

²⁵⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/IPWReader.java>

²⁵⁷<http://jakarta.apache.org/poi/>

²⁵⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


²⁵⁹<http://www.openmicroscopy.org/site/support/legacy/>

17.49 IMAGIC

Extensions: .hed, .img

Developer: [Image Science](#)²⁶⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *IMAGIC*

Freely Available Software:

- [em2em](#)²⁶¹


We currently have:

- one example dataset
- official file format documentation

We would like to have:


- more example datasets


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [ImagicReader.java](#)²⁶²

Notes:

See also:

[IMAGIC specification](#)²⁶³

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁶⁴ or the [previous versions](#)²⁶⁵ page to find documentation for the version you are using.

17.50 IMOD

Extensions: .mod

Developer: [Boulder Laboratory for 3-Dimensional Electron Microscopy of Cells](#)²⁶⁶

Owner: [Boulder Laboratory for 3-Dimensional Electron Microscopy of Cells](#)²⁶⁷

²⁶⁰<http://www.imagescience.de>

²⁶¹<http://www.imagescience.de/em2em.html>

²⁶²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImagicReader.java>

²⁶³<http://www.imagescience.de/em2em.html>

²⁶⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁶⁵<http://www.openmicroscopy.org/site/support/legacy/>

²⁶⁶<http://bio3d.colorado.edu>

²⁶⁷<http://bio3d.colorado.edu>

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *IMOD*

Freely Available Software:

- *IMOD*²⁶⁸

We currently have:

- a few sample datasets
- *official documentation*²⁶⁹

We would like to have:

Ratings

Pixels: 🟡

Metadata: 🟡

Openness: 🟢

Presence: 🟠

Utility: 🟠

Additional Information

Source Code: *IMODReader.java*²⁷⁰

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version²⁷¹ or the previous versions²⁷² page to find documentation for the version you are using.

17.51 Improvise Openlab LIFF

Extensions: .liff

Developer: *Improvise*²⁷³

Owner: *PerkinElmer*²⁷⁴

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)

²⁶⁸<http://bio3d.colorado.edu/imod/>

²⁶⁹<http://bio3d.colorado.edu/imod/doc/binspec.html>

²⁷⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/IMODReader.java>

²⁷¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁷²<http://www.openmicroscopy.org/site/support/legacy/>

²⁷³<http://www.improvise.com/>

²⁷⁴<http://www.perkinelmer.com/>

- Improvion'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](#)²⁷⁵

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](#)²⁷⁶

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁷⁷ or the [previous versions](#)²⁷⁸ page to find documentation for the version you are using.

17.52 Improvion Openlab Raw

Extensions: .raw

Developer: [Improvion](#)²⁷⁹

Owner: [PerkinElmer](#)²⁸⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Improvion Openlab Raw*

We currently have:

- an [Openlab Raw specification document](#)²⁸¹ (from 2004 November 09, in HTML)
- a few Openlab Raw datasets

We would like to have:

Ratings

Pixels: 

²⁷⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/OpenlabReader.java>

²⁷⁶<http://www.improvion.com/products/openlab/>


²⁷⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁷⁸<http://www.openmicroscopy.org/site/support/legacy/>

²⁷⁹<http://www.improvion.com/>

²⁸⁰<http://www.perkinelmer.com/>

²⁸¹http://cellularimaging.perkinelmer.com/support/technical_notes/detail.php?id=344

Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [OpenlabRawReader.java](#)²⁸²

Notes:

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.

17.53 Improvision TIFF

Extensions: .tif

Developer: [Improvision](#)²⁸⁶Owner: [PerkinElmer](#)²⁸⁷**Support**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:

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [ImprovisionTiffReader.java](#)²⁸⁸

Notes:

²⁸²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/OpenlabRawReader.java>²⁸³<http://www.improvision.com/products/openlab/>²⁸⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>²⁸⁵<http://www.openmicroscopy.org/site/support/legacy/>²⁸⁶<http://www.improvision.com/>²⁸⁷<http://www.perkinelmer.com/>²⁸⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ImprovisionTiffReader.java>

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](#)²⁸⁹

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁹⁰ or the [previous versions](#)²⁹¹ page to find documentation for the version you are using.

17.54 Inspector OBF

Extensions: .obf, .msr

Developer: [Department of NanoBiophotonics, MPI-BPC](#)²⁹²

Owner: [MPI-BPC](#)²⁹³

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *Inspector OBF*

We currently have:


- a few .msr datasets
- a [specification document](#)²⁹⁴

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [OBFReader.java](#)²⁹⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)²⁹⁶ or the [previous versions](#)²⁹⁷ page to find documentation for the version you are using.

²⁸⁹<http://www.improvision.com/products/openlab/>

²⁹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁹¹<http://www.openmicroscopy.org/site/support/legacy/>

²⁹²<https://inspector.mpibpc.mpg.de/index.html>

²⁹³<http://www.mpibpc.mpg.de/>

²⁹⁴<https://inspector.mpibpc.mpg.de/documentation/fileformat.html>

²⁹⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/OBFReader.java>

²⁹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


²⁹⁷<http://www.openmicroscopy.org/site/support/legacy/>

17.55 InCell 1000

Extensions: .xdce, .tif

Developer: [GE](#)²⁹⁸

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

Source Code: [InCellReader.java](#)²⁹⁹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁰⁰ or the [previous versions](#)³⁰¹ page to find documentation for the version you are using.

17.56 InCell 3000

Extensions: .frm

Developer: [GE](#)³⁰²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *InCell 3000*

Sample Datasets:

²⁹⁸<http://gelifesciences.com/>

²⁹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/InCellReader.java>

³⁰⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰¹<http://www.openmicroscopy.org/site/support/legacy/>

³⁰²<http://gelifesciences.com/>

- [Broad Bioimage Benchmark Collection](#)³⁰³


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](#)³⁰⁴


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁰⁵ or the [previous versions](#)³⁰⁶ page to find documentation for the version you are using.

17.57 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](#)³⁰⁷

³⁰³<http://www.broadinstitute.org/bbbc/BBBC013/>

³⁰⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/InCell3000Reader.java>

³⁰⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰⁶<http://www.openmicroscopy.org/site/support/legacy/>

³⁰⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/INRReader.java>


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³⁰⁸](#) or the [previous versions³⁰⁹](#) page to find documentation for the version you are using.

17.58 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: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [InveonReader.java³¹⁰](#)

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version³¹¹](#) or the [previous versions³¹²](#) page to find documentation for the version you are using.


17.59 IPLab

Extensions: .ipl

Developer: Scanalytics

Owner: was [BD Biosystems³¹³](#), now [BioVision Technologies³¹⁴](#)

Support

BSD-licensed: 

Export: 

³⁰⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰⁹<http://www.openmicroscopy.org/site/support/legacy/>

³¹⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/InveonReader.java>

³¹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹²<http://www.openmicroscopy.org/site/support/legacy/>

³¹³<http://www.bdbiosciences.com/>

³¹⁴<http://www.biovio.com/iplab.htm>

Officially Supported Versions:

Supported Metadata Fields: *IPLab*

Freely Available Software:

- [IPLab Reader plugin for ImageJ](#)³¹⁵


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)

Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [IPLabReader.java](#)³¹⁶

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 IPLab include:

- [Bitplane Imaris](#)³¹⁷
- [SVI Huygens](#)³¹⁸

See also:

[IPLab software review](#)³¹⁹

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³²⁰ or the [previous versions](#)³²¹ page to find documentation for the version you are using.

17.60 IPLab-Mac

Extensions: .ipm

Owner: [BioVision Technologies](#)³²²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

³¹⁵<http://rsb.info.nih.gov/ij/plugins/iplab-reader.html>

³¹⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/IPLabReader.java>

³¹⁷<http://www.bitplane.com/>

³¹⁸<http://svi.nl/>

³¹⁹<http://www.biovis.com/iplab.htm>

³²⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²¹<http://www.openmicroscopy.org/site/support/legacy/>

³²²<http://biovis.com/>

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](#)³²³

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](#)³²⁴ or the [previous versions](#)³²⁵ page to find documentation for the version you are using.

17.61 JEOL

Extensions: .dat, .img, .par

Owner: [JEOL](#)³²⁶

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: 

³²³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/IvisionReader.java>

³²⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²⁵<http://www.openmicroscopy.org/site/support/legacy/>

³²⁶<http://www.jeol.com>


Openness: Presence: Utility: **Additional Information**Source Code: [JEOLReader.java](#)³²⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³²⁸ or the [previous versions](#)³²⁹ page to find documentation for the version you are using.

17.62 JPEG

Extensions: .jpg

Developer: [Independent JPEG Group](#)³³⁰**Support**BSD-licensed: Export: 




Officially Supported Versions:

Supported Metadata Fields: [JPEG](#)

We currently have:

- a [JPEG specification document](#)³³¹ (v1.04, from 1992 September 1, in PDF)
- numerous JPEG datasets
- the ability to produce more datasets

We would like to have:

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [JPEGReader.java](#)³³² Source Code: [JPEGWriter.java](#)³³³

Notes:

Bio-Formats can save individual planes as JPEG. Bio-Formats uses the [Java Image I/O](#)³³⁴ API to read and write JPEG files. JPEG stands for “Joint Photographic Experts Group”.

See also:

³²⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/JEOLReader.java>

³²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²⁹<http://www.openmicroscopy.org/site/support/legacy/>

³³⁰<http://www.ijg.org/>

³³¹<http://www.w3.org/Graphics/JPEG/jfif3.pdf>

³³²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/JPEGReader.java>

³³³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/JPEGWriter.java>

³³⁴<http://docs.oracle.com/javase/6/docs/technotes/guides/imageio/>

JPEG homepage³³⁵


Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³³⁶ or the previous versions³³⁷ page to find documentation for the version you are using.

17.63 JPEG 2000

Extensions: .jp2

Developer: Independent JPEG Group³³⁸

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *JPEG 2000*

Freely Available Software:


- JJ2000 (JPEG 2000 library for Java)³³⁹

We currently have:

- a JPEG 2000 specification document (free draft from 2000, no longer available online)
- a few .jp2 files

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: *JPEG2000Reader.java*³⁴⁰ Source Code: *JPEG2000Writer.java*³⁴¹

Notes:

Bio-Formats uses the *JAI Image I/O Tools*³⁴² 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 version³⁴³ or the previous versions³⁴⁴ page to find documentation for the version you are using.

³³⁵<http://www.jpeg.org/jpeg/index.html>

³³⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³³⁷<http://www.openmicroscopy.org/site/support/legacy/>

³³⁸<http://www.ijg.org/>

³³⁹<http://code.google.com/p/jj2000/>

³⁴⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/JPEG2000Reader.java>

³⁴¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/JPEG2000Writer.java>

³⁴²<https://java.net/projects/jai-imageio>

³⁴³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


³⁴⁴<http://www.openmicroscopy.org/site/support/legacy/>

17.64 JPK

Extensions: .jpk

Developer: [JPK Instruments](#)³⁴⁵

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: 

Utility: 

Additional Information

Source Code: [JPKReader.java](#)³⁴⁶

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁴⁷ or the [previous versions](#)³⁴⁸ page to find documentation for the version you are using.

17.65 JPX

Extensions: .jpx

Developer: [JPEG Committee](#)³⁴⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: [JPX](#)

We currently have:

³⁴⁵<http://www.jpk.com>

³⁴⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/JPKReader.java>

³⁴⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


³⁴⁸<http://www.openmicroscopy.org/site/support/legacy/>


³⁴⁹<http://www.jpeg.org/jpeg2000/>

- a few .jpx files


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [JPXReader.java](#)³⁵⁰

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁵¹ or the [previous versions](#)³⁵² page to find documentation for the version you are using.


17.66 Khoros VIFF (Visualization Image File Format) Bitmap

Extensions: .xv

Developer: [Khoral](#)³⁵³

Owner: [AccuSoft](#)³⁵⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Khoros VIFF (Visualization Image File Format) Bitmap*

Sample Datasets:

- [VIFF Images](#)³⁵⁵

We currently have:

- several VIFF datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

³⁵⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/JPXReader.java>

³⁵¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵²<http://www.openmicroscopy.org/site/support/legacy/>

³⁵³<http://www.khoral.com/company/>

³⁵⁴<http://www.accusoft.com/company/>

³⁵⁵<http://netghost.narod.ru/gff/sample/images/viff/index.htm>

Additional Information

Source Code: [KhorosReader.java](#)³⁵⁶

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁵⁷ or the [previous versions](#)³⁵⁸ page to find documentation for the version you are using.

17.67 Kodak BIP

Extensions: .bip

Developer: [Kodak/Carestream](#)³⁵⁹

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


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [KodakReader.java](#)³⁶⁰

Notes:

See also:

[Information on Image Station systems](#)³⁶¹

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁶² or the [previous versions](#)³⁶³ page to find documentation for the version you are using.

³⁵⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/KhorosReader.java>

³⁵⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵⁸<http://www.openmicroscopy.org/site/support/legacy/>

³⁵⁹<http://carestream.com>

³⁶⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/KodakReader.java>

³⁶¹<http://carestream.com/PublicContent.aspx?langType=1033&id=448953>

³⁶²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁶³<http://www.openmicroscopy.org/site/support/legacy/>

17.68 Lambert Instruments FLIM

Extensions: .fli

Developer: [Lambert Instruments](#)³⁶⁴

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:

Ratings

Pixels: ▲

Metadata: ▲

Openness: ▲

Presence: ▼

Utility: ■

Additional Information

Source Code: [LiFlimReader.java](#)³⁶⁵

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](#)³⁶⁶ or the [previous versions](#)³⁶⁷ page to find documentation for the version you are using.

17.69 LaVision Inspector

Extensions: .msr

Developer: [LaVision BioTec](#)³⁶⁸

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *LaVision Inspector*

We currently have:

³⁶⁴<http://www.lambert-instruments.com>

³⁶⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LiFlimReader.java>

³⁶⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


³⁶⁷<http://www.openmicroscopy.org/site/support/legacy/>

³⁶⁸<http://www.lavisionbiotec.com/>


- a few .msr files


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [InspectorReader.java](#)³⁶⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁷⁰ or the [previous versions](#)³⁷¹ page to find documentation for the version you are using.


17.70 Leica LCS LEI

Extensions: .lei, .tif

Developer: [Leica Microsystems CMS GmbH](#)³⁷²

Owner: [Leica](#)³⁷³

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Leica LCS LEI*

Freely Available Software:

- [Leica LCS Lite](#)³⁷⁴

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: 

³⁶⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/InspectorReader.java>


³⁷⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷¹<http://www.openmicroscopy.org/site/support/legacy/>

³⁷²<http://www.leica-microsystems.com/>

³⁷³<http://www.leica.com/>

³⁷⁴<ftp://ftp.llt.de/softlib/LCSLite/LCSLite2611537.exe>

Utility: 

Additional Information

Source Code: [LeicaReader.java](#)³⁷⁵

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 Imaris³⁷⁶
- SVI Huygens³⁷⁷
- Image-Pro Plus³⁷⁸

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version³⁷⁹ or the previous versions³⁸⁰ page to find documentation for the version you are using.


17.71 Leica LAS AF LIF (Leica Image File Format)

Extensions: .lif

Developer: [Leica Microsystems CMS GmbH](#)³⁸¹

Owner: [Leica](#)³⁸²

Support

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 Lite](#)³⁸³ (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: 

³⁷⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LeicaReader.java>

³⁷⁶<http://www.bitplane.com/>

³⁷⁷<http://svi.nl/>

³⁷⁸<http://www.mediacy.com/>


³⁷⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


³⁸⁰<http://www.openmicroscopy.org/site/support/legacy/>

³⁸¹<http://www.leica-microsystems.com/>

³⁸²<http://www.leica.com/>

³⁸³<http://www.leica-microsystems.com/products/microscope-software/software-for-life-science-research/las-x/>

Presence: 

Utility: 

Additional Information

Source Code: [LIFReader.java](#)³⁸⁴

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 Imaris](#)³⁸⁵
- [SVI Huygens](#)³⁸⁶
- [Amira](#)³⁸⁷


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁸⁸ or the [previous versions](#)³⁸⁹ page to find documentation for the version you are using.

17.72 Leica SCN

Extensions: .scn

Developer: [Leica Microsystems](#)³⁹⁰

Support

BSD-licensed: 

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

³⁸⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LIFReader.java>

³⁸⁵<http://www.bitplane.com/>

³⁸⁶<http://svi.nl/>

³⁸⁷<http://www.amira.com/>

³⁸⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁸⁹<http://www.openmicroscopy.org/site/support/legacy/>

³⁹⁰<http://www.leica-microsystems.com/>

Source Code: [LeicaSCNReader.java](#)³⁹¹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁹² or the [previous versions](#)³⁹³ page to find documentation for the version you are using.

17.73 LEO

Extensions: .sxm

Owner: [Zeiss](#)³⁹⁴

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


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [LEOReader.java](#)³⁹⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)³⁹⁶ or the [previous versions](#)³⁹⁷ page to find documentation for the version you are using.

³⁹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LeicaSCNReader.java>

³⁹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹³<http://www.openmicroscopy.org/site/support/legacy/>

³⁹⁴<http://www.zeiss.de>

³⁹⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LEOReader.java>

³⁹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


³⁹⁷<http://www.openmicroscopy.org/site/support/legacy/>

17.74 Li-Cor L2D

Extensions: .l2d, .tif, .scn

Owner: [LiCor Biosciences](#)³⁹⁸

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


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [L2DReader.java](#)³⁹⁹

Notes:

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 version](#)⁴⁰⁰ or the [previous versions](#)⁴⁰¹ page to find documentation for the version you are using.

17.75 LIM (Laboratory Imaging/Nikon)

Extensions: .lim

Owner: [Laboratory Imaging](#)⁴⁰²

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *LIM (Laboratory Imaging/Nikon)*

³⁹⁸<http://www.licor.com/>

³⁹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/L2DReader.java>

⁴⁰⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰¹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰²<http://www.lim.cz/>


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.java](#)⁴⁰³

Notes:

Bio-Formats only supports uncompressed LIM files.

Commercial applications that support LIM include:

- NIS Elements⁴⁰⁴

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁰⁵ or the [previous versions](#)⁴⁰⁶ page to find documentation for the version you are using.

17.76 MetaMorph 7.5 TIFF

Extensions: .tiff

Owner: [Molecular Devices](#)⁴⁰⁷

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: 


⁴⁰³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/LIMReader.java>


⁴⁰⁴<http://www.nis-elements.com/>

⁴⁰⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰⁷<http://www.moleculardevices.com/>

Presence: 

Utility: 

Additional Information

Source Code: [MetamorphTiffReader.java](#)⁴⁰⁸

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁰⁹ or the [previous versions](#)⁴¹⁰ page to find documentation for the version you are using.

17.77 MetaMorph Stack (STK)

Extensions: .stk, .nd

Owner: [Molecular Devices](#)⁴¹¹

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)
- 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](#)⁴¹²

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](#)⁴¹³

⁴⁰⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MetamorphTiffReader.java>

⁴⁰⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴¹⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁴¹¹<http://www.moleculardevices.com/>

⁴¹²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MetamorphReader.java>

⁴¹³<http://www.bitplane.com/>

- SVI Huygens⁴¹⁴
- DIMIN⁴¹⁵

See also:

Metamorph imaging system overview⁴¹⁶


Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴¹⁷ or the previous versions⁴¹⁸ page to find documentation for the version you are using.

17.78 MIAS (Maia Scientific)

Extensions: .tif

Developer: Maia Scientific⁴¹⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *MIAS (Maia Scientific)*

We currently have:


- several MIAS datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: MIASReader.java⁴²⁰

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴²¹ or the previous versions⁴²² page to find documentation for the version you are using.

⁴¹⁴<http://svi.nl/>

⁴¹⁵<http://dimin.net/>

⁴¹⁶<http://www.metamorph.com/>

⁴¹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴¹⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴¹⁹<http://www.selectscience.net/supplier/maia-scientific/?compID=6088>

⁴²⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MIASReader.java>

⁴²¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁴²²<http://www.openmicroscopy.org/site/support/legacy/>

17.79 Micro-Manager

Extensions: .tif, .txt, .xml

Developer: [Vale Lab](http://valelab.ucsf.edu/)⁴²³

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Micro-Manager*

Freely Available Software:


- *Micro-Manager*⁴²⁴

We currently have:

- many Micro-manager datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [MicromanagerReader.java](#)⁴²⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴²⁶ or the [previous versions](#)⁴²⁷ page to find documentation for the version you are using.

17.80 MINC MRI

Extensions: .mnc

Developer: [McGill University](http://www.bic.mni.mcgill.ca/ServicesSoftware/MINC)⁴²⁸

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *MINC MRI*

Freely Available Software:

⁴²³<http://valelab.ucsf.edu/>

⁴²⁴<http://micro-manager.org/>

⁴²⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/MicromanagerReader.java>

⁴²⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴²⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴²⁸<http://www.bic.mni.mcgill.ca/ServicesSoftware/MINC>

- [MINC](#)⁴²⁹

We currently have:

- a few MINC files

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [MINCReader.java](#)⁴³⁰

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴³¹ or the [previous versions](#)⁴³² page to find documentation for the version you are using.

17.81 Minolta MRW

Extensions: .mrw

Developer: [Minolta](#)⁴³³

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: [Minolta MRW](#)

Freely Available Software:

- [dcraw](#)⁴³⁴

We currently have:

- several .mrw files

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

⁴²⁹<http://www.bic.mni.mcgill.ca/ServicesSoftware/MINC>


⁴³⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MINCReader.java>

⁴³¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³²<http://www.openmicroscopy.org/site/support/legacy/>

⁴³³<http://www.konicaminolta.com/>

⁴³⁴<http://www.cybercom.net/%7Edcoffin/dcraw/>

Utility: 

Additional Information

Source Code: [MRWReader.java](#)⁴³⁵

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴³⁶ or the [previous versions](#)⁴³⁷ page to find documentation for the version you are using.

17.82 MNG (Multiple-image Network Graphics)

Extensions: .mng

Developer: [MNG Development Group](#)⁴³⁸

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *MNG (Multiple-image Network Graphics)*

Freely Available Software:

- [libmng \(MNG reference library\)](#)⁴³⁹

Sample Datasets:


- [MNG sample files](#)⁴⁴⁰

We currently have:


- the [libmng-testsuites](#)⁴⁴¹ 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](#)⁴⁴²

Notes:

See also:

⁴³⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MRWReader.java>

⁴³⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴³⁸<http://www.libpng.org/pub/mng/mngnews.html>

⁴³⁹<http://sourceforge.net/projects/libmng/>

⁴⁴⁰<http://sourceforge.net/projects/libmng/files/libmng-testsuites/MNGsuite-1.0/MNGsuite.zip/download>

⁴⁴¹<http://downloads.sourceforge.net/libmng/MNGsuite-20030305.zip>

⁴⁴²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/MNGReader.java>

MNG homepage⁴⁴³ MNG specification⁴⁴⁴

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁴⁵ or the previous versions⁴⁴⁶ page to find documentation for the version you are using.

17.83 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: 

Presence: 

Utility: 

Additional Information

Source Code: [MolecularImagingReader.java](#)⁴⁴⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁴⁴⁸ or the previous versions⁴⁴⁹ page to find documentation for the version you are using.

17.84 MRC (Medical Research Council)

Extensions: .mrc

Developer: [MRC Laboratory of Molecular Biology](#)⁴⁵⁰

⁴⁴³<http://www.libpng.org/pub/mng/>

⁴⁴⁴<http://www.libpng.org/pub/mng/spec>

⁴⁴⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴⁶<http://www.openmicroscopy.org/site/support/legacy/>


⁴⁴⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MolecularImagingReader.java>

⁴⁴⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁵⁰<http://www2.mrc-lmb.cam.ac.uk/>

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *MRC (Medical Research Council)*

Sample Datasets:


- [golgi.mrc](#)⁴⁵¹

We currently have:


- an [MRC specification document](#)⁴⁵² (in HTML)
- another [MRC specification document](#)⁴⁵³ (in TXT)
- a few MRC datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [MRCReader.java](#)⁴⁵⁴

Notes:

Commercial applications that support MRC include:

- [Bitplane Imaris](#)⁴⁵⁵

See also:

[MRC on Wikipedia](#)⁴⁵⁶

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁵⁷ or the [previous versions](#)⁴⁵⁸ page to find documentation for the version you are using.

17.85 NEF (Nikon Electronic Format)

Extensions: .nef, .tif

Developer: [Nikon](#)⁴⁵⁹

Support

BSD-licensed: 

⁴⁵¹http://bio3d.colorado.edu/imod/files/imod_data.tar.gz

⁴⁵²http://ami.scripps.edu/software/mrc_tools/mrc_specification.php

⁴⁵³http://bio3d.colorado.edu/imod/doc/mrc_format.txt

⁴⁵⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/MRCReader.java>


⁴⁵⁵<http://www.bitplane.com/>

⁴⁵⁶http://en.wikipedia.org/wiki/MRC_%28file_format%29

⁴⁵⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁵⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁵⁹<http://www.nikon.com/>

Export: 

Officially Supported Versions:

Supported Metadata Fields: *NEF (Nikon Electronic Format)*

Sample Datasets:

- [neffile1.zip](#)⁴⁶⁰
- [Sample NEF images](#)⁴⁶¹

We currently have:

- a NEF specification document (v0.1, from 2003, in PDF)
- several NEF datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [NikonReader.java](#)⁴⁶²

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](#)⁴⁶³


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁶⁴ or the [previous versions](#)⁴⁶⁵ page to find documentation for the version you are using.

17.86 NifTI

Extensions: .img, .hdr

Developer: [National Institutes of Health](#)⁴⁶⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *NifTI*

Sample Datasets:

⁴⁶⁰http://www.outbackphoto.com/workshop/NEF_conversion/neffile1.zip

⁴⁶¹http://www.nikondigital.org/articles/library/nikon_d2x_first_impressions.htm

⁴⁶²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NikonReader.java>

⁴⁶³http://www.outbackphoto.com/workshop/NEF_conversion/nefconversion.html

⁴⁶⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁶⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁶⁶<http://www.nih.gov/>


- Official test data⁴⁶⁷

We currently have:


- NIfTI specification documents⁴⁶⁸
- several NIfTI datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [NiftiReader.java](#)⁴⁶⁹

Notes:


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 versions](#)⁴⁷¹ page to find documentation for the version you are using.

17.87 Nikon Elements TIFF

Extensions: .tiff

Developer: [Nikon](#)⁴⁷²

Support

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: 

⁴⁶⁷<http://nifti.nimh.nih.gov/nifti-1/data>


⁴⁶⁸<http://nifti.nimh.nih.gov/nifti-1/>

⁴⁶⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NiftiReader.java>

⁴⁷⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷¹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁷²<http://www.nikon.com>

Utility: 

Additional Information

Source Code: [NikonElementsTiffReader.java](#)⁴⁷³

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁷⁴ or the [previous versions](#)⁴⁷⁵ page to find documentation for the version you are using.

17.88 Nikon EZ-C1 TIFF

Extensions: .tiff

Developer: [Nikon](#)⁴⁷⁶

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: 

Presence: 

Utility: 

Additional Information

Source Code: [NikonTiffReader.java](#)⁴⁷⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁷⁸ or the [previous versions](#)⁴⁷⁹ page to find documentation for the version you are using.

17.89 Nikon NIS-Elements ND2

Extensions: .nd2

Developer: [Nikon USA](#)⁴⁸⁰

⁴⁷³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NikonElementsTiffReader.java>

⁴⁷⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁷⁶<http://www.nikon.com/>

⁴⁷⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NikonTiffReader.java>

⁴⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁸⁰<http://www.nikonusa.com/>

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Nikon NIS-Elements ND2*

Freely Available Software:

- [NIS-Elements Viewer from Nikon](#)⁴⁸¹

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](#)⁴⁸²

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](#)⁴⁸³ library to read ND2 files compressed with JPEG-2000.

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](#)⁴⁸⁴ installed. Additionally, you will need to download [LegacyND2Reader.dll](#)⁴⁸⁵ 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](#)⁴⁸⁶ or the [previous versions](#)⁴⁸⁷ page to find documentation for the version you are using.

17.90 NRRD (Nearly Raw Raster Data)

Extensions: .nrrd, .nhdr, .raw, .txt

Developer: [Teem developers](#)⁴⁸⁸

Support

BSD-licensed: ✅

Export: ❌

⁴⁸¹<http://www.nikoninstruments.com/Products/Software/NIS-Elements-Advanced-Research/NIS-Elements-Viewer>

⁴⁸²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/NativeND2Reader.java>

⁴⁸³<http://java.net/projects/jai-imageio>

⁴⁸⁴<http://rsb.info.nih.gov/ij/plugins/nd2-reader.html>

⁴⁸⁵<https://github.com/openmicroscopy/bioformats/blob/develop/lib/LegacyND2Reader.dll?raw=true>

⁴⁸⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁸⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁸⁸<http://teem.sourceforge.net/>

Officially Supported Versions:

Supported Metadata Fields: *NRRD (Nearly Raw Raster Data)*

Freely Available Software:

- [nrrd \(NRRD reference library\)](#)⁴⁸⁹

Sample Datasets:

- [Diffusion tensor MRI datasets](#)⁴⁹⁰

We currently have:

- an [nrrd specification document](#)⁴⁹¹ (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](#)⁴⁹²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁹³ or the [previous versions](#)⁴⁹⁴ page to find documentation for the version you are using.

17.91 Olympus CellR/APL

Extensions: .apl, .mtb, .tnb, .tif, .obsep

Owner: [Olympus](#)⁴⁹⁵

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

⁴⁸⁹<http://teem.sourceforge.net/nrrd/>

⁴⁹⁰<http://www.sci.utah.edu/%7Egk/DTI-data/>

⁴⁹¹<http://teem.sourceforge.net/nrrd/format.html>

⁴⁹²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/NRRDReader.java>


⁴⁹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁹⁴<http://www.openmicroscopy.org/site/support/legacy/>


⁴⁹⁵<http://www.olympus.com/>


- an official specification document


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [APLReader.java](#)⁴⁹⁶

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁴⁹⁷ or the [previous versions](#)⁴⁹⁸ page to find documentation for the version you are using.

17.92 Olympus FluoView FV1000

Extensions: .oib, .oif

Owner: [Olympus](#)⁴⁹⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 1.0, 2.0

Supported Metadata Fields: *Olympus FluoView FV1000*

Freely Available Software:

- [FV-Viewer from Olympus](#)⁵⁰⁰

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: 


⁴⁹⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/APLReader.java>


⁴⁹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁹⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁹⁹<http://www.olympus.com/>

⁵⁰⁰http://www.olympus.co.uk/microscopy/22_FluoView_FV1000__Confocal_Microscope.htm

Presence: 

Utility: 

Additional Information

Source Code: [FV1000Reader.java](#)⁵⁰¹

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](#)⁵⁰² 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](#)⁵⁰³
- [SVI Huygens](#)⁵⁰⁴

See also:

[Olympus FluoView Resource Center](#)⁵⁰⁵


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁰⁶ or the [previous versions](#)⁵⁰⁷ page to find documentation for the version you are using.

17.93 Olympus FluoView TIFF

Extensions: .tif

Owner: [Olympus](#)⁵⁰⁸

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Olympus FluoView TIFF*

Freely Available Software:

- [DIMIN](#)⁵⁰⁹

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: 

⁵⁰¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FV1000Reader.java>

⁵⁰²<http://jakarta.apache.org/poi/>

⁵⁰³<http://www.bitplane.com/>

⁵⁰⁴<http://svi.nl/>





⁵⁰⁵<http://www.olympusfluoview.com>

⁵⁰⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁰⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁰⁸<http://www.olympus.com/>

⁵⁰⁹<http://www.dimin.net/>

Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [FluoviewReader.java](#)⁵¹⁰

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](#)⁵¹¹
- [SVI Huygens](#)⁵¹²

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵¹³ or the [previous versions](#)⁵¹⁴ page to find documentation for the version you are using.

17.94 Olympus ScanR

Extensions: .xml, .dat, .tif

Developer: [Olympus](#)⁵¹⁵Owner: [Olympus](#)⁵¹⁶**Support**BSD-licensed: Export: 



Officially Supported Versions:

Supported Metadata Fields: *Olympus ScanR*

We currently have:

- several ScanR datasets

We would like to have:

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**⁵¹⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/FluoviewReader.java>⁵¹¹<http://www.bitplane.com/>⁵¹²<http://svi.nl/>⁵¹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁵¹⁴<http://www.openmicroscopy.org/site/support/legacy/>⁵¹⁵<http://www.olympus.com/>⁵¹⁶<http://www.olympus.com/>

Source Code: [ScanrReader.java](#)⁵¹⁷

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵¹⁸ or the [previous versions](#)⁵¹⁹ page to find documentation for the version you are using.

17.95 Olympus SIS TIFF

Extensions: .tiff

Developer: [Olympus](#)⁵²⁰

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: 

Additional Information

Source Code: [SISReader.java](#)⁵²¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵²² or the [previous versions](#)⁵²³ page to find documentation for the version you are using.

17.96 OME-TIFF

Extensions: .ome.tiff⁵²⁴

Developer: [Open Microscopy Environment](#)⁵²⁵

Support

⁵¹⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ScanrReader.java>

⁵¹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵¹⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁵²⁰<http://www.olympus-sis.com/>

⁵²¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SISReader.java>

⁵²²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵²³<http://www.openmicroscopy.org/site/support/legacy/>

⁵²⁴<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff/index.html>

⁵²⁵<http://www.openmicroscopy.org/>

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 document⁵²⁶ (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](#)⁵²⁷ Source Code: [OMETiffWriter.java](#)⁵²⁸

Notes:

Bio-Formats can save image stacks as *OME-TIFF*.

Commercial applications that support *OME-TIFF* include:

- [Bitplane Imaris](#)⁵²⁹
- [SVI Huygens](#)⁵³⁰

See also:

[OME-TIFF technical overview](#)⁵³¹

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁵³² or the previous versions⁵³³ page to find documentation for the version you are using.

17.97 OME-XML

Extensions: *.ome*⁵³⁴

Developer: [Open Microscopy Environment](#)⁵³⁵

Support

BSD-licensed: 

⁵²⁶<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff/specification.html>

⁵²⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/OMETiffReader.java>

⁵²⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/OMETiffWriter.java>

⁵²⁹<http://www.bitplane.com/>

⁵³⁰<http://svi.nl/>

⁵³¹<http://www.openmicroscopy.org/site/support/ome-model/ome-tiff/index.html>

⁵³²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵³³<http://www.openmicroscopy.org/site/support/legacy/>

⁵³⁴<http://www.openmicroscopy.org/site/support/ome-model/ome-xml/index.html>

⁵³⁵<http://www.openmicroscopy.org/>

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 documents⁵³⁶
- 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.java*⁵³⁷ Source Code: *OMEXMLWriter.java*⁵³⁸

Notes:

Bio-Formats uses the *OME-XML Java library*⁵³⁹ to read OME-XML files.

Commercial applications that support OME-XML include:

- *Bitplane Imaris*⁵⁴⁰
- *SVI Huygens*⁵⁴¹


Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁵⁴² or the previous versions⁵⁴³ page to find documentation for the version you are using.

17.98 Oxford Instruments

Extensions: .top

Owner: *Oxford Instruments*⁵⁴⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Oxford Instruments*

We currently have:

⁵³⁶<http://www.openmicroscopy.org/Schemas/>

⁵³⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/OMEXMLReader.java>

⁵³⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/OMEXMLWriter.java>

⁵³⁹<http://www.openmicroscopy.org/site/support/ome-model/ome-xml/java-library.html>

⁵⁴⁰<http://www.bitplane.com/>

⁵⁴¹<http://svi.nl/>

⁵⁴²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁴³<http://www.openmicroscopy.org/site/support/legacy/>


⁵⁴⁴<http://www.oxinst.com>


- 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.java](#)⁵⁴⁵

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁴⁶ or the [previous versions](#)⁵⁴⁷ page to find documentation for the version you are using.

17.99 PCORAW

Extensions: .pcoraw, .rec

Developer: [PCO](#)⁵⁴⁸

Support

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

⁵⁴⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/OxfordInstrumentsReader.java>

⁵⁴⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁴⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁴⁸<http://www.pco.de/>

Source Code: [PCORAWReader.java](#)⁵⁴⁹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁵⁰ or the [previous versions](#)⁵⁵¹ page to find documentation for the version you are using.

17.100 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 file

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [PCXReader.java](#)⁵⁵²

Notes:

Commercial applications that support PCX include [Zeiss LSM Image Browser](#)⁵⁵³.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁵⁴ or the [previous versions](#)⁵⁵⁵ page to find documentation for the version you are using.

17.101 Perkin Elmer Densitometer

Extensions: .pds

Developer: [Perkin Elmer](#)⁵⁵⁶

⁵⁴⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PCORAWReader.java>

⁵⁵⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁵¹<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁵²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/PCXReader.java>

⁵⁵³http://www.zeiss.com.au/microscopy/en_au/downloads/lsm-5-series.html

⁵⁵⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁵⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁵⁶<http://www.perkinelmer.com>

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](#)⁵⁵⁷

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁵⁸ or the [previous versions](#)⁵⁵⁹ page to find documentation for the version you are using.

17.102 PerkinElmer Nuance

Extensions: .im3

Developer: [PerkinElmer](#)⁵⁶⁰

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: 🟡

⁵⁵⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PDSReader.java>

⁵⁵⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁵⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁶⁰<http://www.perkinelmer.com/>


Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [IM3Reader.java](#)⁵⁶¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁶² or the [previous versions](#)⁵⁶³ page to find documentation for the version you are using.

17.103 PerkinElmer Operetta

Extensions: .tiff, .xml

Developer: [PerkinElmer](#)⁵⁶⁴**Support**BSD-licensed: Export: 

Officially Supported Versions:




Supported Metadata Fields: *PerkinElmer Operetta*

We currently have:

- a few sample datasets

We would like to have:

- an official specification document
- more sample datasets

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [OperettaReader.java](#)⁵⁶⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁶⁶ or the [previous versions](#)⁵⁶⁷ page to find documentation for the version you are using.

⁵⁶¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/IM3Reader.java>

⁵⁶²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁶³<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁶⁴<http://www.perkinelmer.com/>

⁵⁶⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/OperettaReader.java>

⁵⁶⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁵⁶⁷<http://www.openmicroscopy.org/site/support/legacy/>

17.104 PerkinElmer UltraView

Extensions: .tif, .2, .3, .4, etc.

Owner: [PerkinElmer](#)⁵⁶⁸

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](#)⁵⁶⁹

Notes:

Other associated extensions include: .tim, .zpo, .csv, .htm, .cfg, .ano, .rec

Commercial applications that support this format include:

- [Bitplane Imaris](#)⁵⁷⁰
- [Image-Pro Plus](#)⁵⁷¹

See also:

[PerkinElmer UltraView system overview](#)⁵⁷²

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁷³ or the [previous versions](#)⁵⁷⁴ page to find documentation for the version you are using.

⁵⁶⁸<http://www.perkinelmer.com/>

⁵⁶⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PerkinElmerReader.java>

⁵⁷⁰<http://www.bitplane.com/>

⁵⁷¹<http://www.mediacy.com/>

⁵⁷²<http://www.perkinelmer.com/pages/020/cellularimaging/products/ultraviewvoxsyste.msoverview.xhtml>

⁵⁷³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁵⁷⁴<http://www.openmicroscopy.org/site/support/legacy/>

17.105 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 filter](#)⁵⁷⁵

We currently have:


- a [PGM specification document](#)⁵⁷⁶ (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](#)⁵⁷⁷

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁷⁸ or the [previous versions](#)⁵⁷⁹ page to find documentation for the version you are using.

17.106 Adobe Photoshop PSD

Extensions: .psd

Developer: [Adobe](#)⁵⁸⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions: 1.0

Supported Metadata Fields: *Adobe Photoshop PSD*

⁵⁷⁵<http://netpbm.sourceforge.net/>

⁵⁷⁶<http://netpbm.sourceforge.net/doc/pgm.html>

⁵⁷⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/PGMReader.java>

⁵⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁸⁰<http://www.adobe.com/>


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](#)⁵⁸¹

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁸² or the [previous versions](#)⁵⁸³ page to find documentation for the version you are using.

17.107 Photoshop TIFF

Extensions: .tif, .tiff

Developer: [Adobe](#)⁵⁸⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:


Supported Metadata Fields: *Photoshop TIFF*

We currently have:

- a Photoshop TIFF specification document
- a few Photoshop TIFF files

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

⁵⁸¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PSDReader.java>

⁵⁸²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁸³<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁸⁴<http://www.adobe.com>

Additional Information

Source Code: [PhotoshopTiffReader.java](#)⁵⁸⁵

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁸⁶ or the [previous versions](#)⁵⁸⁷ page to find documentation for the version you are using.

17.108 PicoQuant Bin

Extensions: .bin

Developer: [PicoQuant](#)⁵⁸⁸

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *PicoQuant Bin*

Freely Available Software:


- [SymphoTime64](#)⁵⁸⁹

We currently have:

- a few example datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [PQBinReader.java](#)⁵⁹⁰

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁵⁹¹ or the [previous versions](#)⁵⁹² page to find documentation for the version you are using.

⁵⁸⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PhotoshopTiffReader.java>

⁵⁸⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁸⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁸⁸<http://www.picoquant.com/>

⁵⁸⁹<http://www.picoquant.com/products/category/software/symphotime-64-fluorescence-lifetime-imaging-and-correlation-software>

⁵⁹⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PQBinReader.java>

⁵⁹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁵⁹²<http://www.openmicroscopy.org/site/support/legacy/>


17.109 PICT (Macintosh Picture)

Extensions: .pict

Developer: [Apple Computer](#)⁵⁹³

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](#)⁵⁹⁴

Notes:

[QuickTime for Java](#)⁵⁹⁵ is required for reading vector files and some compressed files.

See also:

[PICT technical overview](#)⁵⁹⁶ [Another PICT technical overview](#)⁵⁹⁷


Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁵⁹⁸ or the previous versions⁵⁹⁹ page to find documentation for the version you are using.

17.110 PNG (Portable Network Graphics)

Extensions: .png

Developer: [PNG Development Group](#)⁶⁰⁰

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

⁵⁹³<http://www.apple.com>

⁵⁹⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/PictReader.java>

⁵⁹⁵<http://www.apple.com/quicktime/download/standalone.html>

⁵⁹⁶<http://www.faqs.org/faqs/graphics/fileformats-faq/part3/section-107.html>

⁵⁹⁷<http://www.prepressure.com/formats/pict/fileformat.htm>

⁵⁹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁹⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁰⁰<http://www.libpng.org/pub/png/pngnews.html>

Supported Metadata Fields: *PNG (Portable Network Graphics)*

Freely Available Software:

- [PNG Writer plugin for ImageJ](#)⁶⁰¹

We currently have:

- a [PNG specification document](#)⁶⁰² (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](#)⁶⁰³

Notes:

Bio-Formats uses the [Java Image I/O](#)⁶⁰⁴ API to read and write PNG files.

See also:

[PNG technical overview](#)⁶⁰⁵

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁰⁶ or the [previous versions](#)⁶⁰⁷ page to find documentation for the version you are using.

17.111 Prairie Technologies TIFF

Extensions: .tif, .xml, .cfg

Developer: [Prairie Technologies](#)⁶⁰⁸

Support

BSD-licensed:

Export:

Officially Supported Versions:

Supported Metadata Fields: *Prairie Technologies TIFF*

We currently have:

- many Prairie datasets

⁶⁰¹<http://rsb.info.nih.gov/ij/plugins/png-writer.html>

⁶⁰²<http://www.libpng.org/pub/png/spec/iso/>

⁶⁰³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/APNGReader.java>

⁶⁰⁴<http://docs.oracle.com/javase/6/docs/technotes/guides/imageio/>

⁶⁰⁵<http://www.libpng.org/pub/png/>

⁶⁰⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁰⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁰⁸<http://www.prairie-technologies.com/>

We would like to have:

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

Source Code: [PrairieReader.java](#)⁶⁰⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶¹⁰ or the [previous versions](#)⁶¹¹ page to find documentation for the version you are using.

17.112 Quesant

Extensions: .afm

Developer: Quesant Instrument Corporation

Owner: [KLA-Tencor Corporation](#)⁶¹²

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

Ratings

Pixels:

Metadata:

Openness:

Presence:

Utility:

Additional Information

⁶⁰⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PrairieReader.java>

⁶¹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶¹¹<http://www.openmicroscopy.org/site/support/legacy/>

⁶¹²<http://www.kla-tencor.com/surface-profilometry-and-metrology.html>

Source Code: [QuesantReader.java](#)⁶¹³

Notes:


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.

17.113 QuickTime Movie

Extensions: .mov

Owner: [Apple Computer](#)⁶¹⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *QuickTime Movie*

Freely Available Software:

- [QuickTime Player](#)⁶¹⁷


We currently have:

- a [QuickTime specification document](#)⁶¹⁸ (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


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [NativeQTReader.java](#)⁶¹⁹ Source Code: [QTWriter.java](#)⁶²⁰

Notes:

Bio-Formats has two modes of operation for QuickTime:

⁶¹³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/QuesantReader.java>

⁶¹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶¹⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁶¹⁶<http://www.apple.com/>

⁶¹⁷<http://www.apple.com/quicktime/download/>

⁶¹⁸<http://developer.apple.com/documentation/Quicktime/QTFF/>

⁶¹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/NativeQTReader.java>

⁶²⁰<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/QTWriter.java>

- QTJava mode requires [QuickTime](#)⁶²¹ 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
mjpgb	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](#)⁶²²

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶²³ or the [previous versions](#)⁶²⁴ page to find documentation for the version you are using.

17.114 RHK

Extensions: .sm2, .sm3

Owner: [RHK Technologies](#)⁶²⁵

Support

BSD-licensed: 

Export: 

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






⁶²¹<http://www.apple.com/quicktime/download/>

⁶²²<http://www.apple.com/quicktime/>

⁶²³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶²⁴<http://www.openmicroscopy.org/site/support/legacy/>


⁶²⁵<http://www.rhk-tech.com>

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [RHKReader.java](#)⁶²⁶

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶²⁷ or the [previous versions](#)⁶²⁸ page to find documentation for the version you are using.

17.115 SBIG

Owner: [Santa Barbara Instrument Group \(SBIG\)](#)⁶²⁹**Support**BSD-licensed: Export: 

Officially Supported Versions:



Supported Metadata Fields: [SBIG](#)

We currently have:

- an [official SBIG specification document](#)⁶³⁰
- a few SBIG files

We would like to have:

- more SBIG files

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [SBIGReader.java](#)⁶³¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶³² or the [previous](#)

⁶²⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/RHKReader.java>⁶²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁶²⁸<http://www.openmicroscopy.org/site/support/legacy/>⁶²⁹<http://www.sbig.com>⁶³⁰<http://sbig.impulse.net/pdf/files/file.format.pdf>⁶³¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SBIGReader.java>


[versions](#)⁶³³ page to find documentation for the version you are using.

17.116 Seiko

Extensions: .xqd, .xqf

Owner: [Seiko](#)⁶³⁴

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


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [SeikoReader.java](#)⁶³⁵

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶³⁶ or the [previous versions](#)⁶³⁷ page to find documentation for the version you are using.

17.117 SimplePCI & HCImage

Extensions: .cxd

Developer: [Compix](#)⁶³⁸

Support

BSD-licensed: 

⁶³²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶³³<http://www.openmicroscopy.org/site/support/legacy/>

⁶³⁴<http://www.seiko.co.jp/en/index.php>

⁶³⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SeikoReader.java>

⁶³⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶³⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁶³⁸<http://hcimage.com>

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: [PCIRReader.java](#)⁶³⁹

Notes:

Bio-Formats uses a modified version of the [Apache Jakarta POI library](#)⁶⁴⁰ to read CXD files.

See also:

[SimplePCI software overview](#)⁶⁴¹

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.

17.118 SimplePCI & HCImage TIFF

Extensions: .tiff

Developer: [Hamamatsu](#)⁶⁴⁴

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *SimplePCI & HCImage TIFF*

We currently have:

- a few SimplePCI TIFF datasets

We would like to have:

- more SimplePCI TIFF datasets

⁶³⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/PCIRReader.java>





⁶⁴⁰<http://jakarta.apache.org/poi/>

⁶⁴¹<http://hcmimage.com/simple-pci-legacy/>

⁶⁴²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁴³<http://www.openmicroscopy.org/site/support/legacy/>


⁶⁴⁴<http://hcmimage.com/simple-pci-legacy/>

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [SimplePCITiffReader.java](#)⁶⁴⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁴⁶ or the [previous versions](#)⁶⁴⁷ page to find documentation for the version you are using.

17.119 SM Camera

SupportBSD-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

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [SMCameraReader.java](#)⁶⁴⁸

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁴⁹ or the [previous versions](#)⁶⁵⁰ page to find documentation for the version you are using.


⁶⁴⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SimplePCITiffReader.java>⁶⁴⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁶⁴⁷<http://www.openmicroscopy.org/site/support/legacy/>⁶⁴⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SMCameraReader.java>⁶⁴⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁶⁵⁰<http://www.openmicroscopy.org/site/support/legacy/>

17.120 SPIDER

Extensions: .spi, .stk

Developer: [Wadsworth Center](#)⁶⁵¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *SPIDER*

Freely Available Software:


- [SPIDER](#)⁶⁵²

We currently have:


- a few example datasets
- [official file format documentation](#)⁶⁵³


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [SpiderReader.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 Targa

Extensions: .tga

Developer: [Truevision](#)⁶⁵⁷

Support

BSD-licensed: 

⁶⁵¹http://www.wadsworth.org/spider_doc/spider/docs/spider.html

⁶⁵²http://www.wadsworth.org/spider_doc/spider/docs/spider.html

⁶⁵³http://www.wadsworth.org/spider_doc/spider/docs/image_doc.html

⁶⁵⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/SpiderReader.java>

⁶⁵⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁵⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁵⁷<http://www.truevision.com>

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](#)⁶⁵⁸


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁵⁹ or the [previous versions](#)⁶⁶⁰ page to find documentation for the version you are using.

17.122 Text

Extensions: .txt

Support

BSD-licensed: 

Export: 


Officially Supported Versions:

Supported Metadata Fields: *Text*

We currently have:


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

⁶⁵⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/TargaReader.java>

⁶⁵⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁶⁰<http://www.openmicroscopy.org/site/support/legacy/>

Source Code: [TextReader.java](#)⁶⁶¹

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](#)⁶⁶² or the [previous versions](#)⁶⁶³ page to find documentation for the version you are using.

17.123 TIFF (Tagged Image File Format)

Extensions: .tif

Developer: Aldus and Microsoft

Owner: [Adobe](#)⁶⁶⁴

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *TIFF (Tagged Image File Format)*

Sample Datasets:


- [LZW TIFF data gallery](#)⁶⁶⁵
- [Big TIFF](#)⁶⁶⁶

We currently have:


- a [TIFF specification document](#)⁶⁶⁷ (v6.0, from 1992 June 3, in PDF)
- many TIFF datasets
- a few BigTIFF datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [TiffReader.java](#)⁶⁶⁸ Source Code: [TiffWriter.java](#)⁶⁶⁹

Notes:

Bio-Formats can also read BigTIFF files (TIFF files larger than 4 GB). Bio-Formats can save image stacks as TIFF or BigTIFF.

⁶⁶¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/TextReader.java>

⁶⁶²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁶³<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁶⁴<http://www.adobe.com>

⁶⁶⁵http://marlin.life.utsa.edu/Data_Gallery.html

⁶⁶⁶<http://www.awaresystems.be/imaging/tiff/bigtiff.html#samples>

⁶⁶⁷<http://partners.adobe.com/asn/developer/PDFS/TN/TIFF6.pdf>

⁶⁶⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/TiffReader.java>

⁶⁶⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/out/TiffWriter.java>

See also:

TIFF technical overview⁶⁷⁰ BigTIFF technical overview⁶⁷¹

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁶⁷² or the previous versions⁶⁷³ page to find documentation for the version you are using.

17.124 TillPhotonics TillVision

Extensions: .vws

Developer: TILL Photonics⁶⁷⁴

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*⁶⁷⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁶⁷⁶ or the previous versions⁶⁷⁷ page to find documentation for the version you are using.

17.125 Topometrix

Extensions: .tfr, .ffr, .zfr, .zfp, .2fl

Owner: TopoMetrix (now Veeco)⁶⁷⁸

⁶⁷⁰<http://www.awaresystems.be/imaging/tiff/faq.html#q3>

⁶⁷¹<http://www.awaresystems.be/imaging/tiff/bigtiff.html>

⁶⁷²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁷³<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁷⁴<http://www.till-photonics.com/>

⁶⁷⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/TillVisionReader.java>

⁶⁷⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁷⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁷⁸<http://www.veeco.com/>

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](#)⁶⁷⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the latest Bio-Formats 5.0.x version⁶⁸⁰ or the previous versions⁶⁸¹ page to find documentation for the version you are using.

17.126 Trestle

Extensions: .tif, .sld, .jpg

Support

BSD-licensed: ❌

Export: ❌

Officially Supported Versions:

Supported Metadata Fields: *Trestle*

Sample Datasets:

- [OpenSlide](#)⁶⁸²

We currently have:

- a few example datasets
- [developer documentation from the OpenSlide project](#)⁶⁸³

⁶⁷⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/TopometrixReader.java>

⁶⁸⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁶⁸¹<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁸²<http://openslide.cs.cmu.edu/download/openslide-testdata/Trestle/>


⁶⁸³<http://openslide.org/Trestle%20format/>


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [TrestleReader.java](#)⁶⁸⁴


Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁸⁵ or the [previous versions](#)⁶⁸⁶ page to find documentation for the version you are using.

17.127 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: 

Additional Information

Source Code: [UBMReader.java](#)⁶⁸⁷

Notes:

⁶⁸⁴<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/TrestleReader.java>

⁶⁸⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁸⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁸⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/UBMReader.java>


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁶⁸⁸](#) or the [previous versions⁶⁸⁹](#) page to find documentation for the version you are using.

17.128 Unisoku

Extensions: .dat, .hdr

Owner: [Unisoku⁶⁹⁰](#)

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.java⁶⁹¹](#)

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version⁶⁹²](#) or the [previous versions⁶⁹³](#) page to find documentation for the version you are using.

17.129 Varian FDF

Extensions: .fdf

Developer: [Varian, Inc.⁶⁹⁴](#)

Support

⁶⁸⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁸⁹<http://www.openmicroscopy.org/site/support/legacy/>


⁶⁹⁰<http://www.unisoku.com>

⁶⁹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/UnisokuReader.java>

⁶⁹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁹³<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁹⁴<http://www.varianinc.com>

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](#)⁶⁹⁵

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁶⁹⁶ or the [previous versions](#)⁶⁹⁷ page to find documentation for the version you are using.

17.130 Veeco AFM

Extensions: .hdf

Developer: [Veeco](#)⁶⁹⁸

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Veeco AFM*

We currently have:

- a few sample datasets

We would like to have:

Ratings

Pixels: 




Metadata: 

⁶⁹⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VarianFDFReader.java>

⁶⁹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁹⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁹⁸<http://www.veeco.com>


Openness: Presence: Utility: **Additional Information**Source Code: [VeecoReader.java](#)⁶⁹⁹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁰⁰ or the [previous versions](#)⁷⁰¹ page to find documentation for the version you are using.

17.131 VG SAM

Extensions: .dti

SupportBSD-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

RatingsPixels: Metadata: Openness: Presence: Utility: **Additional Information**Source Code: [VGSAMReader.java](#)⁷⁰²

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁰³ or the [previous versions](#)⁷⁰⁴ page to find documentation for the version you are using.


⁶⁹⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VeecoReader.java>⁷⁰⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁷⁰¹<http://www.openmicroscopy.org/site/support/legacy/>⁷⁰²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VGSAMReader.java>⁷⁰³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>⁷⁰⁴<http://www.openmicroscopy.org/site/support/legacy/>

17.132 VisiTech XYS

Extensions: .xys, .html

Developer: [VisiTech International](#)⁷⁰⁵

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](#)⁷⁰⁶

Notes:


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁰⁷ or the [previous versions](#)⁷⁰⁸ page to find documentation for the version you are using.

17.133 Volocity

Extensions: .mvd2

Developer: [PerkinElmer](#)⁷⁰⁹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Volocity*

Sample Datasets:

- [PerkinElmer Downloads](#)⁷¹⁰

⁷⁰⁵<http://www.visitech.co.uk/>

⁷⁰⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VisitechReader.java>

⁷⁰⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁰⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁰⁹<http://www.perkinelmer.com/pages/020/cellularimaging/products/volocity.xhtml>

⁷¹⁰<http://cellularimaging.perkinelmer.com/downloads/>


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](#)⁷¹¹

Notes:

.mvd2 files are [Metakit database files](#)⁷¹².

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷¹³ or the [previous versions](#)⁷¹⁴ page to find documentation for the version you are using.

17.134 Volocity Library Clipping

Extensions: .acff

Developer: [PerkinElmer](#)⁷¹⁵

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

Ratings

Pixels: 

Metadata: 

Openness: 


⁷¹¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VolocityReader.java>


⁷¹²<http://equi4.com/metakit/>

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>

Presence: 

Utility: 

Additional Information

Source Code: [VolocityClippingReader.java](#)⁷¹⁶

Notes:

RGB .acff files are not yet supported. See [#6413](#)⁷¹⁷.

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷¹⁸ or the [previous versions](#)⁷¹⁹ page to find documentation for the version you are using.


17.135 WA-TOP

Extensions: .wat

Developer: WA Technology

Owner: [Oxford Instruments](#)⁷²⁰

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


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [WATOPReader.java](#)⁷²¹

Notes:

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷²² or the [previous](#)

⁷¹⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/VolocityClippingReader.java>

⁷¹⁷<http://trac.openmicroscopy.org.uk/ome/ticket/6413>

⁷¹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷¹⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁷²⁰<http://www.oxinst.com>

⁷²¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/WATOPReader.java>

[versions](#)⁷²³ page to find documentation for the version you are using.

17.136 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](#)⁷²⁴

We currently have:

- many BMP datasets

We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [BMPReader.java](#)⁷²⁵

Notes:

Compressed BMP files are currently not supported.

See also:

[Technical Overview](#)⁷²⁶

Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷²⁷ or the [previous versions](#)⁷²⁸ page to find documentation for the version you are using.

17.137 Woolz

Extensions: .wlz

Developer: [MRC Human Genetics Unit](#)⁷²⁹

⁷²²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷²³<http://www.openmicroscopy.org/site/support/legacy/>

⁷²⁴<http://rsb.info.nih.gov/ij/plugins/bmp-writer.html>

⁷²⁵<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-bsd/src/loci/formats/in/BMPReader.java>


⁷²⁶<http://www.faqs.org/faqs/graphics/fileformats-faq/part3/section-18.html>

⁷²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷²⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁷²⁹http://www.emouseatlas.org/emap/analysis_tools_resources/software/woolz.html

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Woolz*

Freely Available Software:


- *Woolz*⁷³⁰

We currently have:


- a few *Woolz* datasets


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: *WlzReader.java*⁷³¹ Source Code: *WlzWriter.java*⁷³²

Notes:

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.

17.138 Zeiss Axio CSM

Extensions: .lms

Developer: *Carl Zeiss Microscopy GmbH*⁷³⁵

Owner: *Carl Zeiss Microscopy GmbH*⁷³⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Zeiss Axio CSM*

We currently have:

- one example dataset

⁷³⁰http://www.emouseatlas.org/emap/analysis_tools_resources/software/woolz.html

⁷³¹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/WlzReader.java>

⁷³²<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/out/WlzWriter.java>

⁷³³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>


⁷³⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁷³⁵<http://www.zeiss.com/microscopy/>


⁷³⁶<http://www.zeiss.com/microscopy/>


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [ZeissLMSReader.java](https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissLMSReader.java)⁷³⁷

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](#)⁷³⁸ or the [previous versions](#)⁷³⁹ page to find documentation for the version you are using.


17.139 Zeiss AxioVision TIFF

Extensions: .xml, .tiff

Developer: [Carl Zeiss Microscopy GmbH](#)⁷⁴⁰

Owner: [Carl Zeiss Microscopy GmbH](#)⁷⁴¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Zeiss AxioVision TIFF*

Freely Available Software:

- [Zeiss ZEN Lite](#)⁷⁴²


We currently have:

- many example datasets


We would like to have:

- an official specification document

Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

⁷³⁷<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissLMSReader.java>


⁷³⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷³⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁴⁰<http://www.zeiss.com/microscopy/>

⁷⁴¹<http://www.zeiss.com/microscopy/>

⁷⁴²http://www.zeiss.com/microscopy/en_de/products/microscope-software/zen-lite.html

Utility: 

Additional Information

Source Code: [ZeissTIFFReader.java](#)⁷⁴³

Notes:

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 ZVI (Zeiss Vision Image)

Extensions: .zvi

Developer: [Carl Zeiss Microscopy GmbH \(AxioVision\)](#)⁷⁴⁶

Owner: [Carl Zeiss Microscopy GmbH](#)⁷⁴⁷

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](#)⁷⁴⁸

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:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [ZeissZVIReader.java](#)⁷⁴⁹

⁷⁴³<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissTIFFReader.java>

⁷⁴⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁴⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁴⁶http://www.zeiss.com/microscopy/en_de/products/microscope-software/axiovision-for-biology.html

⁷⁴⁷<http://www.zeiss.com/microscopy/>

⁷⁴⁸http://www.zeiss.com/microscopy/en_de/downloads/axiovision.html

⁷⁴⁹<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissZVIReader.java>

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](#)⁷⁵⁰ 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](#)⁷⁵¹.

See also:

[Axiovision software overview](#)⁷⁵²


Note: This documentation is for the new Bio-Formats 5.1 version. See the [latest Bio-Formats 5.0.x version](#)⁷⁵³ or the [previous versions](#)⁷⁵⁴ page to find documentation for the version you are using.

17.141 Zeiss CZI

Extensions: `.czi`⁷⁵⁵

Developer: [Carl Zeiss Microscopy GmbH](#)⁷⁵⁶

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Zeiss CZI*

Freely Available Software:


- [Zeiss ZEN](#)⁷⁵⁷

We currently have:

- many example datasets
- official specification documents


We would like to have:


Ratings

Pixels: 

Metadata: 

Openness: 

Presence: 

Utility: 

Additional Information

Source Code: [ZeissCZIReader.java](#)⁷⁵⁸

Notes:

⁷⁵⁰<http://jakarta.apache.org/poi/>

⁷⁵¹<http://www.bitplane.com/>

⁷⁵²http://www.zeiss.com/microscopy/en_de/products/microscope-software/axiovision-for-biology.html

⁷⁵³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁵⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁵⁵<http://www.zeiss.com/czi>

⁷⁵⁶<http://www.zeiss.com/czi>

⁷⁵⁷http://www.zeiss.com/microscopy/en_de/products/microscope-software/zen.html

⁷⁵⁸<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissCZIReader.java>

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 version⁷⁵⁹ or the previous versions⁷⁶⁰ page to find documentation for the version you are using.

17.142 Zeiss LSM (Laser Scanning Microscope) 510/710

Extensions: .lsm, .mdb

Owner: Carl Zeiss Microscopy GmbH⁷⁶¹

Support

BSD-licensed: 

Export: 

Officially Supported Versions:

Supported Metadata Fields: *Zeiss LSM (Laser Scanning Microscope) 510/710*

Freely Available Software:


- Zeiss LSM Image Browser⁷⁶²
- LSM Toolbox plugin for ImageJ⁷⁶³
- LSM Reader plugin for ImageJ⁷⁶⁴
- DIMIN⁷⁶⁵

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

Source Code: [ZeissLSMReader.java](#)⁷⁶⁶

Notes:

Please note that while we have specification documents for this format, we are not able to distribute them to third parties.

⁷⁵⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁶⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁶¹<http://www.zeiss.com/microscopy/>

⁷⁶²http://www.zeiss.com/microscopy/en_de/downloads/lsm-5-series.html

⁷⁶³<http://imagejdocu.tudor.lu/Members/ppirrotte/lsmtoolbox>

⁷⁶⁴<http://rsb.info.nih.gov/ij/plugins/lsm-reader.html>

⁷⁶⁵<http://www.dimin.net/>

⁷⁶⁶<https://github.com/openmicroscopy/bioformats/blob/develop/components/formats-gpl/src/loci/formats/in/ZeissLSMReader.java>

Bio-Formats uses the [MDB Tools Java port](http://mdbtools.sourceforge.net/)⁷⁶⁷

Commercial applications that support this format include:

- [SVI Huygens](http://www2.svi.nl/)⁷⁶⁸
- [Bitplane Imaris](http://www.bitplane.com/)⁷⁶⁹
- [Amira](http://www.amira.com/)⁷⁷⁰
- [Image-Pro Plus](http://www.mediacy.com/)⁷⁷¹

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/)⁷⁷² or the [previous versions](http://www.openmicroscopy.org/site/support/legacy/)⁷⁷³ page to find documentation for the version you are using.

⁷⁶⁷<http://mdbtools.sourceforge.net/>

⁷⁶⁸<http://www2.svi.nl/>

⁷⁶⁹<http://www.bitplane.com/>

⁷⁷⁰<http://www.amira.com/>

⁷⁷¹<http://www.mediacy.com/>

⁷⁷²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁷³<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
<i>GatanDM2Reader</i>	30	0	0	445

Continued on next page

Table 18.1 – continued from previous page

Format	Supported	Unsupported	Partial	Unknown/Missing
<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>LiFImReader</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
<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

Continued on next page

Table 18.1 – continued from previous page

Format	Supported	Unsupported	Partial	Unknown/Missing
<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>PCIReader</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>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>TiffJAIReader</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
<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

Continued on next page

Table 18.1 – continued from previous page

Format	Supported	Unsupported	Partial	Unknown/Missing
<i>VelocityReader</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	167
Arc - LotNumber ²	1	0	0	166
Arc - Manufacturer ³	1	0	0	166
Arc - Model ⁴	1	0	0	166
Arc - Power ⁵	1	0	0	166
Arc - SerialNumber ⁶	1	0	0	166
Arc - Type ⁷	0	0	0	167
BooleanAnnotation - AnnotationRef ⁸	0	0	0	167
BooleanAnnotation - Description ⁹	0	0	0	167
BooleanAnnotation - ID ¹⁰	1	0	0	166
BooleanAnnotation - Namespace ¹¹	1	0	0	166
BooleanAnnotation - Value ¹²	1	0	0	166
Channel - AcquisitionMode ¹³	4	0	0	163
Channel - AnnotationRef ¹⁴	0	0	0	167
Channel - Color ¹⁵	8	0	0	159
Channel - Contrast-Method ¹⁶	0	0	0	167
Channel - Emission-Wavelength ¹⁷	18	0	0	149
Channel - Excitation-Wavelength ¹⁸	17	0	0	150

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¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Arc_Type⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Description¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_ID¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#Annotation_Namespace¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#BooleanAnnotation_Value¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_AcquisitionMode¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID¹⁵http://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_ExcitationWavelength

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Channel - FilterSetRef ¹⁹	1	0	0	166
Channel - Fluor ²⁰	1	0	0	166
Channel - ID ²¹	167	0	0	0
Channel - IlluminationType ²²	3	0	0	164
Channel - LightSourceSettingsAttenuation ²³	1	0	0	166
Channel - LightSourceSettingsID ²⁴	5	0	0	162
Channel - LightSourceSettingsWavelength ²⁵	2	0	0	165
Channel - NDFilter ²⁶	2	0	0	165
Channel - Name ²⁷	33	0	0	134
Channel - PinholeSize ²⁸	10	0	0	157
Channel - PockelCellSetting ²⁹	0	0	0	167
Channel - SamplesPerPixel ³⁰	167	0	0	0
CommentAnnotation - AnnotationRef ³¹	0	0	0	167
CommentAnnotation - Description ³²	0	0	0	167
CommentAnnotation - ID ³³	1	0	0	166
CommentAnnotation - Namespace ³⁴	1	0	0	166
CommentAnnotation - Value ³⁵	1	0	0	166
Dataset - AnnotationRef ³⁶	0	0	0	167
Dataset - Description ³⁷	0	0	0	167
Dataset - ExperimenterGroupRef ³⁸	0	0	0	167
Dataset - ExperimenterRef ³⁹	0	0	0	167

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¹⁹http://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_Value³⁶http://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_ID

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Dataset - ID ⁴⁰	0	0	0	167
Dataset - ImageRef ⁴¹	0	0	0	167
Dataset - Name ⁴²	0	0	0	167
Detector - AmplificationGain ⁴³	2	0	0	165
Detector - Gain ⁴⁴	6	0	0	161
Detector - ID ⁴⁵	35	0	0	132
Detector - LotNumber ⁴⁶	1	0	0	166
Detector - Manufacturer ⁴⁷	5	0	0	162
Detector - Model ⁴⁸	14	0	0	153
Detector - Offset ⁴⁹	6	0	0	161
Detector - SerialNumber ⁵⁰	4	0	0	163
Detector - Type ⁵¹	28	0	0	139
Detector - Voltage ⁵²	2	0	0	165
Detector - Zoom ⁵³	4	0	0	163
DetectorSettings - Binning ⁵⁴	18	0	0	149
DetectorSettings - Gain ⁵⁵	20	0	0	147
DetectorSettings - ID ⁵⁶	33	0	0	134
DetectorSettings - Offset ⁵⁷	9	0	0	158
DetectorSettings - ReadOutRate ⁵⁸	5	0	0	162
DetectorSettings - Voltage ⁵⁹	6	0	0	161
Dichroic - ID ⁶⁰	6	0	0	161
Dichroic - LotNumber ⁶¹	1	0	0	166
Dichroic - Manufacturer ⁶²	1	0	0	166
Dichroic - Model ⁶³	6	0	0	161

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⁴⁰http://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_ReadOutRate⁵⁹http://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_Model

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Dichroic - Serial-Number ⁶⁴	1	0	0	166
DoubleAnnotation - AnnotationRef ⁶⁵	0	0	0	167
DoubleAnnotation - Description ⁶⁶	0	0	0	167
DoubleAnnotation - ID ⁶⁷	1	0	0	166
DoubleAnnotation - Namespace ⁶⁸	1	0	0	166
DoubleAnnotation - Value ⁶⁹	1	0	0	166
Ellipse - FillColor ⁷⁰	0	0	0	167
Ellipse - FillRule ⁷¹	0	0	0	167
Ellipse - FontFamily ⁷²	0	0	0	167
Ellipse - FontSize ⁷³	2	0	0	165
Ellipse - FontStyle ⁷⁴	0	0	0	167
Ellipse - ID ⁷⁵	5	0	0	162
Ellipse - LineCap ⁷⁶	0	0	0	167
Ellipse - Locked ⁷⁷	0	0	0	167
Ellipse - RadiusX ⁷⁸	5	0	0	162
Ellipse - RadiusY ⁷⁹	5	0	0	162
Ellipse - StrokeColor ⁸⁰	0	0	0	167
Ellipse - StrokeDashArray ⁸¹	0	0	0	167
Ellipse - StrokeWidth ⁸²	2	0	0	165
Ellipse - Text ⁸³	3	0	0	164
Ellipse - TheC ⁸⁴	0	0	0	167
Ellipse - TheT ⁸⁵	2	0	0	165
Ellipse - TheZ ⁸⁶	2	0	0	165
Ellipse - Transform ⁸⁷	2	0	0	165
Ellipse - Visible ⁸⁸	0	0	0	167
Ellipse - X ⁸⁹	5	0	0	162

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⁶⁴http://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_StrokeDashArray⁸²http://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_X

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Ellipse - Y ⁹⁰	5	0	0	162
Experiment - Description ⁹¹	1	0	0	166
Experiment - ExperimentRef ⁹²	0	0	0	167
Experiment - ID ⁹³	5	0	0	162
Experiment - Type ⁹⁴	5	0	0	162
Experimenter - AnnotationRef ⁹⁵	0	0	0	167
Experimenter - Email ⁹⁶	2	0	0	165
Experimenter - First-Name ⁹⁷	5	0	0	162
Experimenter - ID ⁹⁸	11	0	0	156
Experimenter - Institution ⁹⁹	4	0	0	163
Experimenter - Last-Name ¹⁰⁰	9	0	0	158
Experimenter - MiddleName ¹⁰¹	1	0	0	166
Experimenter - UserName ¹⁰²	3	0	0	164
ExperimenterGroup - AnnotationRef ¹⁰³	0	0	0	167
ExperimenterGroup - Description ¹⁰⁴	0	0	0	167
ExperimenterGroup - ExperimentRef ¹⁰⁵	0	0	0	167
ExperimenterGroup - ID ¹⁰⁶	0	0	0	167
ExperimenterGroup - Leader ¹⁰⁷	0	0	0	167
ExperimenterGroup - Name ¹⁰⁸	0	0	0	167
Filament - ID ¹⁰⁹	0	0	0	167
Filament - LotNumber ¹¹⁰	1	0	0	166
Filament - Manufacturer ¹¹¹	1	0	0	166

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⁹⁰http://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#ExperimentRef_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_Description¹⁰⁵http://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_Manufacturer

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Filament - Model ¹¹²	1	0	0	166
Filament - Power ¹¹³	1	0	0	166
Filament - Serial- Number ¹¹⁴	1	0	0	166
Filament - Type ¹¹⁵	0	0	0	167
FileAnnotation - An- notationRef ¹¹⁶	0	0	0	167
FileAnnotation - De- scription ¹¹⁷	0	0	0	167
FileAnnotation - ID ¹¹⁸	0	0	0	167
FileAnnotation - Namespace ¹¹⁹	0	0	0	167
Filter - Filter- Wheel ¹²⁰	2	0	0	165
Filter - ID ¹²¹	8	0	0	159
Filter - LotNum- ber ¹²²	1	0	0	166
Filter - Manufac- turer ¹²³	1	0	0	166
Filter - Model ¹²⁴	8	0	0	159
Filter - SerialNum- ber ¹²⁵	1	0	0	166
Filter - Type ¹²⁶	2	0	0	165
FilterSet - DichroicRef ¹²⁷	2	0	0	165
FilterSet - Emission- FilterRef ¹²⁸	2	0	0	165
FilterSet - Excita- tionFilterRef ¹²⁹	2	0	0	165
FilterSet - ID ¹³⁰	2	0	0	165
FilterSet - LotNum- ber ¹³¹	1	0	0	166
FilterSet - Manufac- turer ¹³²	1	0	0	166
FilterSet - Model ¹³³	2	0	0	165
FilterSet - Serial- Number ¹³⁴	1	0	0	166

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¹¹²http://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_Type¹²⁷http://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_SerialNumber

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Image - Acquisition-Date ¹³⁵	167	0	0	0
Image - Annotation-Ref ¹³⁶	1	0	0	166
Image - Description ¹³⁷	44	0	0	123
Image - ExperimentRef ¹³⁸	2	0	0	165
Image - ExperimenterGroupRef ¹³⁹	0	0	0	167
Image - ExperimenterRef ¹⁴⁰	6	0	0	161
Image - ID ¹⁴¹	167	0	0	0
Image - InstrumentRef ¹⁴²	45	0	0	122
Image - Microbeam-ManipulationRef ¹⁴³	0	0	0	167
Image - Name ¹⁴⁴	167	0	0	0
Image - ROIRef ¹⁴⁵	12	0	0	155
ImagingEnvironment - AirPressure ¹⁴⁶	1	0	0	166
ImagingEnvironment - CO2Percent ¹⁴⁷	1	0	0	166
ImagingEnvironment - Humidity ¹⁴⁸	1	0	0	166
ImagingEnvironment - Temperature ¹⁴⁹	10	0	0	157
Instrument - ID ¹⁵⁰	51	0	0	116
Label - FillColor ¹⁵¹	0	0	0	167
Label - FillRule ¹⁵²	0	0	0	167
Label - FontFamily ¹⁵³	0	0	0	167
Label - FontSize ¹⁵⁴	2	0	0	165
Label - FontStyle ¹⁵⁵	0	0	0	167
Label - ID ¹⁵⁶	3	0	0	164
Label - LineCap ¹⁵⁷	0	0	0	167
Label - Locked ¹⁵⁸	0	0	0	167

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¹³⁵http://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_CO2Percent¹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Humidity¹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature¹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID¹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor¹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule¹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontFamily¹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize¹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontStyle¹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID¹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_LineCap¹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Locked

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Field	Supported	Unsupported	Partial	Unknown/Missing
Label - Stroke-Color ¹⁵⁹	0	0	0	167
Label - StrokeDashArray ¹⁶⁰	0	0	0	167
Label - StrokeWidth ¹⁶¹	2	0	0	165
Label - Text ¹⁶²	3	0	0	164
Label - TheC ¹⁶³	0	0	0	167
Label - TheT ¹⁶⁴	0	0	0	167
Label - TheZ ¹⁶⁵	0	0	0	167
Label - Transform ¹⁶⁶	0	0	0	167
Label - Visible ¹⁶⁷	0	0	0	167
Label - X ¹⁶⁸	3	0	0	164
Label - Y ¹⁶⁹	3	0	0	164
Laser - Frequency-Multiplication ¹⁷⁰	0	0	0	167
Laser - ID ¹⁷¹	9	0	0	158
Laser - Laser-Medium ¹⁷²	8	0	0	159
Laser - LotNumber ¹⁷³	1	0	0	166
Laser - Manufacturer ¹⁷⁴	2	0	0	165
Laser - Model ¹⁷⁵	4	0	0	163
Laser - PockelCell ¹⁷⁶	0	0	0	167
Laser - Power ¹⁷⁷	3	0	0	164
Laser - Pulse ¹⁷⁸	0	0	0	167
Laser - Pump ¹⁷⁹	0	0	0	167
Laser - Repetition-Rate ¹⁸⁰	1	0	0	166
Laser - SerialNumber ¹⁸¹	1	0	0	166
Laser - Tuneable ¹⁸²	0	0	0	167
Laser - Type ¹⁸³	8	0	0	159
Laser - Wavelength ¹⁸⁴	7	0	0	160

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¹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor¹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray¹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth¹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text¹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC¹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT¹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ¹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform¹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Visible¹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_X¹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_Y¹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_FrequencyMultiplication¹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID¹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium¹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber¹⁷⁴http://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_Wavelength

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Field	Supported	Unsupported	Partial	Unknown/Missing
LightEmittingDiode - ID ¹⁸⁵	0	0	0	167
LightEmittingDiode - LotNumber ¹⁸⁶	1	0	0	166
LightEmittingDiode - Manufacturer ¹⁸⁷	1	0	0	166
LightEmittingDiode - Model ¹⁸⁸	1	0	0	166
LightEmittingDiode - Power ¹⁸⁹	1	0	0	166
LightEmittingDiode - SerialNumber ¹⁹⁰	1	0	0	166
LightPath - DichroicRef ¹⁹¹	3	0	0	164
LightPath - EmissionFilterRef ¹⁹²	5	0	0	162
LightPath - ExcitationFilterRef ¹⁹³	1	0	0	166
Line - FillColor ¹⁹⁴	0	0	0	167
Line - FillRule ¹⁹⁵	0	0	0	167
Line - FontFamily ¹⁹⁶	0	0	0	167
Line - FontSize ¹⁹⁷	2	0	0	165
Line - FontStyle ¹⁹⁸	0	0	0	167
Line - ID ¹⁹⁹	5	0	0	162
Line - LineCap ²⁰⁰	0	0	0	167
Line - Locked ²⁰¹	0	0	0	167
Line - MarkerEnd ²⁰²	0	0	0	167
Line - MarkerStart ²⁰³	0	0	0	167
Line - StrokeColor ²⁰⁴	0	0	0	167
Line - StrokeDashArray ²⁰⁵	0	0	0	167
Line - StrokeWidth ²⁰⁶	2	0	0	165
Line - Text ²⁰⁷	2	0	0	165
Line - TheC ²⁰⁸	0	0	0	167
Line - TheT ²⁰⁹	1	0	0	166

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¹⁸⁵http://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_FontFamily¹⁹⁷http://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_TheT

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Line - TheZ ²¹⁰	1	0	0	166
Line - Transform ²¹¹	1	0	0	166
Line - Visible ²¹²	0	0	0	167
Line - X1 ²¹³	5	0	0	162
Line - X2 ²¹⁴	5	0	0	162
Line - Y1 ²¹⁵	5	0	0	162
Line - Y2 ²¹⁶	5	0	0	162
ListAnnotation - AnnotationRef ²¹⁷	0	0	0	167
ListAnnotation - Description ²¹⁸	0	0	0	167
ListAnnotation - ID ²¹⁹	0	0	0	167
ListAnnotation - Namespace ²²⁰	0	0	0	167
LongAnnotation - AnnotationRef ²²¹	0	0	0	167
LongAnnotation - Description ²²²	0	0	0	167
LongAnnotation - ID ²²³	1	0	0	166
LongAnnotation - Namespace ²²⁴	1	0	0	166
LongAnnotation - Value ²²⁵	1	0	0	166
Mask - FillColor ²²⁶	1	0	0	166
Mask - FillRule ²²⁷	0	0	0	167
Mask - FontFamily ²²⁸	0	0	0	167
Mask - FontSize ²²⁹	0	0	0	167
Mask - Height ²³⁰	2	0	0	165
Mask - ID ²³¹	2	0	0	165
Mask - LineCap ²³²	0	0	0	167
Mask - Locked ²³³	0	0	0	167
Mask - StrokeColor ²³⁴	1	0	0	166

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²¹⁰http://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_Description²²³http://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_StrokeColor

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Mask - StrokeDashArray ²³⁵	0	0	0	167
Mask - StrokeWidth ²³⁶	0	0	0	167
Mask - Text ²³⁷	0	0	0	167
Mask - TheC ²³⁸	0	0	0	167
Mask - TheT ²³⁹	0	0	0	167
Mask - TheZ ²⁴⁰	0	0	0	167
Mask - Transform ²⁴¹	0	0	0	167
Mask - Visible ²⁴²	0	0	0	167
Mask - Width ²⁴³	2	0	0	165
Mask - X ²⁴⁴	2	0	0	165
Mask - Y ²⁴⁵	2	0	0	165
MicrobeamManipulation - ExperimenterRef ²⁴⁶	0	0	0	167
MicrobeamManipulation - ID ²⁴⁷	0	0	0	167
MicrobeamManipulation - ROIRef ²⁴⁸	0	0	0	167
MicrobeamManipulation - Type ²⁴⁹	0	0	0	167
MicrobeamManipulationLightSourceSettings - Attenuation ²⁵⁰	0	0	0	167
MicrobeamManipulationLightSourceSettings - ID ²⁵¹	0	0	0	167
MicrobeamManipulationLightSourceSettings - Wavelength ²⁵²	0	0	0	167
Microscope - Lot-Number ²⁵³	1	0	0	166
Microscope - Manufacturer ²⁵⁴	2	0	0	165
Microscope - Model ²⁵⁵	12	0	0	155
Microscope - Serial-Number ²⁵⁶	4	0	0	163
Microscope - Type ²⁵⁷	3	0	0	164
Objective - CalibratedMagnification ²⁵⁸	9	0	0	158

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²³⁵http://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_ID²⁴⁸http://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_CalibratedMagnification

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Objective - Correction ²⁵⁹	25	0	0	142
Objective - ID ²⁶⁰	37	0	0	130
Objective - Immersion ²⁶¹	26	0	0	141
Objective - Iris ²⁶²	2	0	0	165
Objective - LensNA ²⁶³	21	0	0	146
Objective - LotNumber ²⁶⁴	1	0	0	166
Objective - Manufacturer ²⁶⁵	5	0	0	162
Objective - Model ²⁶⁶	13	0	0	154
Objective - NominalMagnification ²⁶⁷	28	0	0	139
Objective - SerialNumber ²⁶⁸	3	0	0	164
Objective - WorkingDistance ²⁶⁹	10	0	0	157
ObjectiveSettings - CorrectionCollar ²⁷⁰	1	0	0	166
ObjectiveSettings - ID ²⁷¹	32	0	0	135
ObjectiveSettings - Medium ²⁷²	1	0	0	166
ObjectiveSettings - RefractiveIndex ²⁷³	8	0	0	159
Pixels - AnnotationRef ²⁷⁴	0	0	0	167
Pixels - BigEndian ²⁷⁵	167	0	0	0
Pixels - DimensionOrder ²⁷⁶	167	0	0	0
Pixels - ID ²⁷⁷	167	0	0	0
Pixels - Interleaved ²⁷⁸	167	0	0	0
Pixels - PhysicalSizeX ²⁷⁹	87	0	0	80
Pixels - PhysicalSizeY ²⁸⁰	87	0	0	80

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²⁵⁹http://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_SerialNumber²⁶⁹http://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_PhysicalSizeY

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Field	Supported	Unsupported	Partial	Unknown/Missing
Pixels - Physical-SizeZ ²⁸¹	43	0	0	124
Pixels - Significant-Bits ²⁸²	167	0	0	0
Pixels - SizeC ²⁸³	167	0	0	0
Pixels - SizeT ²⁸⁴	167	0	0	0
Pixels - SizeX ²⁸⁵	167	0	0	0
Pixels - SizeY ²⁸⁶	167	0	0	0
Pixels - SizeZ ²⁸⁷	167	0	0	0
Pixels - TimeIncrement ²⁸⁸	16	0	0	151
Pixels - Type ²⁸⁹	167	0	0	0
Plane - Annotation-Ref ²⁹⁰	0	0	0	167
Plane - DeltaT ²⁹¹	24	0	0	143
Plane - Exposure-Time ²⁹²	31	0	0	136
Plane - HashSHA1 ²⁹³	0	0	0	167
Plane - PositionX ²⁹⁴	28	0	0	139
Plane - PositionY ²⁹⁵	28	0	0	139
Plane - PositionZ ²⁹⁶	21	0	0	146
Plane - TheC ²⁹⁷	167	0	0	0
Plane - TheT ²⁹⁸	167	0	0	0
Plane - TheZ ²⁹⁹	167	0	0	0
Plate - Annotation-Ref ³⁰⁰	0	0	0	167
Plate - ColumnNamingConvention ³⁰¹	8	0	0	159
Plate - Columns ³⁰²	4	0	0	163
Plate - Description ³⁰³	2	0	0	165
Plate - ExternalIdentifier ³⁰⁴	3	0	0	164
Plate - ID ³⁰⁵	10	0	0	157
Plate - Name ³⁰⁶	9	0	0	158

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²⁸¹http://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_DeltaT²⁹²http://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_Name

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Field	Supported	Unsupported	Partial	Unknown/Missing
Plate - RowNaming-Convention ³⁰⁷	8	0	0	159
Plate - Rows ³⁰⁸	4	0	0	163
Plate - Status ³⁰⁹	0	0	0	167
Plate - WellOriginX ³¹⁰	1	0	0	166
Plate - WellOriginY ³¹¹	1	0	0	166
PlateAcquisition - AnnotationRef ³¹²	0	0	0	167
PlateAcquisition - Description ³¹³	0	0	0	167
PlateAcquisition - EndTime ³¹⁴	2	0	0	165
PlateAcquisition - ID ³¹⁵	8	0	0	159
PlateAcquisition - MaximumFieldCount ³¹⁶	8	0	0	159
PlateAcquisition - Name ³¹⁷	0	0	0	167
PlateAcquisition - StartTime ³¹⁸	3	0	0	164
PlateAcquisition - WellSampleRef ³¹⁹	7	0	0	160
Point - FillColor ³²⁰	0	0	0	167
Point - FillRule ³²¹	0	0	0	167
Point - FontFamily ³²²	0	0	0	167
Point - FontSize ³²³	1	0	0	166
Point - FontStyle ³²⁴	0	0	0	167
Point - ID ³²⁵	3	0	0	164
Point - LineCap ³²⁶	0	0	0	167
Point - Locked ³²⁷	0	0	0	167
Point - StrokeColor ³²⁸	1	0	0	166
Point - StrokeDashArray ³²⁹	1	0	0	166

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³⁰⁷http://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_ID³¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount³¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_Name³¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_StartTime³¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID³²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor³²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule³²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontFamily³²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize³²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontStyle³²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID³²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_LineCap³²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Locked³²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor³²⁹http://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
Point -	2	0	0	165
StrokeWidth ³³⁰				
Point - Text ³³¹	1	0	0	166
Point - TheC ³³²	0	0	0	167
Point - TheT ³³³	1	0	0	166
Point - TheZ ³³⁴	2	0	0	165
Point - Transform ³³⁵	0	0	0	167
Point - Visible ³³⁶	0	0	0	167
Point - X ³³⁷	3	0	0	164
Point - Y ³³⁸	3	0	0	164
Polygon - Fill-Color ³³⁹	0	0	0	167
Polygon - FillRule ³⁴⁰	0	0	0	167
Polygon - FontFamily ³⁴¹	0	0	0	167
Polygon - FontSize ³⁴²	2	0	0	165
Polygon - FontStyle ³⁴³	0	0	0	167
Polygon - ID ³⁴⁴	7	0	0	160
Polygon - LineCap ³⁴⁵	0	0	0	167
Polygon - Locked ³⁴⁶	0	0	0	167
Polygon - Points ³⁴⁷	7	0	0	160
Polygon - StrokeColor ³⁴⁸	1	0	0	166
Polygon - StrokeDashArray ³⁴⁹	1	0	0	166
Polygon - StrokeWidth ³⁵⁰	3	0	0	164
Polygon - Text ³⁵¹	2	0	0	165
Polygon - TheC ³⁵²	0	0	0	167
Polygon - TheT ³⁵³	1	0	0	166
Polygon - TheZ ³⁵⁴	2	0	0	165
Polygon - Transform ³⁵⁵	1	0	0	166

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³³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth³³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text³³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC³³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT³³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ³³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform³³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Visible³³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_X³³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_Y³³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor³⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillRule³⁴¹http://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_Transform

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Polygon - Visible ³⁵⁶	0	0	0	167
Polyline - Fill-Color ³⁵⁷	0	0	0	167
Polyline - FillRule ³⁵⁸	0	0	0	167
Polyline - FontFamily ³⁵⁹	0	0	0	167
Polyline - FontSize ³⁶⁰	2	0	0	165
Polyline - FontStyle ³⁶¹	0	0	0	167
Polyline - ID ³⁶²	5	0	0	162
Polyline - LineCap ³⁶³	0	0	0	167
Polyline - Locked ³⁶⁴	0	0	0	167
Polyline - MarkerEnd ³⁶⁵	0	0	0	167
Polyline - MarkerStart ³⁶⁶	0	0	0	167
Polyline - Points ³⁶⁷	5	0	0	162
Polyline - StrokeColor ³⁶⁸	1	0	0	166
Polyline - StrokeDashArray ³⁶⁹	1	0	0	166
Polyline - StrokeWidth ³⁷⁰	3	0	0	164
Polyline - Text ³⁷¹	2	0	0	165
Polyline - TheC ³⁷²	0	0	0	167
Polyline - TheT ³⁷³	1	0	0	166
Polyline - TheZ ³⁷⁴	2	0	0	165
Polyline - Transform ³⁷⁵	1	0	0	166
Polyline - Visible ³⁷⁶	0	0	0	167
Project - AnnotationRef ³⁷⁷	0	0	0	167
Project - DatasetRef ³⁷⁸	0	0	0	167
Project - Description ³⁷⁹	0	0	0	167

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³⁵⁶http://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_Locked³⁶⁵http://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_Description

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Project - ExperimenterGroupRef ³⁸⁰	0	0	0	167
Project - ExperimenterRef ³⁸¹	0	0	0	167
Project - ID ³⁸²	0	0	0	167
Project - Name ³⁸³	0	0	0	167
ROI - AnnotationRef ³⁸⁴	0	0	0	167
ROI - Description ³⁸⁵	1	0	0	166
ROI - ID ³⁸⁶	12	0	0	155
ROI - Name ³⁸⁷	4	0	0	163
ROI - Namespace ³⁸⁸	0	0	0	167
Reagent - AnnotationRef ³⁸⁹	0	0	0	167
Reagent - Description ³⁹⁰	0	0	0	167
Reagent - ID ³⁹¹	0	0	0	167
Reagent - Name ³⁹²	0	0	0	167
Reagent - ReagentIdentifier ³⁹³	0	0	0	167
Rectangle - FillColor ³⁹⁴	0	0	0	167
Rectangle - FillRule ³⁹⁵	0	0	0	167
Rectangle - FontFamily ³⁹⁶	0	0	0	167
Rectangle - FontSize ³⁹⁷	2	0	0	165
Rectangle - FontStyle ³⁹⁸	0	0	0	167
Rectangle - Height ³⁹⁹	8	0	0	159
Rectangle - ID ⁴⁰⁰	8	0	0	159
Rectangle - LineCap ⁴⁰¹	0	0	0	167
Rectangle - Locked ⁴⁰²	0	0	0	167
Rectangle - StrokeColor ⁴⁰³	1	0	0	166

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³⁸⁰http://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_Namespace³⁸⁹http://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_StrokeColor

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
Rectangle - StrokeDashArray ⁴⁰⁴	0	0	0	167
Rectangle - StrokeWidth ⁴⁰⁵	2	0	0	165
Rectangle - Text ⁴⁰⁶	2	0	0	165
Rectangle - TheC ⁴⁰⁷	1	0	0	166
Rectangle - TheT ⁴⁰⁸	2	0	0	165
Rectangle - TheZ ⁴⁰⁹	2	0	0	165
Rectangle - Transform ⁴¹⁰	1	0	0	166
Rectangle - Visible ⁴¹¹	0	0	0	167
Rectangle - Width ⁴¹²	8	0	0	159
Rectangle - X ⁴¹³	8	0	0	159
Rectangle - Y ⁴¹⁴	8	0	0	159
Screen - AnnotationRef ⁴¹⁵	0	0	0	167
Screen - Description ⁴¹⁶	0	0	0	167
Screen - ID ⁴¹⁷	1	0	0	166
Screen - Name ⁴¹⁸	1	0	0	166
Screen - PlateRef ⁴¹⁹	1	0	0	166
Screen - ProtocolDescription ⁴²⁰	0	0	0	167
Screen - ProtocolIdentifier ⁴²¹	0	0	0	167
Screen - ReagentSetDescription ⁴²²	0	0	0	167
Screen - ReagentSetIdentifier ⁴²³	0	0	0	167
Screen - Type ⁴²⁴	0	0	0	167
StageLabel - Name ⁴²⁵	3	0	0	164
StageLabel - X ⁴²⁶	2	0	0	165
StageLabel - Y ⁴²⁷	2	0	0	165
StageLabel - Z ⁴²⁸	3	0	0	164

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⁴⁰⁴http://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_Transform⁴¹¹http://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_Z

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
TagAnnotation - AnnotationRef ⁴²⁹	0	0	0	167
TagAnnotation - Description ⁴³⁰	0	0	0	167
TagAnnotation - ID ⁴³¹	1	0	0	166
TagAnnotation - Namespace ⁴³²	1	0	0	166
TagAnnotation - Value ⁴³³	1	0	0	166
TermAnnotation - AnnotationRef ⁴³⁴	0	0	0	167
TermAnnotation - Description ⁴³⁵	0	0	0	167
TermAnnotation - ID ⁴³⁶	1	0	0	166
TermAnnotation - Namespace ⁴³⁷	1	0	0	166
TermAnnotation - Value ⁴³⁸	1	0	0	166
TiffData - FirstC ⁴³⁹	0	0	0	167
TiffData - FirstT ⁴⁴⁰	0	0	0	167
TiffData - FirstZ ⁴⁴¹	0	0	0	167
TiffData - IFD ⁴⁴²	0	0	0	167
TiffData - PlaneCount ⁴⁴³	0	0	0	167
TimestampAnnotation - AnnotationRef ⁴⁴⁴	0	0	0	167
TimestampAnnotation - Description ⁴⁴⁵	0	0	0	167
TimestampAnnotation - ID ⁴⁴⁶	1	0	0	166
TimestampAnnotation - Namespace ⁴⁴⁷	1	0	0	166
TimestampAnnotation - Value ⁴⁴⁸	1	0	0	166
TransmittanceRange - CutIn ⁴⁴⁹	5	0	0	162

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⁴²⁹http://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_Value⁴³⁴http://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_CutIn

Table 18.2 – continued from previous page

Field	Supported	Unsupported	Partial	Unknown/Missing
TransmittanceRange - CutInTolerance ⁴⁵⁰	1	0	0	166
TransmittanceRange - CutOut ⁴⁵¹	5	0	0	162
TransmittanceRange - CutOutTolerance ⁴⁵²	1	0	0	166
TransmittanceRange - Transmittance ⁴⁵³	1	0	0	166
UUID - FileName ⁴⁵⁴	0	0	0	167
UUID - Value ⁴⁵⁵	0	0	0	167
Well - Annotation- Ref ⁴⁵⁶	0	0	0	167
Well - Color ⁴⁵⁷	0	0	0	167
Well - Column ⁴⁵⁸	11	0	0	156
Well - ExternalDe- scription ⁴⁵⁹	0	0	0	167
Well - ExternalIden- tifier ⁴⁶⁰	0	0	0	167
Well - ID ⁴⁶¹	11	0	0	156
Well - ReagentRef ⁴⁶²	0	0	0	167
Well - Row ⁴⁶³	11	0	0	156
Well - Type ⁴⁶⁴	0	0	0	167
WellSample - Anno- tationRef ⁴⁶⁵	0	0	0	167
WellSample - ID ⁴⁶⁶	11	0	0	156
WellSample - Im- ageRef ⁴⁶⁷	10	0	0	157
WellSample - In- dex ⁴⁶⁸	11	0	0	156
WellSample - Posi- tionX ⁴⁶⁹	5	0	0	162
WellSample - Posi- tionY ⁴⁷⁰	5	0	0	162
WellSample - Time- point ⁴⁷¹	0	0	0	167
XMLAnnotation - AnnotationRef ⁴⁷²	0	0	0	167

Continued on next page

⁴⁵⁰http://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_UUID_FileName⁴⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#UniversallyUniqueIdentifier⁴⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID⁴⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Color⁴⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column⁴⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ExternalDescription⁴⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ExternalIdentifier⁴⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID⁴⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#ReagentRef_ID⁴⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row⁴⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Type⁴⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SA_xsd.html#AnnotationRef_ID⁴⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID⁴⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID⁴⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index⁴⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX⁴⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY⁴⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Timepoint⁴⁷²http://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
XMLAnnotation - ID ⁴⁷³	1	0	0	166
XMLAnnotation - Namespace ⁴⁷⁴	1	0	0	166
XMLAnnotation - Value ⁴⁷⁵	1	0	0	166

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.

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 model⁴⁷⁸. 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

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/>

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

- Objective : Correction⁴⁸⁹
- Objective : ID⁴⁹⁰
- Objective : Immersion⁴⁹¹
- Objective : Model⁴⁹²
- Objective : NominalMagnification⁴⁹³
- ObjectiveSettings : ID⁴⁹⁴
- Pixels : BigEndian⁴⁹⁵
- Pixels : DimensionOrder⁴⁹⁶
- 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](#)

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

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

versions⁵¹⁴ page to find documentation for the version you are using.

18.2.2 AIMReader

This page lists supported metadata fields for the Bio-Formats AIM format reader.

These fields are from the [OME data model](#)⁵¹⁵. 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 : ID⁵¹⁶
- Channel : SamplesPerPixel⁵¹⁷
- Image : AcquisitionDate⁵¹⁸
- Image : ID⁵¹⁹
- Image : Name⁵²⁰
- Pixels : BigEndian⁵²¹
- Pixels : DimensionOrder⁵²²
- Pixels : ID⁵²³
- Pixels : Interleaved⁵²⁴
- Pixels : PhysicalSizeX⁵²⁵
- Pixels : PhysicalSizeY⁵²⁶
- Pixels : PhysicalSizeZ⁵²⁷
- Pixels : SignificantBits⁵²⁸
- Pixels : SizeC⁵²⁹
- Pixels : SizeT⁵³⁰
- Pixels : SizeX⁵³¹

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/>

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_SamplesPerPixel

⁵¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁵¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁵²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁵²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁵²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁵²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁵²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁵²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁵²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁵²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁵²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁵²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁵³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁵³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

- Pixels : SizeY⁵³²
- Pixels : SizeZ⁵³³
- Pixels : Type⁵³⁴
- Plane : TheC⁵³⁵
- Plane : TheT⁵³⁶
- Plane : TheZ⁵³⁷

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 version⁵³⁸ or the previous versions⁵³⁹ page to find documentation for the version you are using.

18.2.3 AliconaReader

This page lists supported metadata fields for the Bio-Formats Alicona AL3D format reader.

These fields are from the OME data model⁵⁴⁰. 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 : ID⁵⁴¹
- Channel : SamplesPerPixel⁵⁴²
- Detector : ID⁵⁴³
- Detector : Type⁵⁴⁴
- DetectorSettings : ID⁵⁴⁵
- DetectorSettings : Voltage⁵⁴⁶
- Image : AcquisitionDate⁵⁴⁷
- Image : ID⁵⁴⁸

⁵³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁵³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁵³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁵³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁵³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁵³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

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/>

⁵⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁵⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁵⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁵⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁵⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁵⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

⁵⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁵⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : InstrumentRef⁵⁴⁹
- Image : Name⁵⁵⁰
- Instrument : ID⁵⁵¹
- Objective : CalibratedMagnification⁵⁵²
- Objective : Correction⁵⁵³
- Objective : ID⁵⁵⁴
- Objective : Immersion⁵⁵⁵
- Objective : WorkingDistance⁵⁵⁶
- ObjectiveSettings : ID⁵⁵⁷
- Pixels : BigEndian⁵⁵⁸
- Pixels : DimensionOrder⁵⁵⁹
- Pixels : ID⁵⁶⁰
- Pixels : Interleaved⁵⁶¹
- Pixels : PhysicalSizeX⁵⁶²
- Pixels : PhysicalSizeY⁵⁶³
- Pixels : SignificantBits⁵⁶⁴
- Pixels : SizeC⁵⁶⁵
- Pixels : SizeT⁵⁶⁶
- Pixels : SizeX⁵⁶⁷
- Pixels : SizeY⁵⁶⁸
- Pixels : SizeZ⁵⁶⁹
- Pixels : Type⁵⁷⁰
- Plane : TheC⁵⁷¹
- Plane : TheT⁵⁷²
- Plane : TheZ⁵⁷³

⁵⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁵⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁵⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁵⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

⁵⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁵⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁵⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁵⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

⁵⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁵⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁵⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁵⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁵⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁵⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁵⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁵⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁵⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁵⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁵⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁵⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁵⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁵⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁵⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁵⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁵⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

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 version⁵⁷⁴ or the previous versions⁵⁷⁵ page to find documentation for the version you are using.

18.2.4 GelReader

This page lists supported metadata fields for the Bio-Formats Amersham Biosciences GEL format reader.

These fields are from the OME data model⁵⁷⁶. 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 Amersham Biosciences GEL format reader:

- Channel : ID⁵⁷⁷
- Channel : SamplesPerPixel⁵⁷⁸
- Image : AcquisitionDate⁵⁷⁹
- Image : ID⁵⁸⁰
- Image : Name⁵⁸¹
- Pixels : BigEndian⁵⁸²
- Pixels : DimensionOrder⁵⁸³
- Pixels : ID⁵⁸⁴
- Pixels : Interleaved⁵⁸⁵
- Pixels : PhysicalSizeX⁵⁸⁶
- Pixels : PhysicalSizeY⁵⁸⁷
- Pixels : SignificantBits⁵⁸⁸
- Pixels : SizeC⁵⁸⁹
- Pixels : SizeT⁵⁹⁰

⁵⁷⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁷⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁵⁷⁶<http://www.openmicroscopy.org/site/support/ome-model/>

⁵⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁵⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁵⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁵⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁵⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁵⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁵⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁵⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁵⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁵⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁵⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁵⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁵⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁵⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

- Pixels : SizeX⁵⁹¹
- Pixels : SizeY⁵⁹²
- Pixels : SizeZ⁵⁹³
- Pixels : Type⁵⁹⁴
- Plane : TheC⁵⁹⁵
- Plane : TheT⁵⁹⁶
- Plane : TheZ⁵⁹⁷

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 version⁵⁹⁸](#) or the [previous versions⁵⁹⁹](#) page to find documentation for the version you are using.

18.2.5 AmiraReader

This page lists supported metadata fields for the Bio-Formats Amira format reader.

These fields are from the [OME data model⁶⁰⁰](#). 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 : ID⁶⁰¹
- Channel : SamplesPerPixel⁶⁰²
- Image : AcquisitionDate⁶⁰³
- Image : ID⁶⁰⁴
- Image : Name⁶⁰⁵
- Pixels : BigEndian⁶⁰⁶
- Pixels : DimensionOrder⁶⁰⁷

⁵⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁵⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁵⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁵⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁵⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁵⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁵⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁵⁹⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁵⁹⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁰⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁶⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁶⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁶⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁶⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁶⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁶⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁶⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID⁶⁰⁸
- Pixels : Interleaved⁶⁰⁹
- Pixels : PhysicalSizeX⁶¹⁰
- Pixels : PhysicalSizeY⁶¹¹
- Pixels : PhysicalSizeZ⁶¹²
- Pixels : SignificantBits⁶¹³
- Pixels : SizeC⁶¹⁴
- Pixels : SizeT⁶¹⁵
- Pixels : SizeX⁶¹⁶
- Pixels : SizeY⁶¹⁷
- Pixels : SizeZ⁶¹⁸
- Pixels : Type⁶¹⁹
- Plane : TheC⁶²⁰
- Plane : TheT⁶²¹
- Plane : TheZ⁶²²

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 version⁶²³ or the previous versions⁶²⁴ page to find documentation for the version you are using.

18.2.6 FlowSightReader

This page lists supported metadata fields for the Bio-Formats FlowSight format reader.

These fields are from the OME data model⁶²⁵. 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%).

⁶⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁶⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁶¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁶¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁶¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁶¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁶¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁶¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁶¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁶¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁶¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁶¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁶²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁶²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁶²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁶²³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶²⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁶²⁵<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats FlowSight format reader:

- Channel : ID⁶²⁶
- Channel : Name⁶²⁷
- Channel : SamplesPerPixel⁶²⁸
- Image : AcquisitionDate⁶²⁹
- Image : ID⁶³⁰
- Image : Name⁶³¹
- Pixels : BigEndian⁶³²
- Pixels : DimensionOrder⁶³³
- Pixels : ID⁶³⁴
- Pixels : Interleaved⁶³⁵
- Pixels : SignificantBits⁶³⁶
- Pixels : SizeC⁶³⁷
- Pixels : SizeT⁶³⁸
- Pixels : SizeX⁶³⁹
- Pixels : SizeY⁶⁴⁰
- Pixels : SizeZ⁶⁴¹
- Pixels : Type⁶⁴²
- Plane : TheC⁶⁴³
- Plane : TheT⁶⁴⁴
- Plane : TheZ⁶⁴⁵

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 version⁶⁴⁶ or the previous versions⁶⁴⁷ page to find documentation for the version you are using.

⁶²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁶²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁶²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁶²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁶³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁶³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁶³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁶³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁶³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁶³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁶³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁶³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁶³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁶³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁶⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁶⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁶⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁶⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁶⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁶⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁶⁴⁶<http://www.openmicroscopy.org/site/support/bio-formats/5.0/>

⁶⁴⁷<http://www.openmicroscopy.org/site/support/legacy/>

18.2.7 AnalyzeReader

This page lists supported metadata fields for the Bio-Formats Analyze 7.5 format reader.

These fields are from the [OME data model](#)⁶⁴⁸. 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 : ID⁶⁴⁹
- Channel : SamplesPerPixel⁶⁵⁰
- Image : AcquisitionDate⁶⁵¹
- Image : Description⁶⁵²
- Image : ID⁶⁵³
- Image : Name⁶⁵⁴
- Pixels : BigEndian⁶⁵⁵
- Pixels : DimensionOrder⁶⁵⁶
- Pixels : ID⁶⁵⁷
- Pixels : Interleaved⁶⁵⁸
- Pixels : PhysicalSizeX⁶⁵⁹
- Pixels : PhysicalSizeY⁶⁶⁰
- Pixels : PhysicalSizeZ⁶⁶¹
- Pixels : SignificantBits⁶⁶²
- Pixels : SizeC⁶⁶³
- Pixels : SizeT⁶⁶⁴
- Pixels : SizeX⁶⁶⁵
- Pixels : SizeY⁶⁶⁶

⁶⁴⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁶⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁶⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁶⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁶⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁶⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁶⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁶⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁶⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁶⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁶⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁶⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁶⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁶⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁶⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁶⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁶⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁶⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁶⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ⁶⁶⁷
- Pixels : TimeIncrement⁶⁶⁸
- Pixels : Type⁶⁶⁹
- Plane : TheC⁶⁷⁰
- Plane : TheT⁶⁷¹
- Plane : TheZ⁶⁷²

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 version⁶⁷³ or the previous versions⁶⁷⁴ page to find documentation for the version you are using.

18.2.8 AFIREader

This page lists supported metadata fields for the Bio-Formats Aperio AFI format reader.

These fields are from the OME data model⁶⁷⁵. 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 : EmissionWavelength⁶⁷⁶
- Channel : ExcitationWavelength⁶⁷⁷
- Channel : ID⁶⁷⁸
- Channel : Name⁶⁷⁹
- Channel : SamplesPerPixel⁶⁸⁰
- Image : AcquisitionDate⁶⁸¹
- Image : ID⁶⁸²
- Image : InstrumentRef⁶⁸³

⁶⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁶⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

⁶⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁶⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁶⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁶⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁶⁷³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁶⁷⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁶⁷⁵<http://www.openmicroscopy.org/site/support/ome-model/>

⁶⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁶⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

⁶⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁶⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁶⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁶⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁶⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁶⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

- Image : Name⁶⁸⁴
- Instrument : ID⁶⁸⁵
- Objective : ID⁶⁸⁶
- Objective : NominalMagnification⁶⁸⁷
- ObjectiveSettings : ID⁶⁸⁸
- Pixels : BigEndian⁶⁸⁹
- Pixels : DimensionOrder⁶⁹⁰
- Pixels : ID⁶⁹¹
- Pixels : Interleaved⁶⁹²
- Pixels : PhysicalSizeX⁶⁹³
- Pixels : PhysicalSizeY⁶⁹⁴
- Pixels : SignificantBits⁶⁹⁵
- Pixels : SizeC⁶⁹⁶
- Pixels : SizeT⁶⁹⁷
- Pixels : SizeX⁶⁹⁸
- Pixels : SizeY⁶⁹⁹
- Pixels : SizeZ⁷⁰⁰
- Pixels : Type⁷⁰¹
- Plane : ExposureTime⁷⁰²
- Plane : TheC⁷⁰³
- Plane : TheT⁷⁰⁴
- Plane : TheZ⁷⁰⁵

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 version⁷⁰⁶ or the previous versions⁷⁰⁷ page to find documentation for the version you are using.

⁶⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁶⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁶⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁶⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁶⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁶⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁶⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁶⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁶⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁶⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁶⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁶⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁶⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁶⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁶⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁶⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁷⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁷⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁷⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

⁷⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁷⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁷⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁷⁰⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁰⁷<http://www.openmicroscopy.org/site/support/legacy/>

18.2.9 SVSReader

This page lists supported metadata fields for the Bio-Formats Aperio SVS format reader.

These fields are from the [OME data model](#)⁷⁰⁸. 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 : EmissionWavelength⁷⁰⁹
- Channel : ExcitationWavelength⁷¹⁰
- Channel : ID⁷¹¹
- Channel : SamplesPerPixel⁷¹²
- Image : AcquisitionDate⁷¹³
- Image : Description⁷¹⁴
- Image : ID⁷¹⁵
- Image : InstrumentRef⁷¹⁶
- Image : Name⁷¹⁷
- Instrument : ID⁷¹⁸
- Objective : ID⁷¹⁹
- Objective : NominalMagnification⁷²⁰
- ObjectiveSettings : ID⁷²¹
- Pixels : BigEndian⁷²²
- Pixels : DimensionOrder⁷²³
- Pixels : ID⁷²⁴
- Pixels : Interleaved⁷²⁵
- Pixels : PhysicalSizeX⁷²⁶
- Pixels : PhysicalSizeY⁷²⁷

⁷⁰⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁷⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁷¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

⁷¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁷¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁷¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁷¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁷¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁷¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁷¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁷¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁷¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁷²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁷²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁷²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁷²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁷²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁷²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁷²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁷²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

- Pixels : SignificantBits⁷²⁸
- Pixels : SizeC⁷²⁹
- Pixels : SizeT⁷³⁰
- Pixels : SizeX⁷³¹
- Pixels : SizeY⁷³²
- Pixels : SizeZ⁷³³
- Pixels : Type⁷³⁴
- Plane : TheC⁷³⁵
- Plane : TheT⁷³⁶
- Plane : TheZ⁷³⁷

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 version⁷³⁸ or the previous versions⁷³⁹ page to find documentation for the version you are using.

18.2.10 CellWorxReader

This page lists supported metadata fields for the Bio-Formats CellWorx format reader.

These fields are from the OME data model⁷⁴⁰. 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 : EmissionWavelength⁷⁴¹
- Channel : ExcitationWavelength⁷⁴²
- Channel : ID⁷⁴³
- Channel : Name⁷⁴⁴

⁷²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁷²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁷³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁷³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁷³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁷³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁷³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁷³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁷³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁷³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁷³⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷³⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁴⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁷⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁷⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

⁷⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁷⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

- Channel : SamplesPerPixel⁷⁴⁵
- Detector : ID⁷⁴⁶
- DetectorSettings : Gain⁷⁴⁷
- DetectorSettings : ID⁷⁴⁸
- Image : AcquisitionDate⁷⁴⁹
- Image : ID⁷⁵⁰
- Image : InstrumentRef⁷⁵¹
- Image : Name⁷⁵²
- Instrument : ID⁷⁵³
- Microscope : SerialNumber⁷⁵⁴
- Pixels : BigEndian⁷⁵⁵
- Pixels : DimensionOrder⁷⁵⁶
- Pixels : ID⁷⁵⁷
- Pixels : Interleaved⁷⁵⁸
- Pixels : PhysicalSizeX⁷⁵⁹
- Pixels : PhysicalSizeY⁷⁶⁰
- Pixels : SignificantBits⁷⁶¹
- Pixels : SizeC⁷⁶²
- Pixels : SizeT⁷⁶³
- Pixels : SizeX⁷⁶⁴
- Pixels : SizeY⁷⁶⁵
- Pixels : SizeZ⁷⁶⁶
- Pixels : Type⁷⁶⁷
- Plane : TheC⁷⁶⁸
- Plane : TheT⁷⁶⁹
- Plane : TheZ⁷⁷⁰

⁷⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁷⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁷⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁷⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁷⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁷⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁷⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁷⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁷⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁷⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁷⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁷⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁷⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁷⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁷⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁷⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁷⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁷⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁷⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁷⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁷⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁷⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁷⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁷⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁷⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁷⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

- Plate : ID⁷⁷¹
- Plate : Name⁷⁷²
- PlateAcquisition : EndTime⁷⁷³
- PlateAcquisition : ID⁷⁷⁴
- PlateAcquisition : MaximumFieldCount⁷⁷⁵
- PlateAcquisition : StartTime⁷⁷⁶
- PlateAcquisition : WellSampleRef⁷⁷⁷
- Well : Column⁷⁷⁸
- Well : ID⁷⁷⁹
- Well : Row⁷⁸⁰
- WellSample : ID⁷⁸¹
- WellSample : ImageRef⁷⁸²
- WellSample : Index⁷⁸³
- WellSample : PositionX⁷⁸⁴
- WellSample : PositionY⁷⁸⁵

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 version⁷⁸⁶ or the previous versions⁷⁸⁷ page to find documentation for the version you are using.

18.2.11 AVIReader

This page lists supported metadata fields for the Bio-Formats Audio Video Interleave format reader.

These fields are from the [OME data model](#)⁷⁸⁸. 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%).

⁷⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

⁷⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

⁷⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_EndTime

⁷⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

⁷⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

⁷⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_StartTime

⁷⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

⁷⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

⁷⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

⁷⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

⁷⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

⁷⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

⁷⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

⁷⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

⁷⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

⁷⁸⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁷⁸⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁷⁸⁸<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Audio Video Interleave format reader:

- Channel : ID⁷⁸⁹
- Channel : SamplesPerPixel⁷⁹⁰
- Image : AcquisitionDate⁷⁹¹
- Image : ID⁷⁹²
- Image : Name⁷⁹³
- Pixels : BigEndian⁷⁹⁴
- Pixels : DimensionOrder⁷⁹⁵
- Pixels : ID⁷⁹⁶
- Pixels : Interleaved⁷⁹⁷
- Pixels : SignificantBits⁷⁹⁸
- Pixels : SizeC⁷⁹⁹
- Pixels : SizeT⁸⁰⁰
- Pixels : SizeX⁸⁰¹
- Pixels : SizeY⁸⁰²
- Pixels : SizeZ⁸⁰³
- Pixels : Type⁸⁰⁴
- Plane : TheC⁸⁰⁵
- Plane : TheT⁸⁰⁶
- Plane : TheZ⁸⁰⁷

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 version⁸⁰⁸ or the previous versions⁸⁰⁹ page to find documentation for the version you are using.

⁷⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁷⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁷⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁷⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁷⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁷⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁷⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁷⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁷⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁷⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁷⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁸⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁸⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁸⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁸⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁸⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁸⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁸⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁸⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁸⁰⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸⁰⁹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.12 ARFReader

This page lists supported metadata fields for the Bio-Formats ARF format reader.

These fields are from the [OME data model](#)⁸¹⁰. 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 : ID⁸¹¹
- Channel : SamplesPerPixel⁸¹²
- Image : AcquisitionDate⁸¹³
- Image : ID⁸¹⁴
- Image : Name⁸¹⁵
- Pixels : BigEndian⁸¹⁶
- Pixels : DimensionOrder⁸¹⁷
- Pixels : ID⁸¹⁸
- Pixels : Interleaved⁸¹⁹
- Pixels : SignificantBits⁸²⁰
- Pixels : SizeC⁸²¹
- Pixels : SizeT⁸²²
- Pixels : SizeX⁸²³
- Pixels : SizeY⁸²⁴
- Pixels : SizeZ⁸²⁵
- Pixels : Type⁸²⁶
- Plane : TheC⁸²⁷
- Plane : TheT⁸²⁸

⁸¹⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁸¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁸¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁸¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁸¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁸¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁸¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁸¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁸¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁸¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁸²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁸²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁸²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁸²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁸²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁸²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁸²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁸²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁸²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ⁸²⁹

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 version⁸³⁰ or the previous versions⁸³¹ page to find documentation for the version you are using.

18.2.13 BDReader

This page lists supported metadata fields for the Bio-Formats BD Pathway format reader.

These fields are from the OME data model⁸³². 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%).

Supported fields

These fields are fully supported by the Bio-Formats BD Pathway format reader:

- Channel : EmissionWavelength⁸³³
- Channel : ExcitationWavelength⁸³⁴
- Channel : ID⁸³⁵
- Channel : Name⁸³⁶
- Channel : SamplesPerPixel⁸³⁷
- Detector : ID⁸³⁸
- DetectorSettings : Binning⁸³⁹
- DetectorSettings : Gain⁸⁴⁰
- DetectorSettings : ID⁸⁴¹
- DetectorSettings : Offset⁸⁴²
- Image : AcquisitionDate⁸⁴³
- Image : ID⁸⁴⁴
- Image : InstrumentRef⁸⁴⁵

⁸²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁸³⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸³¹<http://www.openmicroscopy.org/site/support/legacy/>

⁸³²<http://www.openmicroscopy.org/site/support/ome-model/>

⁸³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁸³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

⁸³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁸³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁸³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁸³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁸³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁸⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁸⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁸⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

⁸⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁸⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁸⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

- Image : Name⁸⁴⁶
- Image : ROIRef⁸⁴⁷
- Instrument : ID⁸⁴⁸
- Objective : ID⁸⁴⁹
- Objective : LensNA⁸⁵⁰
- Objective : Manufacturer⁸⁵¹
- Objective : NominalMagnification⁸⁵²
- ObjectiveSettings : ID⁸⁵³
- Pixels : BigEndian⁸⁵⁴
- Pixels : DimensionOrder⁸⁵⁵
- Pixels : ID⁸⁵⁶
- Pixels : Interleaved⁸⁵⁷
- Pixels : SignificantBits⁸⁵⁸
- Pixels : SizeC⁸⁵⁹
- Pixels : SizeT⁸⁶⁰
- Pixels : SizeX⁸⁶¹
- Pixels : SizeY⁸⁶²
- Pixels : SizeZ⁸⁶³
- Pixels : Type⁸⁶⁴
- Plane : DeltaT⁸⁶⁵
- Plane : ExposureTime⁸⁶⁶
- Plane : TheC⁸⁶⁷
- Plane : TheT⁸⁶⁸
- Plane : TheZ⁸⁶⁹
- Plate : ColumnNamingConvention⁸⁷⁰
- Plate : Description⁸⁷¹

⁸⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁸⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

⁸⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁸⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁸⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

⁸⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁸⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁸⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁸⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁸⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁸⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁸⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁸⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁸⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁸⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁸⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁸⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁸⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁸⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁸⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁸⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

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

⁸⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

⁸⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Description

- Plate : ID⁸⁷²
- Plate : Name⁸⁷³
- Plate : RowNamingConvention⁸⁷⁴
- PlateAcquisition : ID⁸⁷⁵
- PlateAcquisition : MaximumFieldCount⁸⁷⁶
- PlateAcquisition : WellSampleRef⁸⁷⁷
- ROI : ID⁸⁷⁸
- Rectangle : Height⁸⁷⁹
- Rectangle : ID⁸⁸⁰
- Rectangle : Width⁸⁸¹
- Rectangle : X⁸⁸²
- Rectangle : Y⁸⁸³
- Well : Column⁸⁸⁴
- Well : ID⁸⁸⁵
- Well : Row⁸⁸⁶
- WellSample : ID⁸⁸⁷
- WellSample : ImageRef⁸⁸⁸
- WellSample : Index⁸⁸⁹

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 version⁸⁹⁰ or the previous versions⁸⁹¹ page to find documentation for the version you are using.

18.2.14 SDTReader

This page lists supported metadata fields for the Bio-Formats SPCImage Data format reader.

These fields are from the OME data model⁸⁹². 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*:

⁸⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

⁸⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

⁸⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

⁸⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

⁸⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

⁸⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

⁸⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

⁸⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

⁸⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁸⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

⁸⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

⁸⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

⁸⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

⁸⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

⁸⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

⁸⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

⁸⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

⁸⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

⁸⁹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁸⁹¹<http://www.openmicroscopy.org/site/support/legacy/>

⁸⁹²<http://www.openmicroscopy.org/site/support/ome-model/>

- 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 : ID⁸⁹³
- Channel : SamplesPerPixel⁸⁹⁴
- Image : AcquisitionDate⁸⁹⁵
- Image : ID⁸⁹⁶
- Image : Name⁸⁹⁷
- Pixels : BigEndian⁸⁹⁸
- Pixels : DimensionOrder⁸⁹⁹
- Pixels : ID⁹⁰⁰
- Pixels : Interleaved⁹⁰¹
- Pixels : SignificantBits⁹⁰²
- Pixels : SizeC⁹⁰³
- Pixels : SizeT⁹⁰⁴
- Pixels : SizeX⁹⁰⁵
- Pixels : SizeY⁹⁰⁶
- Pixels : SizeZ⁹⁰⁷
- Pixels : Type⁹⁰⁸
- Plane : TheC⁹⁰⁹
- Plane : TheT⁹¹⁰
- Plane : TheZ⁹¹¹

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 version⁹¹² or the previous versions⁹¹³ page to find documentation for the version you are using.

⁸⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁸⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁸⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁸⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁸⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁸⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁸⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁹¹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹¹³<http://www.openmicroscopy.org/site/support/legacy/>

18.2.15 BioRadGelReader

This page lists supported metadata fields for the Bio-Formats Bio-Rad GEL format reader.

These fields are from the [OME data model](#)⁹¹⁴. 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 : ID⁹¹⁵
- Channel : SamplesPerPixel⁹¹⁶
- Image : AcquisitionDate⁹¹⁷
- Image : ID⁹¹⁸
- Image : Name⁹¹⁹
- Pixels : BigEndian⁹²⁰
- Pixels : DimensionOrder⁹²¹
- Pixels : ID⁹²²
- Pixels : Interleaved⁹²³
- Pixels : PhysicalSizeX⁹²⁴
- Pixels : PhysicalSizeY⁹²⁵
- Pixels : SignificantBits⁹²⁶
- Pixels : SizeC⁹²⁷
- Pixels : SizeT⁹²⁸
- Pixels : SizeX⁹²⁹
- Pixels : SizeY⁹³⁰
- Pixels : SizeZ⁹³¹
- Pixels : Type⁹³²

⁹¹⁴<http://www.openmicroscopy.org/site/support/ome-model/>

⁹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC⁹³³
- Plane : TheT⁹³⁴
- Plane : TheZ⁹³⁵

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 version⁹³⁶](#) or the [previous versions⁹³⁷](#) page to find documentation for the version you are using.

18.2.16 BioRadReader

This page lists supported metadata fields for the Bio-Formats Bio-Rad PIC format reader.

These fields are from the [OME data model⁹³⁸](#). 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 : ID⁹³⁹
- Channel : SamplesPerPixel⁹⁴⁰
- Detector : Gain⁹⁴¹
- Detector : ID⁹⁴²
- Detector : Offset⁹⁴³
- Detector : Type⁹⁴⁴
- DetectorSettings : Gain⁹⁴⁵
- DetectorSettings : ID⁹⁴⁶
- DetectorSettings : Offset⁹⁴⁷
- Experiment : ID⁹⁴⁸
- Experiment : Type⁹⁴⁹

⁹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁹³⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹³⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁹³⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

⁹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

⁹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

⁹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID

⁹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type

- Image : AcquisitionDate⁹⁵⁰
- Image : ID⁹⁵¹
- Image : InstrumentRef⁹⁵²
- Image : Name⁹⁵³
- Instrument : ID⁹⁵⁴
- Objective : Correction⁹⁵⁵
- Objective : ID⁹⁵⁶
- Objective : Immersion⁹⁵⁷
- Objective : LensNA⁹⁵⁸
- Objective : Model⁹⁵⁹
- Objective : NominalMagnification⁹⁶⁰
- ObjectiveSettings : ID⁹⁶¹
- Pixels : BigEndian⁹⁶²
- Pixels : DimensionOrder⁹⁶³
- Pixels : ID⁹⁶⁴
- Pixels : Interleaved⁹⁶⁵
- Pixels : PhysicalSizeX⁹⁶⁶
- Pixels : PhysicalSizeY⁹⁶⁷
- Pixels : PhysicalSizeZ⁹⁶⁸
- Pixels : SignificantBits⁹⁶⁹
- Pixels : SizeC⁹⁷⁰
- Pixels : SizeT⁹⁷¹
- Pixels : SizeX⁹⁷²
- Pixels : SizeY⁹⁷³
- Pixels : SizeZ⁹⁷⁴
- Pixels : Type⁹⁷⁵

⁹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

⁹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC⁹⁷⁶
- Plane : TheT⁹⁷⁷
- Plane : TheZ⁹⁷⁸

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 version⁹⁷⁹](#) or the [previous versions⁹⁸⁰](#) page to find documentation for the version you are using.

18.2.17 BioRadSCNReader

This page lists supported metadata fields for the Bio-Formats Bio-Rad SCN format reader.

These fields are from the [OME data model⁹⁸¹](#). 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 : ID⁹⁸²
- Channel : SamplesPerPixel⁹⁸³
- Detector : ID⁹⁸⁴
- DetectorSettings : Binning⁹⁸⁵
- DetectorSettings : Gain⁹⁸⁶
- DetectorSettings : ID⁹⁸⁷
- Image : AcquisitionDate⁹⁸⁸
- Image : ID⁹⁸⁹
- Image : Name⁹⁹⁰
- Instrument : ID⁹⁹¹
- Microscope : Model⁹⁹²

⁹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁹⁷⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁹⁸⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁹⁸¹<http://www.openmicroscopy.org/site/support/ome-model/>

⁹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

- Microscope : SerialNumber⁹⁹³
- Pixels : BigEndian⁹⁹⁴
- Pixels : DimensionOrder⁹⁹⁵
- Pixels : ID⁹⁹⁶
- Pixels : Interleaved⁹⁹⁷
- Pixels : PhysicalSizeX⁹⁹⁸
- Pixels : PhysicalSizeY⁹⁹⁹
- Pixels : SignificantBits¹⁰⁰⁰
- Pixels : SizeC¹⁰⁰¹
- Pixels : SizeT¹⁰⁰²
- Pixels : SizeX¹⁰⁰³
- Pixels : SizeY¹⁰⁰⁴
- Pixels : SizeZ¹⁰⁰⁵
- Pixels : Type¹⁰⁰⁶
- Plane : ExposureTime¹⁰⁰⁷
- Plane : TheC¹⁰⁰⁸
- Plane : TheT¹⁰⁰⁹
- Plane : TheZ¹⁰¹⁰

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 version¹⁰¹¹](#) or the [previous versions¹⁰¹²](#) page to find documentation for the version you are using.

18.2.18 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 model¹⁰¹³](#). 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](#):

⁹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁰⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁰⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁰⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁰⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁰⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁰⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁰⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁰⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹⁰⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁰⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁰¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁰¹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰¹²<http://www.openmicroscopy.org/site/support/legacy/>

¹⁰¹³<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 Bitplane Imaris 5.5 (HDF) format reader:

- Channel : Color¹⁰¹⁴
- Channel : ID¹⁰¹⁵
- Channel : SamplesPerPixel¹⁰¹⁶
- Image : AcquisitionDate¹⁰¹⁷
- Image : ID¹⁰¹⁸
- Image : Name¹⁰¹⁹
- Pixels : BigEndian¹⁰²⁰
- Pixels : DimensionOrder¹⁰²¹
- Pixels : ID¹⁰²²
- Pixels : Interleaved¹⁰²³
- Pixels : PhysicalSizeX¹⁰²⁴
- Pixels : PhysicalSizeY¹⁰²⁵
- Pixels : PhysicalSizeZ¹⁰²⁶
- Pixels : SignificantBits¹⁰²⁷
- Pixels : SizeC¹⁰²⁸
- Pixels : SizeT¹⁰²⁹
- Pixels : SizeX¹⁰³⁰
- Pixels : SizeY¹⁰³¹
- Pixels : SizeZ¹⁰³²
- Pixels : Type¹⁰³³
- Plane : TheC¹⁰³⁴
- Plane : TheT¹⁰³⁵
- Plane : TheZ¹⁰³⁶

¹⁰¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

¹⁰¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁰¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁰¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁰¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁰¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁰²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁰²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁰²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁰²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁰²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁰²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁰²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹⁰²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁰²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁰²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁰³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁰³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁰³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁰³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁰³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁰³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁰³⁶http://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 version¹⁰³⁷](#) or the [previous versions¹⁰³⁸](#) page to find documentation for the version you are using.

18.2.19 BrukerReader

This page lists supported metadata fields for the Bio-Formats Bruker format reader.

These fields are from the [OME data model¹⁰³⁹](#). 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 Bruker format reader:

- Channel : ID¹⁰⁴⁰
- Channel : SamplesPerPixel¹⁰⁴¹
- Experimenter : ID¹⁰⁴²
- Experimenter : Institution¹⁰⁴³
- Experimenter : LastName¹⁰⁴⁴
- Image : AcquisitionDate¹⁰⁴⁵
- Image : ExperimenterRef¹⁰⁴⁶
- Image : ID¹⁰⁴⁷
- Image : Name¹⁰⁴⁸
- Pixels : BigEndian¹⁰⁴⁹
- Pixels : DimensionOrder¹⁰⁵⁰
- Pixels : ID¹⁰⁵¹
- Pixels : Interleaved¹⁰⁵²
- Pixels : SignificantBits¹⁰⁵³

¹⁰³⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰³⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁰³⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁰⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁰⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁰⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

¹⁰⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_Institution

¹⁰⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

¹⁰⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁰⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID

¹⁰⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁰⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁰⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁰⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁰⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁰⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁰⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

- Pixels : SizeC¹⁰⁵⁴
- Pixels : SizeT¹⁰⁵⁵
- Pixels : SizeX¹⁰⁵⁶
- Pixels : SizeY¹⁰⁵⁷
- Pixels : SizeZ¹⁰⁵⁸
- Pixels : Type¹⁰⁵⁹
- Plane : TheC¹⁰⁶⁰
- Plane : TheT¹⁰⁶¹
- Plane : TheZ¹⁰⁶²

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 version¹⁰⁶³](#) or the [previous versions¹⁰⁶⁴](#) page to find documentation for the version you are using.

18.2.20 BurleighReader

This page lists supported metadata fields for the Bio-Formats Burleigh format reader.

These fields are from the [OME data model¹⁰⁶⁵](#). 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 : ID¹⁰⁶⁶
- Channel : SamplesPerPixel¹⁰⁶⁷
- Image : AcquisitionDate¹⁰⁶⁸
- Image : ID¹⁰⁶⁹
- Image : Name¹⁰⁷⁰

¹⁰⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁰⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁰⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁰⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁰⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁰⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁰⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁰⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁰⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁰⁶³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰⁶⁴<http://www.openmicroscopy.org/site/support/legacy/>

¹⁰⁶⁵<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁰⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁰⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁰⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁰⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁰⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

- Pixels : BigEndian¹⁰⁷¹
- Pixels : DimensionOrder¹⁰⁷²
- Pixels : ID¹⁰⁷³
- Pixels : Interleaved¹⁰⁷⁴
- Pixels : PhysicalSizeX¹⁰⁷⁵
- Pixels : PhysicalSizeY¹⁰⁷⁶
- Pixels : PhysicalSizeZ¹⁰⁷⁷
- Pixels : SignificantBits¹⁰⁷⁸
- Pixels : SizeC¹⁰⁷⁹
- Pixels : SizeT¹⁰⁸⁰
- Pixels : SizeX¹⁰⁸¹
- Pixels : SizeY¹⁰⁸²
- Pixels : SizeZ¹⁰⁸³
- Pixels : Type¹⁰⁸⁴
- Plane : TheC¹⁰⁸⁵
- Plane : TheT¹⁰⁸⁶
- Plane : TheZ¹⁰⁸⁷

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 version¹⁰⁸⁸ or the previous versions¹⁰⁸⁹ page to find documentation for the version you are using.

18.2.21 DNGReader

This page lists supported metadata fields for the Bio-Formats DNG format reader.

These fields are from the OME data model¹⁰⁹⁰. 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%).

¹⁰⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁰⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁰⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁰⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁰⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁰⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁰⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹⁰⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁰⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁰⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁰⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁰⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁰⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁰⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁰⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁰⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁰⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁰⁸⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁰⁸⁹<http://www.openmicroscopy.org/site/support/legacy/>

¹⁰⁹⁰<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 DNG format reader:

- Channel : ID¹⁰⁹¹
- Channel : SamplesPerPixel¹⁰⁹²
- Image : AcquisitionDate¹⁰⁹³
- Image : ID¹⁰⁹⁴
- Image : Name¹⁰⁹⁵
- Pixels : BigEndian¹⁰⁹⁶
- Pixels : DimensionOrder¹⁰⁹⁷
- Pixels : ID¹⁰⁹⁸
- Pixels : Interleaved¹⁰⁹⁹
- Pixels : SignificantBits¹¹⁰⁰
- Pixels : SizeC¹¹⁰¹
- Pixels : SizeT¹¹⁰²
- Pixels : SizeX¹¹⁰³
- Pixels : SizeY¹¹⁰⁴
- Pixels : SizeZ¹¹⁰⁵
- Pixels : Type¹¹⁰⁶
- Plane : TheC¹¹⁰⁷
- Plane : TheT¹¹⁰⁸
- Plane : TheZ¹¹⁰⁹

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 version¹¹¹⁰ or the previous versions¹¹¹¹ page to find documentation for the version you are using.

¹⁰⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁰⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁰⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁰⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁰⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁰⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁰⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁰⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁰⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹¹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹¹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹¹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹¹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹¹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹¹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹¹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹¹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹¹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹¹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹¹¹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹¹¹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.22 CellH5Reader

This page lists supported metadata fields for the Bio-Formats CellH5 (HDF) format reader.

These fields are from the [OME data model](#)¹¹¹². 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 : ID¹¹¹³
- Channel : SamplesPerPixel¹¹¹⁴
- Image : AcquisitionDate¹¹¹⁵
- Image : ID¹¹¹⁶
- Image : Name¹¹¹⁷
- Image : ROIRef¹¹¹⁸
- Pixels : BigEndian¹¹¹⁹
- Pixels : DimensionOrder¹¹²⁰
- Pixels : ID¹¹²¹
- Pixels : Interleaved¹¹²²
- Pixels : SignificantBits¹¹²³
- Pixels : SizeC¹¹²⁴
- Pixels : SizeT¹¹²⁵
- Pixels : SizeX¹¹²⁶
- Pixels : SizeY¹¹²⁷
- Pixels : SizeZ¹¹²⁸
- Pixels : Type¹¹²⁹
- Plane : TheC¹¹³⁰

¹¹¹²<http://www.openmicroscopy.org/site/support/ome-model/>

¹¹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹¹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹¹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹¹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹¹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹¹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

¹¹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹¹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹¹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹¹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹¹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹¹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹¹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹¹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹¹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹¹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹¹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹¹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

- Plane : TheT¹¹³¹
- Plane : TheZ¹¹³²
- ROI : ID¹¹³³
- ROI : Name¹¹³⁴
- Rectangle : Height¹¹³⁵
- Rectangle : ID¹¹³⁶
- Rectangle : StrokeColor¹¹³⁷
- Rectangle : TheC¹¹³⁸
- Rectangle : TheT¹¹³⁹
- Rectangle : TheZ¹¹⁴⁰
- Rectangle : Width¹¹⁴¹
- Rectangle : X¹¹⁴²
- Rectangle : Y¹¹⁴³

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 version¹¹⁴⁴](#) or the [previous versions¹¹⁴⁵](#) page to find documentation for the version you are using.

18.2.23 CellomicsReader

This page lists supported metadata fields for the Bio-Formats Cellomics C01 format reader.

These fields are from the [OME data model¹¹⁴⁶](#). 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 : ID¹¹⁴⁷

¹¹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹¹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹¹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

¹¹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Name

¹¹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

¹¹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

¹¹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

¹¹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheC

¹¹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

¹¹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

¹¹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

¹¹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

¹¹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

¹¹⁴⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹⁴⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹¹⁴⁶<http://www.openmicroscopy.org/site/support/ome-model/>

¹¹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

- Channel : SamplesPerPixel¹¹⁴⁸
- Image : AcquisitionDate¹¹⁴⁹
- Image : ID¹¹⁵⁰
- Image : Name¹¹⁵¹
- Pixels : BigEndian¹¹⁵²
- Pixels : DimensionOrder¹¹⁵³
- Pixels : ID¹¹⁵⁴
- Pixels : Interleaved¹¹⁵⁵
- Pixels : PhysicalSizeX¹¹⁵⁶
- Pixels : PhysicalSizeY¹¹⁵⁷
- Pixels : SignificantBits¹¹⁵⁸
- Pixels : SizeC¹¹⁵⁹
- Pixels : SizeT¹¹⁶⁰
- Pixels : SizeX¹¹⁶¹
- Pixels : SizeY¹¹⁶²
- Pixels : SizeZ¹¹⁶³
- Pixels : Type¹¹⁶⁴
- Plane : TheC¹¹⁶⁵
- Plane : TheT¹¹⁶⁶
- Plane : TheZ¹¹⁶⁷
- Plate : ColumnNamingConvention¹¹⁶⁸
- Plate : ID¹¹⁶⁹
- Plate : Name¹¹⁷⁰
- Plate : RowNamingConvention¹¹⁷¹
- Well : Column¹¹⁷²
- Well : ID¹¹⁷³

¹¹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹¹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹¹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹¹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹¹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹¹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹¹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹¹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹¹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹¹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹¹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹¹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹¹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹¹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹¹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹¹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹¹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹¹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹¹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹¹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹¹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

¹¹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

¹¹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

¹¹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

¹¹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

¹¹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

- Well : Row¹¹⁷⁴
- WellSample : ID¹¹⁷⁵
- WellSample : ImageRef¹¹⁷⁶
- WellSample : Index¹¹⁷⁷

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 version¹¹⁷⁸ or the previous versions¹¹⁷⁹ page to find documentation for the version you are using.

18.2.24 CellSensReader

This page lists supported metadata fields for the Bio-Formats CellSens VSI format reader.

These fields are from the OME data model¹¹⁸⁰. 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 : EmissionWavelength¹¹⁸¹
- Channel : ID¹¹⁸²
- Channel : Name¹¹⁸³
- Channel : SamplesPerPixel¹¹⁸⁴
- Detector : Gain¹¹⁸⁵
- Detector : ID¹¹⁸⁶
- Detector : Manufacturer¹¹⁸⁷
- Detector : Model¹¹⁸⁸
- Detector : Offset¹¹⁸⁹
- Detector : SerialNumber¹¹⁹⁰

¹¹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

¹¹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

¹¹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

¹¹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

¹¹⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹¹⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

¹¹⁸⁰<http://www.openmicroscopy.org/site/support/ome-model/>

¹¹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

¹¹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹¹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

¹¹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹¹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

¹¹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹¹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

¹¹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹¹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

¹¹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

- Detector : Type¹¹⁹¹
- DetectorSettings : Binning¹¹⁹²
- DetectorSettings : Gain¹¹⁹³
- DetectorSettings : ID¹¹⁹⁴
- DetectorSettings : Offset¹¹⁹⁵
- Image : AcquisitionDate¹¹⁹⁶
- Image : ID¹¹⁹⁷
- Image : InstrumentRef¹¹⁹⁸
- Image : Name¹¹⁹⁹
- Instrument : ID¹²⁰⁰
- Objective : ID¹²⁰¹
- Objective : LensNA¹²⁰²
- Objective : Model¹²⁰³
- Objective : NominalMagnification¹²⁰⁴
- Objective : WorkingDistance¹²⁰⁵
- ObjectiveSettings : ID¹²⁰⁶
- ObjectiveSettings : RefractiveIndex¹²⁰⁷
- Pixels : BigEndian¹²⁰⁸
- Pixels : DimensionOrder¹²⁰⁹
- Pixels : ID¹²¹⁰
- Pixels : Interleaved¹²¹¹
- Pixels : PhysicalSizeX¹²¹²
- Pixels : PhysicalSizeY¹²¹³
- Pixels : SignificantBits¹²¹⁴
- Pixels : SizeC¹²¹⁵
- Pixels : SizeT¹²¹⁶

¹¹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹¹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

¹¹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

¹¹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹¹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

¹¹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹¹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹¹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹¹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹²⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹²⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹²⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

¹²⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹²⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹²⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

¹²⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹²⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

¹²⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹²⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹²¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹²¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹²¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹²¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹²¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹²¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹²¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

- Pixels : SizeX¹²¹⁷
- Pixels : SizeY¹²¹⁸
- Pixels : SizeZ¹²¹⁹
- Pixels : Type¹²²⁰
- Plane : ExposureTime¹²²¹
- Plane : PositionX¹²²²
- Plane : PositionY¹²²³
- Plane : TheC¹²²⁴
- Plane : TheT¹²²⁵
- Plane : TheZ¹²²⁶

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 version¹²²⁷](#) or the [previous versions¹²²⁸](#) page to find documentation for the version you are using.

18.2.25 CellVoyagerReader

This page lists supported metadata fields for the Bio-Formats CellVoyager format reader.

These fields are from the [OME data model¹²²⁹](#). 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 : ID¹²³⁰
- Channel : Name¹²³¹
- Channel : PinholeSize¹²³²
- Channel : SamplesPerPixel¹²³³

¹²¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹²¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹²¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹²²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹²²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹²²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹²²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹²²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹²²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹²²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹²²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹²²⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹²²⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹²³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹²³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

¹²³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

¹²³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

- Image : AcquisitionDate¹²³⁴
- Image : ID¹²³⁵
- Image : Name¹²³⁶
- Pixels : BigEndian¹²³⁷
- Pixels : DimensionOrder¹²³⁸
- Pixels : ID¹²³⁹
- Pixels : Interleaved¹²⁴⁰
- Pixels : SignificantBits¹²⁴¹
- Pixels : SizeC¹²⁴²
- Pixels : SizeT¹²⁴³
- Pixels : SizeX¹²⁴⁴
- Pixels : SizeY¹²⁴⁵
- Pixels : SizeZ¹²⁴⁶
- Pixels : Type¹²⁴⁷
- Plane : TheC¹²⁴⁸
- Plane : TheT¹²⁴⁹
- Plane : TheZ¹²⁵⁰
- Plate : Columns¹²⁵¹
- Plate : Rows¹²⁵²
- PlateAcquisition : EndTime¹²⁵³
- PlateAcquisition : ID¹²⁵⁴
- PlateAcquisition : MaximumFieldCount¹²⁵⁵
- PlateAcquisition : StartTime¹²⁵⁶
- Well : Column¹²⁵⁷
- Well : ID¹²⁵⁸
- Well : Row¹²⁵⁹

¹²³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹²³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹²³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹²³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹²³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹²³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹²⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹²⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹²⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹²⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹²⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹²⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹²⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹²⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹²⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹²⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹²⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹²⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Columns

¹²⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Rows

¹²⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_EndTime

¹²⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

¹²⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

¹²⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_StartTime

¹²⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

¹²⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

¹²⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

- WellSample : ID¹²⁶⁰
- WellSample : Index¹²⁶¹
- WellSample : PositionX¹²⁶²
- WellSample : PositionY¹²⁶³

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 version¹²⁶⁴ or the previous versions¹²⁶⁵ page to find documentation for the version you are using.

18.2.26 DeltavisionReader

This page lists supported metadata fields for the Bio-Formats Deltavision format reader.

These fields are from the OME data model¹²⁶⁶. 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 : EmissionWavelength¹²⁶⁷
- Channel : ExcitationWavelength¹²⁶⁸
- Channel : ID¹²⁶⁹
- Channel : NDFilter¹²⁷⁰
- Channel : Name¹²⁷¹
- Channel : SamplesPerPixel¹²⁷²
- Detector : ID¹²⁷³
- Detector : Model¹²⁷⁴
- Detector : Type¹²⁷⁵
- DetectorSettings : Binning¹²⁷⁶

¹²⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

¹²⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

¹²⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

¹²⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

¹²⁶⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹²⁶⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹²⁶⁶<http://www.openmicroscopy.org/site/support/ome-model/>

¹²⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

¹²⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

¹²⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹²⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_NDFilter

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_SamplesPerPixel

¹²⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹²⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹²⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹²⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

- DetectorSettings : Gain¹²⁷⁷
- DetectorSettings : ID¹²⁷⁸
- DetectorSettings : ReadOutRate¹²⁷⁹
- Image : AcquisitionDate¹²⁸⁰
- Image : Description¹²⁸¹
- Image : ID¹²⁸²
- Image : InstrumentRef¹²⁸³
- Image : Name¹²⁸⁴
- ImagingEnvironment : Temperature¹²⁸⁵
- Instrument : ID¹²⁸⁶
- Objective : CalibratedMagnification¹²⁸⁷
- Objective : Correction¹²⁸⁸
- Objective : ID¹²⁸⁹
- Objective : Immersion¹²⁹⁰
- Objective : LensNA¹²⁹¹
- Objective : Manufacturer¹²⁹²
- Objective : Model¹²⁹³
- Objective : NominalMagnification¹²⁹⁴
- Objective : WorkingDistance¹²⁹⁵
- ObjectiveSettings : ID¹²⁹⁶
- Pixels : BigEndian¹²⁹⁷
- Pixels : DimensionOrder¹²⁹⁸
- Pixels : ID¹²⁹⁹
- Pixels : Interleaved¹³⁰⁰
- Pixels : PhysicalSizeX¹³⁰¹
- Pixels : PhysicalSizeY¹³⁰²

¹²⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

¹²⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹²⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

¹²⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹²⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹²⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹²⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹²⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹²⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

¹²⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹²⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

¹²⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

¹²⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹²⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

¹²⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

¹²⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

¹²⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹²⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹²⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

¹²⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹²⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹²⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹²⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹³⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹³⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹³⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

- Pixels : PhysicalSizeZ¹³⁰³
- Pixels : SignificantBits¹³⁰⁴
- Pixels : SizeC¹³⁰⁵
- Pixels : SizeT¹³⁰⁶
- Pixels : SizeX¹³⁰⁷
- Pixels : SizeY¹³⁰⁸
- Pixels : SizeZ¹³⁰⁹
- Pixels : Type¹³¹⁰
- Plane : DeltaT¹³¹¹
- Plane : ExposureTime¹³¹²
- Plane : PositionX¹³¹³
- Plane : PositionY¹³¹⁴
- Plane : PositionZ¹³¹⁵
- Plane : TheC¹³¹⁶
- Plane : TheT¹³¹⁷
- Plane : TheZ¹³¹⁸

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 version¹³¹⁹ or the previous versions¹³²⁰ page to find documentation for the version you are using.

18.2.27 DicomReader

This page lists supported metadata fields for the Bio-Formats DICOM format reader.

These fields are from the OME data model¹³²¹. 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%).

¹³⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹³⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹³⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹³⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹³⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹³⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹³⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹³¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹³¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

¹³¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹³¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹³¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹³¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

¹³¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹³¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹³¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹³¹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³²⁰<http://www.openmicroscopy.org/site/support/legacy/>

¹³²¹<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats DICOM format reader:

- Channel : ID¹³²²
- Channel : SamplesPerPixel¹³²³
- Image : AcquisitionDate¹³²⁴
- Image : Description¹³²⁵
- Image : ID¹³²⁶
- Image : Name¹³²⁷
- Pixels : BigEndian¹³²⁸
- Pixels : DimensionOrder¹³²⁹
- Pixels : ID¹³³⁰
- Pixels : Interleaved¹³³¹
- Pixels : PhysicalSizeX¹³³²
- Pixels : PhysicalSizeY¹³³³
- Pixels : PhysicalSizeZ¹³³⁴
- Pixels : SignificantBits¹³³⁵
- Pixels : SizeC¹³³⁶
- Pixels : SizeT¹³³⁷
- Pixels : SizeX¹³³⁸
- Pixels : SizeY¹³³⁹
- Pixels : SizeZ¹³⁴⁰
- Pixels : Type¹³⁴¹
- Plane : TheC¹³⁴²
- Plane : TheT¹³⁴³
- Plane : TheZ¹³⁴⁴

Total supported: 23

Total unknown or missing: 452

¹³²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹³²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹³²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹³²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹³²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹³²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹³²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹³²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹³³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹³³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹³³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹³³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹³³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹³³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹³³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹³³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹³³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹³³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹³⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹³⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹³⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹³⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹³⁴⁴http://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 version¹³⁴⁵](#) or the [previous versions¹³⁴⁶](#) page to find documentation for the version you are using.

18.2.28 Ecat7Reader

This page lists supported metadata fields for the Bio-Formats ECAT7 format reader.

These fields are from the [OME data model¹³⁴⁷](#). 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 ECAT7 format reader:

- Channel : ID¹³⁴⁸
- Channel : SamplesPerPixel¹³⁴⁹
- Image : AcquisitionDate¹³⁵⁰
- Image : Description¹³⁵¹
- Image : ID¹³⁵²
- Image : Name¹³⁵³
- Pixels : BigEndian¹³⁵⁴
- Pixels : DimensionOrder¹³⁵⁵
- Pixels : ID¹³⁵⁶
- Pixels : Interleaved¹³⁵⁷
- Pixels : PhysicalSizeX¹³⁵⁸
- Pixels : PhysicalSizeY¹³⁵⁹
- Pixels : PhysicalSizeZ¹³⁶⁰
- Pixels : SignificantBits¹³⁶¹
- Pixels : SizeC¹³⁶²
- Pixels : SizeT¹³⁶³

¹³⁴⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³⁴⁶<http://www.openmicroscopy.org/site/support/legacy/>

¹³⁴⁷<http://www.openmicroscopy.org/site/support/ome-model/>

¹³⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹³⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹³⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹³⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹³⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹³⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹³⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹³⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹³⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹³⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹³⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹³⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹³⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹³⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹³⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹³⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

- Pixels : SizeX¹³⁶⁴
- Pixels : SizeY¹³⁶⁵
- Pixels : SizeZ¹³⁶⁶
- Pixels : Type¹³⁶⁷
- Plane : TheC¹³⁶⁸
- Plane : TheT¹³⁶⁹
- Plane : TheZ¹³⁷⁰

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 version¹³⁷¹](#) or the [previous versions¹³⁷²](#) page to find documentation for the version you are using.

18.2.29 EPSReader

This page lists supported metadata fields for the Bio-Formats Encapsulated PostScript format reader.

These fields are from the [OME data model¹³⁷³](#). 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 : ID¹³⁷⁴
- Channel : SamplesPerPixel¹³⁷⁵
- Image : AcquisitionDate¹³⁷⁶
- Image : ID¹³⁷⁷
- Image : Name¹³⁷⁸
- Pixels : BigEndian¹³⁷⁹
- Pixels : DimensionOrder¹³⁸⁰

¹³⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹³⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹³⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹³⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹³⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹³⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹³⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹³⁷¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³⁷²<http://www.openmicroscopy.org/site/support/legacy/>

¹³⁷³<http://www.openmicroscopy.org/site/support/ome-model/>

¹³⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹³⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹³⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹³⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹³⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹³⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹³⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID¹³⁸¹
- Pixels : Interleaved¹³⁸²
- Pixels : SignificantBits¹³⁸³
- Pixels : SizeC¹³⁸⁴
- Pixels : SizeT¹³⁸⁵
- Pixels : SizeX¹³⁸⁶
- Pixels : SizeY¹³⁸⁷
- Pixels : SizeZ¹³⁸⁸
- Pixels : Type¹³⁸⁹
- Plane : TheC¹³⁹⁰
- Plane : TheT¹³⁹¹
- Plane : TheZ¹³⁹²

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 version¹³⁹³](#) or the [previous versions¹³⁹⁴](#) page to find documentation for the version you are using.

18.2.30 FlexReader

This page lists supported metadata fields for the Bio-Formats Evotec Flex format reader.

These fields are from the [OME data model¹³⁹⁵](#). 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 : ID¹³⁹⁶
- Channel : LightSourceSettingsID¹³⁹⁷

¹³⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹³⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹³⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹³⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹³⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹³⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹³⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹³⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹³⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹³⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹³⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹³⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹³⁹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹³⁹⁴<http://www.openmicroscopy.org/site/support/legacy/>

¹³⁹⁵<http://www.openmicroscopy.org/site/support/ome-model/>

¹³⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹³⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID

- Channel : Name¹³⁹⁸
- Channel : SamplesPerPixel¹³⁹⁹
- Detector : ID¹⁴⁰⁰
- Detector : Type¹⁴⁰¹
- DetectorSettings : Binning¹⁴⁰²
- DetectorSettings : ID¹⁴⁰³
- Dichroic : ID¹⁴⁰⁴
- Dichroic : Model¹⁴⁰⁵
- Filter : FilterWheel¹⁴⁰⁶
- Filter : ID¹⁴⁰⁷
- Filter : Model¹⁴⁰⁸
- Image : AcquisitionDate¹⁴⁰⁹
- Image : ID¹⁴¹⁰
- Image : InstrumentRef¹⁴¹¹
- Image : Name¹⁴¹²
- Instrument : ID¹⁴¹³
- Laser : ID¹⁴¹⁴
- Laser : LaserMedium¹⁴¹⁵
- Laser : Type¹⁴¹⁶
- Laser : Wavelength¹⁴¹⁷
- LightPath : DichroicRef¹⁴¹⁸
- LightPath : EmissionFilterRef¹⁴¹⁹
- LightPath : ExcitationFilterRef¹⁴²⁰
- Objective : CalibratedMagnification¹⁴²¹
- Objective : Correction¹⁴²²
- Objective : ID¹⁴²³

¹³⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

¹³⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁴⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁴⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹⁴⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

¹⁴⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹⁴⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

¹⁴⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁴⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_FilterWheel

¹⁴⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

¹⁴⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁴⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁴¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁴¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁴¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁴¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁴¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

¹⁴¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

¹⁴¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

¹⁴¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

¹⁴¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID

¹⁴¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

¹⁴²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

¹⁴²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

¹⁴²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

¹⁴²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

- Objective : Immersion¹⁴²⁴
- Objective : LensNA¹⁴²⁵
- ObjectiveSettings : ID¹⁴²⁶
- Pixels : BigEndian¹⁴²⁷
- Pixels : DimensionOrder¹⁴²⁸
- Pixels : ID¹⁴²⁹
- Pixels : Interleaved¹⁴³⁰
- Pixels : PhysicalSizeX¹⁴³¹
- Pixels : PhysicalSizeY¹⁴³²
- Pixels : SignificantBits¹⁴³³
- Pixels : SizeC¹⁴³⁴
- Pixels : SizeT¹⁴³⁵
- Pixels : SizeX¹⁴³⁶
- Pixels : SizeY¹⁴³⁷
- Pixels : SizeZ¹⁴³⁸
- Pixels : Type¹⁴³⁹
- Plane : DeltaT¹⁴⁴⁰
- Plane : ExposureTime¹⁴⁴¹
- Plane : PositionX¹⁴⁴²
- Plane : PositionY¹⁴⁴³
- Plane : PositionZ¹⁴⁴⁴
- Plane : TheC¹⁴⁴⁵
- Plane : TheT¹⁴⁴⁶
- Plane : TheZ¹⁴⁴⁷
- Plate : ColumnNamingConvention¹⁴⁴⁸
- Plate : ExternalIdentifier¹⁴⁴⁹

¹⁴²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

¹⁴²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

¹⁴²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁴²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁴²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁴²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁴³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁴³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁴³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁴³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁴³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁴³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁴³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁴³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁴³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁴³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁴⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

¹⁴⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹⁴⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹⁴⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹⁴⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

¹⁴⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁴⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁴⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁴⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

¹⁴⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ExternalIdentifier

- Plate : ID¹⁴⁵⁰
- Plate : Name¹⁴⁵¹
- Plate : RowNamingConvention¹⁴⁵²
- PlateAcquisition : ID¹⁴⁵³
- PlateAcquisition : MaximumFieldCount¹⁴⁵⁴
- PlateAcquisition : StartTime¹⁴⁵⁵
- PlateAcquisition : WellSampleRef¹⁴⁵⁶
- Well : Column¹⁴⁵⁷
- Well : ID¹⁴⁵⁸
- Well : Row¹⁴⁵⁹
- WellSample : ID¹⁴⁶⁰
- WellSample : ImageRef¹⁴⁶¹
- WellSample : Index¹⁴⁶²
- WellSample : PositionX¹⁴⁶³
- WellSample : PositionY¹⁴⁶⁴

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 version¹⁴⁶⁵ or the previous versions¹⁴⁶⁶ page to find documentation for the version you are using.

18.2.31 FEIReader

This page lists supported metadata fields for the Bio-Formats FEI/Philips format reader.

These fields are from the OME data model¹⁴⁶⁷. 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%).

¹⁴⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

¹⁴⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

¹⁴⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

¹⁴⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

¹⁴⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

¹⁴⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_StartTime

¹⁴⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

¹⁴⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

¹⁴⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

¹⁴⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

¹⁴⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

¹⁴⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

¹⁴⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

¹⁴⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

¹⁴⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

¹⁴⁶⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁴⁶⁶<http://www.openmicroscopy.org/site/support/legacy/>

¹⁴⁶⁷<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats FEI/Philips format reader:

- Channel : ID¹⁴⁶⁸
- Channel : SamplesPerPixel¹⁴⁶⁹
- Image : AcquisitionDate¹⁴⁷⁰
- Image : ID¹⁴⁷¹
- Image : Name¹⁴⁷²
- Pixels : BigEndian¹⁴⁷³
- Pixels : DimensionOrder¹⁴⁷⁴
- Pixels : ID¹⁴⁷⁵
- Pixels : Interleaved¹⁴⁷⁶
- Pixels : SignificantBits¹⁴⁷⁷
- Pixels : SizeC¹⁴⁷⁸
- Pixels : SizeT¹⁴⁷⁹
- Pixels : SizeX¹⁴⁸⁰
- Pixels : SizeY¹⁴⁸¹
- Pixels : SizeZ¹⁴⁸²
- Pixels : Type¹⁴⁸³
- Plane : TheC¹⁴⁸⁴
- Plane : TheT¹⁴⁸⁵
- Plane : TheZ¹⁴⁸⁶

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 version¹⁴⁸⁷ or the previous versions¹⁴⁸⁸ page to find documentation for the version you are using.

- ¹⁴⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID
- ¹⁴⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel
- ¹⁴⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate
- ¹⁴⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ¹⁴⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ¹⁴⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ¹⁴⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ¹⁴⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ¹⁴⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ¹⁴⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ¹⁴⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ¹⁴⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ¹⁴⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ¹⁴⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ¹⁴⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ¹⁴⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ¹⁴⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ¹⁴⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ¹⁴⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ¹⁴⁸⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ¹⁴⁸⁸<http://www.openmicroscopy.org/site/support/legacy/>

18.2.32 FEITiffReader

This page lists supported metadata fields for the Bio-Formats FEI TIFF format reader.

These fields are from the [OME data model](#)¹⁴⁸⁹. 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 : ID¹⁴⁹⁰
- Channel : SamplesPerPixel¹⁴⁹¹
- Detector : ID¹⁴⁹²
- Detector : Model¹⁴⁹³
- Detector : Type¹⁴⁹⁴
- Experimenter : ID¹⁴⁹⁵
- Experimenter : LastName¹⁴⁹⁶
- Image : AcquisitionDate¹⁴⁹⁷
- Image : Description¹⁴⁹⁸
- Image : ID¹⁴⁹⁹
- Image : InstrumentRef¹⁵⁰⁰
- Image : Name¹⁵⁰¹
- Instrument : ID¹⁵⁰²
- Microscope : Model¹⁵⁰³
- Objective : Correction¹⁵⁰⁴
- Objective : ID¹⁵⁰⁵
- Objective : Immersion¹⁵⁰⁶
- Objective : NominalMagnification¹⁵⁰⁷
- Pixels : BigEndian¹⁵⁰⁸

¹⁴⁸⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁴⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁴⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁴⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁴⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁴⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹⁴⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

¹⁴⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

¹⁴⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁴⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹⁴⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁵⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁵⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁵⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁵⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁵⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

¹⁵⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁵⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

¹⁵⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹⁵⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

- Pixels : DimensionOrder¹⁵⁰⁹
- Pixels : ID¹⁵¹⁰
- Pixels : Interleaved¹⁵¹¹
- Pixels : PhysicalSizeX¹⁵¹²
- Pixels : PhysicalSizeY¹⁵¹³
- Pixels : SignificantBits¹⁵¹⁴
- Pixels : SizeC¹⁵¹⁵
- Pixels : SizeT¹⁵¹⁶
- Pixels : SizeX¹⁵¹⁷
- Pixels : SizeY¹⁵¹⁸
- Pixels : SizeZ¹⁵¹⁹
- Pixels : TimeIncrement¹⁵²⁰
- Pixels : Type¹⁵²¹
- Plane : TheC¹⁵²²
- Plane : TheT¹⁵²³
- Plane : TheZ¹⁵²⁴
- StageLabel : Name¹⁵²⁵
- StageLabel : X¹⁵²⁶
- StageLabel : Y¹⁵²⁷
- StageLabel : Z¹⁵²⁸

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 version¹⁵²⁹ or the previous versions¹⁵³⁰ page to find documentation for the version you are using.

18.2.33 FitsReader

This page lists supported metadata fields for the Bio-Formats Flexible Image Transport System format reader.

¹⁵⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁵¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁵¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁵¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁵¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁵¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁵¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁵¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁵¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁵¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁵¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁵²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

¹⁵²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁵²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁵²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁵²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁵²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Name

¹⁵²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_X

¹⁵²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Y

¹⁵²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Z

¹⁵²⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁵³⁰<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)¹⁵³¹. 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 : ID¹⁵³²
- Channel : SamplesPerPixel¹⁵³³
- Image : AcquisitionDate¹⁵³⁴
- Image : ID¹⁵³⁵
- Image : Name¹⁵³⁶
- Pixels : BigEndian¹⁵³⁷
- Pixels : DimensionOrder¹⁵³⁸
- Pixels : ID¹⁵³⁹
- Pixels : Interleaved¹⁵⁴⁰
- Pixels : SignificantBits¹⁵⁴¹
- Pixels : SizeC¹⁵⁴²
- Pixels : SizeT¹⁵⁴³
- Pixels : SizeX¹⁵⁴⁴
- Pixels : SizeY¹⁵⁴⁵
- Pixels : SizeZ¹⁵⁴⁶
- Pixels : Type¹⁵⁴⁷
- Plane : TheC¹⁵⁴⁸
- Plane : TheT¹⁵⁴⁹
- Plane : TheZ¹⁵⁵⁰

¹⁵³¹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁵³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁵³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁵³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁵³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁵³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁵³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁵³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁵³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁵⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁵⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁵⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁵⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁵⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁵⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁵⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁵⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁵⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁵⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁵⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

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 version¹⁵⁵¹](#) or the [previous versions¹⁵⁵²](#) page to find documentation for the version you are using.

18.2.34 GatanDM2Reader

This page lists supported metadata fields for the Bio-Formats Gatan DM2 format reader.

These fields are from the [OME data model¹⁵⁵³](#). 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 Gatan DM2 format reader:

- Channel : ID¹⁵⁵⁴
- Channel : SamplesPerPixel¹⁵⁵⁵
- Detector : ID¹⁵⁵⁶
- DetectorSettings : Binning¹⁵⁵⁷
- DetectorSettings : ID¹⁵⁵⁸
- Experimenter : FirstName¹⁵⁵⁹
- Experimenter : ID¹⁵⁶⁰
- Experimenter : LastName¹⁵⁶¹
- Image : AcquisitionDate¹⁵⁶²
- Image : ExperimenterRef¹⁵⁶³
- Image : ID¹⁵⁶⁴
- Image : InstrumentRef¹⁵⁶⁵
- Image : Name¹⁵⁶⁶
- Instrument : ID¹⁵⁶⁷

¹⁵⁵¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁵⁵²<http://www.openmicroscopy.org/site/support/legacy/>

¹⁵⁵³<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁵⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁵⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁵⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁵⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

¹⁵⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹⁵⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_FirstName

¹⁵⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

¹⁵⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

¹⁵⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁵⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID

¹⁵⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁵⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁵⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁵⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

- Pixels : BigEndian¹⁵⁶⁸
- Pixels : DimensionOrder¹⁵⁶⁹
- Pixels : ID¹⁵⁷⁰
- Pixels : Interleaved¹⁵⁷¹
- Pixels : PhysicalSizeX¹⁵⁷²
- Pixels : PhysicalSizeY¹⁵⁷³
- Pixels : SignificantBits¹⁵⁷⁴
- Pixels : SizeC¹⁵⁷⁵
- Pixels : SizeT¹⁵⁷⁶
- Pixels : SizeX¹⁵⁷⁷
- Pixels : SizeY¹⁵⁷⁸
- Pixels : SizeZ¹⁵⁷⁹
- Pixels : Type¹⁵⁸⁰
- Plane : TheC¹⁵⁸¹
- Plane : TheT¹⁵⁸²
- Plane : TheZ¹⁵⁸³

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 version¹⁵⁸⁴ or the previous versions¹⁵⁸⁵ page to find documentation for the version you are using.

18.2.35 GatanReader

This page lists supported metadata fields for the Bio-Formats Gatan Digital Micrograph format reader.

These fields are from the OME data model¹⁵⁸⁶. 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%).

¹⁵⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁵⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁵⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁵⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁵⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁵⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁵⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁵⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁵⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁵⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁵⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁵⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁵⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁵⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁵⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁵⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁵⁸⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁵⁸⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹⁵⁸⁶<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Gatan Digital Micrograph format reader:

- Channel : AcquisitionMode¹⁵⁸⁷
- Channel : ID¹⁵⁸⁸
- Channel : SamplesPerPixel¹⁵⁸⁹
- Detector : ID¹⁵⁹⁰
- DetectorSettings : ID¹⁵⁹¹
- DetectorSettings : Voltage¹⁵⁹²
- Image : AcquisitionDate¹⁵⁹³
- Image : ID¹⁵⁹⁴
- Image : Name¹⁵⁹⁵
- Instrument : ID¹⁵⁹⁶
- Objective : Correction¹⁵⁹⁷
- Objective : ID¹⁵⁹⁸
- Objective : Immersion¹⁵⁹⁹
- Objective : NominalMagnification¹⁶⁰⁰
- ObjectiveSettings : ID¹⁶⁰¹
- Pixels : BigEndian¹⁶⁰²
- Pixels : DimensionOrder¹⁶⁰³
- Pixels : ID¹⁶⁰⁴
- Pixels : Interleaved¹⁶⁰⁵
- Pixels : PhysicalSizeX¹⁶⁰⁶
- Pixels : PhysicalSizeY¹⁶⁰⁷
- Pixels : PhysicalSizeZ¹⁶⁰⁸
- Pixels : SignificantBits¹⁶⁰⁹
- Pixels : SizeC¹⁶¹⁰

¹⁵⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_AcquisitionMode

¹⁵⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁵⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁵⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁵⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹⁵⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

¹⁵⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁵⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁵⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁵⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁵⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

¹⁵⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁵⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

¹⁶⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹⁶⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁶⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁶⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁶⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁶⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁶⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁶⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁶⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹⁶⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁶¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT¹⁶¹¹
- Pixels : SizeX¹⁶¹²
- Pixels : SizeY¹⁶¹³
- Pixels : SizeZ¹⁶¹⁴
- Pixels : Type¹⁶¹⁵
- Plane : ExposureTime¹⁶¹⁶
- Plane : PositionX¹⁶¹⁷
- Plane : PositionY¹⁶¹⁸
- Plane : PositionZ¹⁶¹⁹
- Plane : TheC¹⁶²⁰
- Plane : TheT¹⁶²¹
- Plane : TheZ¹⁶²²

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 version¹⁶²³ or the previous versions¹⁶²⁴ page to find documentation for the version you are using.

18.2.36 GIFReader

This page lists supported metadata fields for the Bio-Formats Graphics Interchange Format format reader.

These fields are from the OME data model¹⁶²⁵. 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 : ID¹⁶²⁶
- Channel : SamplesPerPixel¹⁶²⁷

¹⁶¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁶¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁶¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁶¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁶¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁶¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹⁶¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹⁶¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹⁶¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

¹⁶²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁶²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁶²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁶²³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁶²⁴<http://www.openmicroscopy.org/site/support/legacy/>

¹⁶²⁵<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁶²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁶²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

- Image : AcquisitionDate¹⁶²⁸
- Image : ID¹⁶²⁹
- Image : Name¹⁶³⁰
- Pixels : BigEndian¹⁶³¹
- Pixels : DimensionOrder¹⁶³²
- Pixels : ID¹⁶³³
- Pixels : Interleaved¹⁶³⁴
- Pixels : SignificantBits¹⁶³⁵
- Pixels : SizeC¹⁶³⁶
- Pixels : SizeT¹⁶³⁷
- Pixels : SizeX¹⁶³⁸
- Pixels : SizeY¹⁶³⁹
- Pixels : SizeZ¹⁶⁴⁰
- Pixels : Type¹⁶⁴¹
- Plane : TheC¹⁶⁴²
- Plane : TheT¹⁶⁴³
- Plane : TheZ¹⁶⁴⁴

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 version¹⁶⁴⁵ or the previous versions¹⁶⁴⁶ page to find documentation for the version you are using.

18.2.37 NAFReader

This page lists supported metadata fields for the Bio-Formats Hamamatsu Aquacosmos format reader.

These fields are from the OME data model¹⁶⁴⁷. 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%).

¹⁶²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁶²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁶³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁶³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁶³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁶³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁶³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁶³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁶³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁶³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁶³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁶³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁶⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁶⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁶⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁶⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁶⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁶⁴⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁶⁴⁶<http://www.openmicroscopy.org/site/support/legacy/>

¹⁶⁴⁷<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 Hamamatsu Aquacosmos format reader:

- Channel : ID¹⁶⁴⁸
- Channel : SamplesPerPixel¹⁶⁴⁹
- Image : AcquisitionDate¹⁶⁵⁰
- Image : ID¹⁶⁵¹
- Image : Name¹⁶⁵²
- Pixels : BigEndian¹⁶⁵³
- Pixels : DimensionOrder¹⁶⁵⁴
- Pixels : ID¹⁶⁵⁵
- Pixels : Interleaved¹⁶⁵⁶
- Pixels : SignificantBits¹⁶⁵⁷
- Pixels : SizeC¹⁶⁵⁸
- Pixels : SizeT¹⁶⁵⁹
- Pixels : SizeX¹⁶⁶⁰
- Pixels : SizeY¹⁶⁶¹
- Pixels : SizeZ¹⁶⁶²
- Pixels : Type¹⁶⁶³
- Plane : TheC¹⁶⁶⁴
- Plane : TheT¹⁶⁶⁵
- Plane : TheZ¹⁶⁶⁶

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 version¹⁶⁶⁷ or the previous versions¹⁶⁶⁸ page to find documentation for the version you are using.

¹⁶⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁶⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁶⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁶⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁶⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁶⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁶⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁶⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁶⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁶⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁶⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁶⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁶⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁶⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁶⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁶⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁶⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁶⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁶⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁶⁶⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁶⁶⁸<http://www.openmicroscopy.org/site/support/legacy/>

18.2.38 HISReader

This page lists supported metadata fields for the Bio-Formats Hamamatsu HIS format reader.

These fields are from the [OME data model](#)¹⁶⁶⁹. 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 : ID¹⁶⁷⁰
- Channel : SamplesPerPixel¹⁶⁷¹
- Detector : ID¹⁶⁷²
- Detector : Offset¹⁶⁷³
- Detector : Type¹⁶⁷⁴
- DetectorSettings : Binning¹⁶⁷⁵
- DetectorSettings : ID¹⁶⁷⁶
- Image : AcquisitionDate¹⁶⁷⁷
- Image : ID¹⁶⁷⁸
- Image : InstrumentRef¹⁶⁷⁹
- Image : Name¹⁶⁸⁰
- Instrument : ID¹⁶⁸¹
- Pixels : BigEndian¹⁶⁸²
- Pixels : DimensionOrder¹⁶⁸³
- Pixels : ID¹⁶⁸⁴
- Pixels : Interleaved¹⁶⁸⁵
- Pixels : SignificantBits¹⁶⁸⁶
- Pixels : SizeC¹⁶⁸⁷

¹⁶⁶⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁶⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁶⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁶⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁶⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

¹⁶⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹⁶⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

¹⁶⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹⁶⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁶⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁶⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁶⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁶⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁶⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁶⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁶⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁶⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁶⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁶⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

- Pixels : SizeT¹⁶⁸⁸
- Pixels : SizeX¹⁶⁸⁹
- Pixels : SizeY¹⁶⁹⁰
- Pixels : SizeZ¹⁶⁹¹
- Pixels : Type¹⁶⁹²
- Plane : ExposureTime¹⁶⁹³
- Plane : TheC¹⁶⁹⁴
- Plane : TheT¹⁶⁹⁵
- Plane : TheZ¹⁶⁹⁶

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 version¹⁶⁹⁷](#) or the [previous versions¹⁶⁹⁸](#) page to find documentation for the version you are using.

18.2.39 NDPIReader

This page lists supported metadata fields for the Bio-Formats Hamamatsu NDPI format reader.

These fields are from the [OME data model¹⁶⁹⁹](#). 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 : ID¹⁷⁰⁰
- Channel : SamplesPerPixel¹⁷⁰¹
- Image : AcquisitionDate¹⁷⁰²
- Image : Description¹⁷⁰³
- Image : ID¹⁷⁰⁴

¹⁶⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁶⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁶⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁶⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁶⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁶⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹⁶⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁶⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁶⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁶⁹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁶⁹⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁶⁹⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁷⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁷⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁷⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁷⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹⁷⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : InstrumentRef¹⁷⁰⁵
- Image : Name¹⁷⁰⁶
- Instrument : ID¹⁷⁰⁷
- Microscope : Model¹⁷⁰⁸
- Objective : ID¹⁷⁰⁹
- Objective : NominalMagnification¹⁷¹⁰
- ObjectiveSettings : ID¹⁷¹¹
- Pixels : BigEndian¹⁷¹²
- Pixels : DimensionOrder¹⁷¹³
- Pixels : ID¹⁷¹⁴
- Pixels : Interleaved¹⁷¹⁵
- Pixels : PhysicalSizeX¹⁷¹⁶
- Pixels : PhysicalSizeY¹⁷¹⁷
- Pixels : SignificantBits¹⁷¹⁸
- Pixels : SizeC¹⁷¹⁹
- Pixels : SizeT¹⁷²⁰
- Pixels : SizeX¹⁷²¹
- Pixels : SizeY¹⁷²²
- Pixels : SizeZ¹⁷²³
- Pixels : Type¹⁷²⁴
- Plane : TheC¹⁷²⁵
- Plane : TheT¹⁷²⁶
- Plane : TheZ¹⁷²⁷

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 version¹⁷²⁸ or the previous versions¹⁷²⁹ page to find documentation for the version you are using.

¹⁷⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁷⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁷⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁷⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁷⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁷¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹⁷¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁷¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁷¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁷¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁷¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁷¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁷¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁷¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁷¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁷²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁷²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁷²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁷²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁷²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁷²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁷²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁷²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁷²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁷²⁹<http://www.openmicroscopy.org/site/support/legacy/>

18.2.40 HamamatsuVMSReader

This page lists supported metadata fields for the Bio-Formats Hamamatsu VMS format reader.

These fields are from the [OME data model](#)¹⁷³⁰. 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:

- Channel : ID¹⁷³¹
- Channel : SamplesPerPixel¹⁷³²
- Image : AcquisitionDate¹⁷³³
- Image : ID¹⁷³⁴
- Image : InstrumentRef¹⁷³⁵
- Image : Name¹⁷³⁶
- Instrument : ID¹⁷³⁷
- Objective : ID¹⁷³⁸
- Objective : NominalMagnification¹⁷³⁹
- ObjectiveSettings : ID¹⁷⁴⁰
- Pixels : BigEndian¹⁷⁴¹
- Pixels : DimensionOrder¹⁷⁴²
- Pixels : ID¹⁷⁴³
- Pixels : Interleaved¹⁷⁴⁴
- Pixels : PhysicalSizeX¹⁷⁴⁵
- Pixels : PhysicalSizeY¹⁷⁴⁶
- Pixels : SignificantBits¹⁷⁴⁷

¹⁷³⁰<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁷³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁷³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁷³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁷³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁷³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁷³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁷³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁷³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁷³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

¹⁷⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁷⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁷⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁷⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁷⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁷⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁷⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁷⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

- Pixels : SizeC¹⁷⁴⁸
- Pixels : SizeT¹⁷⁴⁹
- Pixels : SizeX¹⁷⁵⁰
- Pixels : SizeY¹⁷⁵¹
- Pixels : SizeZ¹⁷⁵²
- Pixels : Type¹⁷⁵³
- Plane : TheC¹⁷⁵⁴
- Plane : TheT¹⁷⁵⁵
- Plane : TheZ¹⁷⁵⁶

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 version¹⁷⁵⁷](#) or the [previous versions¹⁷⁵⁸](#) page to find documentation for the version you are using.

18.2.41 HitachiReader

This page lists supported metadata fields for the Bio-Formats Hitachi format reader.

These fields are from the [OME data model¹⁷⁵⁹](#). 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 : ID¹⁷⁶⁰
- Channel : SamplesPerPixel¹⁷⁶¹
- Image : AcquisitionDate¹⁷⁶²
- Image : ID¹⁷⁶³
- Image : InstrumentRef¹⁷⁶⁴

¹⁷⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁷⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁷⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁷⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁷⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁷⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁷⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁷⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁷⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁷⁵⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁷⁵⁸<http://www.openmicroscopy.org/site/support/legacy/>

¹⁷⁵⁹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁷⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁷⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁷⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁷⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁷⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

- Image : Name¹⁷⁶⁵
- Instrument : ID¹⁷⁶⁶
- Microscope : Model¹⁷⁶⁷
- Microscope : SerialNumber¹⁷⁶⁸
- Objective : ID¹⁷⁶⁹
- Objective : WorkingDistance¹⁷⁷⁰
- ObjectiveSettings : ID¹⁷⁷¹
- Pixels : BigEndian¹⁷⁷²
- Pixels : DimensionOrder¹⁷⁷³
- Pixels : ID¹⁷⁷⁴
- Pixels : Interleaved¹⁷⁷⁵
- Pixels : PhysicalSizeX¹⁷⁷⁶
- Pixels : PhysicalSizeY¹⁷⁷⁷
- Pixels : SignificantBits¹⁷⁷⁸
- Pixels : SizeC¹⁷⁷⁹
- Pixels : SizeT¹⁷⁸⁰
- Pixels : SizeX¹⁷⁸¹
- Pixels : SizeY¹⁷⁸²
- Pixels : SizeZ¹⁷⁸³
- Pixels : Type¹⁷⁸⁴
- Plane : PositionX¹⁷⁸⁵
- Plane : PositionY¹⁷⁸⁶
- Plane : PositionZ¹⁷⁸⁷
- Plane : TheC¹⁷⁸⁸
- Plane : TheT¹⁷⁸⁹
- Plane : TheZ¹⁷⁹⁰

¹⁷⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁷⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁷⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁷⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

¹⁷⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁷⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

¹⁷⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁷⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁷⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁷⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁷⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁷⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁷⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁷⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁷⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁷⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁷⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁷⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁷⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁷⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁷⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹⁷⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹⁷⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

¹⁷⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁷⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁷⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

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 version¹⁷⁹¹ or the previous versions¹⁷⁹² page to find documentation for the version you are using.

18.2.42 I2IReader

This page lists supported metadata fields for the Bio-Formats I2I format reader.

These fields are from the OME data model¹⁷⁹³. 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 I2I format reader:

- Channel : ID¹⁷⁹⁴
- Channel : SamplesPerPixel¹⁷⁹⁵
- Image : AcquisitionDate¹⁷⁹⁶
- Image : ID¹⁷⁹⁷
- Image : Name¹⁷⁹⁸
- Pixels : BigEndian¹⁷⁹⁹
- Pixels : DimensionOrder¹⁸⁰⁰
- Pixels : ID¹⁸⁰¹
- Pixels : Interleaved¹⁸⁰²
- Pixels : SignificantBits¹⁸⁰³
- Pixels : SizeC¹⁸⁰⁴
- Pixels : SizeT¹⁸⁰⁵
- Pixels : SizeX¹⁸⁰⁶
- Pixels : SizeY¹⁸⁰⁷

¹⁷⁹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁷⁹²<http://www.openmicroscopy.org/site/support/legacy/>

¹⁷⁹³<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁷⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁷⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁷⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁷⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁷⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁷⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁸⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁸⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁸⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁸⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁸⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁸⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁸⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁸⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ¹⁸⁰⁸
- Pixels : Type¹⁸⁰⁹
- Plane : TheC¹⁸¹⁰
- Plane : TheT¹⁸¹¹
- Plane : TheZ¹⁸¹²

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 version¹⁸¹³](#) or the [previous versions¹⁸¹⁴](#) page to find documentation for the version you are using.

18.2.43 ICSReader

This page lists supported metadata fields for the Bio-Formats Image Cytometry Standard format reader.

These fields are from the [OME data model¹⁸¹⁵](#). 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 : EmissionWavelength¹⁸¹⁶
- Channel : ExcitationWavelength¹⁸¹⁷
- Channel : ID¹⁸¹⁸
- Channel : Name¹⁸¹⁹
- Channel : PinholeSize¹⁸²⁰
- Channel : SamplesPerPixel¹⁸²¹
- Detector : ID¹⁸²²
- Detector : Manufacturer¹⁸²³
- Detector : Model¹⁸²⁴

¹⁸⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁸⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁸¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁸¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁸¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁸¹³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁸¹⁴<http://www.openmicroscopy.org/site/support/legacy/>

¹⁸¹⁵<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁸¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

¹⁸¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

¹⁸¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁸¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

¹⁸²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

¹⁸²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁸²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

¹⁸²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

¹⁸²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

- Detector : Type¹⁸²⁵
- DetectorSettings : Gain¹⁸²⁶
- DetectorSettings : ID¹⁸²⁷
- Dichroic : ID¹⁸²⁸
- Dichroic : Model¹⁸²⁹
- Experiment : ID¹⁸³⁰
- Experiment : Type¹⁸³¹
- Experimenter : ID¹⁸³²
- Experimenter : LastName¹⁸³³
- Filter : ID¹⁸³⁴
- Filter : Model¹⁸³⁵
- FilterSet : DichroicRef¹⁸³⁶
- FilterSet : EmissionFilterRef¹⁸³⁷
- FilterSet : ExcitationFilterRef¹⁸³⁸
- FilterSet : ID¹⁸³⁹
- FilterSet : Model¹⁸⁴⁰
- Image : AcquisitionDate¹⁸⁴¹
- Image : Description¹⁸⁴²
- Image : ID¹⁸⁴³
- Image : InstrumentRef¹⁸⁴⁴
- Image : Name¹⁸⁴⁵
- Instrument : ID¹⁸⁴⁶
- Laser : ID¹⁸⁴⁷
- Laser : LaserMedium¹⁸⁴⁸
- Laser : Manufacturer¹⁸⁴⁹
- Laser : Model¹⁸⁵⁰

¹⁸²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

¹⁸²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

¹⁸²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

¹⁸²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

¹⁸²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID

¹⁸³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type

¹⁸³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

¹⁸³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

¹⁸³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

¹⁸³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID

¹⁸³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

¹⁸³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

¹⁸³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterSet_ID

¹⁸⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁸⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹⁸⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁸⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

¹⁸⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁸⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

¹⁸⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

¹⁸⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

¹⁸⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

¹⁸⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

- Laser : Power¹⁸⁵¹
- Laser : RepetitionRate¹⁸⁵²
- Laser : Type¹⁸⁵³
- Laser : Wavelength¹⁸⁵⁴
- Microscope : Manufacturer¹⁸⁵⁵
- Microscope : Model¹⁸⁵⁶
- Objective : CalibratedMagnification¹⁸⁵⁷
- Objective : Correction¹⁸⁵⁸
- Objective : ID¹⁸⁵⁹
- Objective : Immersion¹⁸⁶⁰
- Objective : LensNA¹⁸⁶¹
- Objective : Model¹⁸⁶²
- Objective : WorkingDistance¹⁸⁶³
- ObjectiveSettings : ID¹⁸⁶⁴
- Pixels : BigEndian¹⁸⁶⁵
- Pixels : DimensionOrder¹⁸⁶⁶
- Pixels : ID¹⁸⁶⁷
- Pixels : Interleaved¹⁸⁶⁸
- Pixels : PhysicalSizeX¹⁸⁶⁹
- Pixels : PhysicalSizeY¹⁸⁷⁰
- Pixels : PhysicalSizeZ¹⁸⁷¹
- Pixels : SignificantBits¹⁸⁷²
- Pixels : SizeC¹⁸⁷³
- Pixels : SizeT¹⁸⁷⁴
- Pixels : SizeX¹⁸⁷⁵
- Pixels : SizeY¹⁸⁷⁶

¹⁸⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

¹⁸⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_RepetitionRate

¹⁸⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

¹⁸⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

¹⁸⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

¹⁸⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

¹⁸⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

¹⁸⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

¹⁸⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

¹⁸⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

¹⁸⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

¹⁸⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

¹⁸⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

¹⁸⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁸⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁸⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁸⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁸⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁸⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁸⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹⁸⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁸⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁸⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁸⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁸⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ¹⁸⁷⁷
- Pixels : TimeIncrement¹⁸⁷⁸
- Pixels : Type¹⁸⁷⁹
- Plane : DeltaT¹⁸⁸⁰
- Plane : ExposureTime¹⁸⁸¹
- Plane : PositionX¹⁸⁸²
- Plane : PositionY¹⁸⁸³
- Plane : PositionZ¹⁸⁸⁴
- Plane : TheC¹⁸⁸⁵
- Plane : TheT¹⁸⁸⁶
- Plane : TheZ¹⁸⁸⁷

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 version¹⁸⁸⁸](#) or the [previous versions¹⁸⁸⁹](#) page to find documentation for the version you are using.

18.2.44 ImaconReader

This page lists supported metadata fields for the Bio-Formats Imacon format reader.

These fields are from the [OME data model¹⁸⁹⁰](#). 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 : ID¹⁸⁹¹
- Channel : SamplesPerPixel¹⁸⁹²
- Experimenter : FirstName¹⁸⁹³

¹⁸⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁸⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

¹⁸⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁸⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

¹⁸⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

¹⁸⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

¹⁸⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

¹⁸⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

¹⁸⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁸⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁸⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁸⁸⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁸⁸⁹<http://www.openmicroscopy.org/site/support/legacy/>

¹⁸⁹⁰<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁸⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁸⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁸⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_FirstName

- Experimenter : ID¹⁸⁹⁴
- Experimenter : LastName¹⁸⁹⁵
- Image : AcquisitionDate¹⁸⁹⁶
- Image : ExperimenterRef¹⁸⁹⁷
- Image : ID¹⁸⁹⁸
- Image : Name¹⁸⁹⁹
- Pixels : BigEndian¹⁹⁰⁰
- Pixels : DimensionOrder¹⁹⁰¹
- Pixels : ID¹⁹⁰²
- Pixels : Interleaved¹⁹⁰³
- Pixels : SignificantBits¹⁹⁰⁴
- Pixels : SizeC¹⁹⁰⁵
- Pixels : SizeT¹⁹⁰⁶
- Pixels : SizeX¹⁹⁰⁷
- Pixels : SizeY¹⁹⁰⁸
- Pixels : SizeZ¹⁹⁰⁹
- Pixels : Type¹⁹¹⁰
- Plane : TheC¹⁹¹¹
- Plane : TheT¹⁹¹²
- Plane : TheZ¹⁹¹³

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 version¹⁹¹⁴ or the previous versions¹⁹¹⁵ page to find documentation for the version you are using.

18.2.45 SEQReader

This page lists supported metadata fields for the Bio-Formats Image-Pro Sequence format reader.

- ¹⁸⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID
- ¹⁸⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName
- ¹⁸⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate
- ¹⁸⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID
- ¹⁸⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ¹⁸⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ¹⁹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ¹⁹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ¹⁹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ¹⁹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ¹⁹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ¹⁹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ¹⁹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ¹⁹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ¹⁹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ¹⁹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ¹⁹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ¹⁹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ¹⁹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ¹⁹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ¹⁹¹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ¹⁹¹⁵<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)¹⁹¹⁶. 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 : ID¹⁹¹⁷
- Channel : SamplesPerPixel¹⁹¹⁸
- Image : AcquisitionDate¹⁹¹⁹
- Image : ID¹⁹²⁰
- Image : Name¹⁹²¹
- Pixels : BigEndian¹⁹²²
- Pixels : DimensionOrder¹⁹²³
- Pixels : ID¹⁹²⁴
- Pixels : Interleaved¹⁹²⁵
- Pixels : SignificantBits¹⁹²⁶
- Pixels : SizeC¹⁹²⁷
- Pixels : SizeT¹⁹²⁸
- Pixels : SizeX¹⁹²⁹
- Pixels : SizeY¹⁹³⁰
- Pixels : SizeZ¹⁹³¹
- Pixels : Type¹⁹³²
- Plane : TheC¹⁹³³
- Plane : TheT¹⁹³⁴
- Plane : TheZ¹⁹³⁵

¹⁹¹⁶<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

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 version¹⁹³⁶](#) or the [previous versions¹⁹³⁷](#) page to find documentation for the version you are using.

18.2.46 IPWReader

This page lists supported metadata fields for the Bio-Formats Image-Pro Workspace format reader.

These fields are from the [OME data model¹⁹³⁸](#). 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 Image-Pro Workspace format reader:

- Channel : ID¹⁹³⁹
- Channel : SamplesPerPixel¹⁹⁴⁰
- Image : AcquisitionDate¹⁹⁴¹
- Image : Description¹⁹⁴²
- Image : ID¹⁹⁴³
- Image : Name¹⁹⁴⁴
- Pixels : BigEndian¹⁹⁴⁵
- Pixels : DimensionOrder¹⁹⁴⁶
- Pixels : ID¹⁹⁴⁷
- Pixels : Interleaved¹⁹⁴⁸
- Pixels : SignificantBits¹⁹⁴⁹
- Pixels : SizeC¹⁹⁵⁰
- Pixels : SizeT¹⁹⁵¹
- Pixels : SizeX¹⁹⁵²

¹⁹³⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹³⁷<http://www.openmicroscopy.org/site/support/legacy/>

¹⁹³⁸<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

¹⁹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

- Pixels : SizeY¹⁹⁵³
- Pixels : SizeZ¹⁹⁵⁴
- Pixels : Type¹⁹⁵⁵
- Plane : TheC¹⁹⁵⁶
- Plane : TheT¹⁹⁵⁷
- Plane : TheZ¹⁹⁵⁸

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 version¹⁹⁵⁹ or the previous versions¹⁹⁶⁰ page to find documentation for the version you are using.

18.2.47 ImagicReader

This page lists supported metadata fields for the Bio-Formats IMAGIC format reader.

These fields are from the OME data model¹⁹⁶¹. 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 : ID¹⁹⁶²
- Channel : SamplesPerPixel¹⁹⁶³
- Image : AcquisitionDate¹⁹⁶⁴
- Image : ID¹⁹⁶⁵
- Image : Name¹⁹⁶⁶
- Pixels : BigEndian¹⁹⁶⁷
- Pixels : DimensionOrder¹⁹⁶⁸
- Pixels : ID¹⁹⁶⁹

¹⁹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁹⁵⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹⁶⁰<http://www.openmicroscopy.org/site/support/legacy/>

¹⁹⁶¹<http://www.openmicroscopy.org/site/support/ome-model/>

¹⁹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

- Pixels : Interleaved¹⁹⁷⁰
- Pixels : PhysicalSizeX¹⁹⁷¹
- Pixels : PhysicalSizeY¹⁹⁷²
- Pixels : PhysicalSizeZ¹⁹⁷³
- Pixels : SignificantBits¹⁹⁷⁴
- Pixels : SizeC¹⁹⁷⁵
- Pixels : SizeT¹⁹⁷⁶
- Pixels : SizeX¹⁹⁷⁷
- Pixels : SizeY¹⁹⁷⁸
- Pixels : SizeZ¹⁹⁷⁹
- Pixels : Type¹⁹⁸⁰
- Plane : TheC¹⁹⁸¹
- Plane : TheT¹⁹⁸²
- Plane : TheZ¹⁹⁸³

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 version¹⁹⁸⁴ or the previous versions¹⁹⁸⁵ page to find documentation for the version you are using.

18.2.48 IMODReader

This page lists supported metadata fields for the Bio-Formats IMOD format reader.

These fields are from the OME data model¹⁹⁸⁶. 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:

¹⁹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

¹⁹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

¹⁹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

¹⁹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

¹⁹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

¹⁹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

¹⁹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

¹⁹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

¹⁹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

¹⁹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

¹⁹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

¹⁹⁸⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

¹⁹⁸⁵<http://www.openmicroscopy.org/site/support/legacy/>

¹⁹⁸⁶<http://www.openmicroscopy.org/site/support/ome-model/>

- Channel : ID¹⁹⁸⁷
- Channel : SamplesPerPixel¹⁹⁸⁸
- Image : AcquisitionDate¹⁹⁸⁹
- Image : ID¹⁹⁹⁰
- Image : Name¹⁹⁹¹
- Image : ROIRef¹⁹⁹²
- Pixels : BigEndian¹⁹⁹³
- Pixels : DimensionOrder¹⁹⁹⁴
- Pixels : ID¹⁹⁹⁵
- Pixels : Interleaved¹⁹⁹⁶
- Pixels : PhysicalSizeX¹⁹⁹⁷
- Pixels : PhysicalSizeY¹⁹⁹⁸
- Pixels : PhysicalSizeZ¹⁹⁹⁹
- Pixels : SignificantBits²⁰⁰⁰
- Pixels : SizeC²⁰⁰¹
- Pixels : SizeT²⁰⁰²
- Pixels : SizeX²⁰⁰³
- Pixels : SizeY²⁰⁰⁴
- Pixels : SizeZ²⁰⁰⁵
- Pixels : Type²⁰⁰⁶
- Plane : TheC²⁰⁰⁷
- Plane : TheT²⁰⁰⁸
- Plane : TheZ²⁰⁰⁹
- Point : ID²⁰¹⁰
- Point : StrokeColor²⁰¹¹
- Point : StrokeDashArray²⁰¹²

¹⁹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

¹⁹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

¹⁹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

¹⁹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

¹⁹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

¹⁹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

¹⁹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

¹⁹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

¹⁹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

¹⁹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

¹⁹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

¹⁹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

¹⁹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²⁰⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁰⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁰⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁰⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁰⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁰⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁰⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁰⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁰⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁰⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁰¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁰¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

²⁰¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray

- Point : StrokeWidth²⁰¹³
- Point : TheZ²⁰¹⁴
- Point : X²⁰¹⁵
- Point : Y²⁰¹⁶
- Polygon : ID²⁰¹⁷
- Polygon : Points²⁰¹⁸
- Polygon : StrokeColor²⁰¹⁹
- Polygon : StrokeDashArray²⁰²⁰
- Polygon : StrokeWidth²⁰²¹
- Polygon : TheZ²⁰²²
- Polyline : ID²⁰²³
- Polyline : Points²⁰²⁴
- Polyline : StrokeColor²⁰²⁵
- Polyline : StrokeDashArray²⁰²⁶
- Polyline : StrokeWidth²⁰²⁷
- Polyline : TheZ²⁰²⁸
- ROI : ID²⁰²⁹
- ROI : Name²⁰³⁰

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 version²⁰³¹ or the previous versions²⁰³² page to find documentation for the version you are using.

18.2.49 OpenlabReader

This page lists supported metadata fields for the Bio-Formats Openlab LIFF format reader.

These fields are from the OME data model²⁰³³. 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*:

²⁰¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

²⁰¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

²⁰¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_X

²⁰¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_Y

²⁰¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁰¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

²⁰¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

²⁰²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray

²⁰²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

²⁰²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

²⁰²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁰²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polyline_Points

²⁰²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

²⁰²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeDashArray

²⁰²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

²⁰²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

²⁰²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

²⁰³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Name

²⁰³¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁰³²<http://www.openmicroscopy.org/site/support/legacy/>

²⁰³³<http://www.openmicroscopy.org/site/support/ome-model/>

- 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 : ID²⁰³⁴
- Channel : Name²⁰³⁵
- Channel : SamplesPerPixel²⁰³⁶
- Detector : ID²⁰³⁷
- Detector : Type²⁰³⁸
- DetectorSettings : Gain²⁰³⁹
- DetectorSettings : ID²⁰⁴⁰
- DetectorSettings : Offset²⁰⁴¹
- Image : AcquisitionDate²⁰⁴²
- Image : ID²⁰⁴³
- Image : InstrumentRef²⁰⁴⁴
- Image : Name²⁰⁴⁵
- Instrument : ID²⁰⁴⁶
- Pixels : BigEndian²⁰⁴⁷
- Pixels : DimensionOrder²⁰⁴⁸
- Pixels : ID²⁰⁴⁹
- Pixels : Interleaved²⁰⁵⁰
- Pixels : PhysicalSizeX²⁰⁵¹
- Pixels : PhysicalSizeY²⁰⁵²
- Pixels : SignificantBits²⁰⁵³
- Pixels : SizeC²⁰⁵⁴
- Pixels : SizeT²⁰⁵⁵
- Pixels : SizeX²⁰⁵⁶

²⁰³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁰³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁰³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁰³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²⁰³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²⁰³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

²⁰⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²⁰⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

²⁰⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁰⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁰⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁰⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁰⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁰⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁰⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁰⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁰⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁰⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁰⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁰⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁰⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁰⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁰⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

- Pixels : SizeY²⁰⁵⁷
- Pixels : SizeZ²⁰⁵⁸
- Pixels : Type²⁰⁵⁹
- Plane : PositionX²⁰⁶⁰
- Plane : PositionY²⁰⁶¹
- Plane : PositionZ²⁰⁶²
- Plane : TheC²⁰⁶³
- Plane : TheT²⁰⁶⁴
- Plane : TheZ²⁰⁶⁵

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 version²⁰⁶⁶](#) or the [previous versions²⁰⁶⁷](#) page to find documentation for the version you are using.

18.2.50 OpenlabRawReader

This page lists supported metadata fields for the Bio-Formats Openlab RAW format reader.

These fields are from the [OME data model²⁰⁶⁸](#). 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 : ID²⁰⁶⁹
- Channel : SamplesPerPixel²⁰⁷⁰
- Image : AcquisitionDate²⁰⁷¹
- Image : ID²⁰⁷²
- Image : Name²⁰⁷³

²⁰⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁰⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁰⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁰⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²⁰⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²⁰⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

²⁰⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁰⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁰⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁰⁶⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁰⁶⁷<http://www.openmicroscopy.org/site/support/legacy/>

²⁰⁶⁸<http://www.openmicroscopy.org/site/support/ome-model/>

²⁰⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁰⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁰⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁰⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁰⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

- Pixels : BigEndian²⁰⁷⁴
- Pixels : DimensionOrder²⁰⁷⁵
- Pixels : ID²⁰⁷⁶
- Pixels : Interleaved²⁰⁷⁷
- Pixels : SignificantBits²⁰⁷⁸
- Pixels : SizeC²⁰⁷⁹
- Pixels : SizeT²⁰⁸⁰
- Pixels : SizeX²⁰⁸¹
- Pixels : SizeY²⁰⁸²
- Pixels : SizeZ²⁰⁸³
- Pixels : Type²⁰⁸⁴
- Plane : TheC²⁰⁸⁵
- Plane : TheT²⁰⁸⁶
- Plane : TheZ²⁰⁸⁷

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 version²⁰⁸⁸ or the previous versions²⁰⁸⁹ page to find documentation for the version you are using.

18.2.51 ImprovionTiffReader

This page lists supported metadata fields for the Bio-Formats Improvion TIFF format reader.

These fields are from the OME data model²⁰⁹⁰. 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:

- ²⁰⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ²⁰⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ²⁰⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ²⁰⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ²⁰⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ²⁰⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ²⁰⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ²⁰⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ²⁰⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ²⁰⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ²⁰⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ²⁰⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ²⁰⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ²⁰⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ²⁰⁸⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ²⁰⁸⁹<http://www.openmicroscopy.org/site/support/legacy/>
- ²⁰⁹⁰<http://www.openmicroscopy.org/site/support/ome-model/>

- Channel : ID²⁰⁹¹
- Channel : Name²⁰⁹²
- Channel : SamplesPerPixel²⁰⁹³
- Image : AcquisitionDate²⁰⁹⁴
- Image : Description²⁰⁹⁵
- Image : ID²⁰⁹⁶
- Image : Name²⁰⁹⁷
- Pixels : BigEndian²⁰⁹⁸
- Pixels : DimensionOrder²⁰⁹⁹
- Pixels : ID²¹⁰⁰
- Pixels : Interleaved²¹⁰¹
- Pixels : PhysicalSizeX²¹⁰²
- Pixels : PhysicalSizeY²¹⁰³
- Pixels : PhysicalSizeZ²¹⁰⁴
- Pixels : SignificantBits²¹⁰⁵
- Pixels : SizeC²¹⁰⁶
- Pixels : SizeT²¹⁰⁷
- Pixels : SizeX²¹⁰⁸
- Pixels : SizeY²¹⁰⁹
- Pixels : SizeZ²¹¹⁰
- Pixels : TimeIncrement²¹¹¹
- Pixels : Type²¹¹²
- Plane : TheC²¹¹³
- Plane : TheT²¹¹⁴
- Plane : TheZ²¹¹⁵

²⁰⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁰⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁰⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁰⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁰⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁰⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁰⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁰⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁰⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²¹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²¹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²¹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²¹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²¹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²¹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²¹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²¹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²¹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²¹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²¹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²¹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

²¹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²¹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²¹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²¹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

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 version²¹¹⁶](#) or the [previous versions²¹¹⁷](#) page to find documentation for the version you are using.

18.2.52 OBFReader

This page lists supported metadata fields for the Bio-Formats OBF format reader.

These fields are from the [OME data model²¹¹⁸](#). 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 OBF format reader:

- Channel : ID²¹¹⁹
- Channel : SamplesPerPixel²¹²⁰
- Image : AcquisitionDate²¹²¹
- Image : ID²¹²²
- Image : Name²¹²³
- Pixels : BigEndian²¹²⁴
- Pixels : DimensionOrder²¹²⁵
- Pixels : ID²¹²⁶
- Pixels : Interleaved²¹²⁷
- Pixels : SignificantBits²¹²⁸
- Pixels : SizeC²¹²⁹
- Pixels : SizeT²¹³⁰
- Pixels : SizeX²¹³¹
- Pixels : SizeY²¹³²

²¹¹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²¹¹⁷<http://www.openmicroscopy.org/site/support/legacy/>

²¹¹⁸<http://www.openmicroscopy.org/site/support/ome-model/>

²¹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²¹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²¹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²¹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²¹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²¹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²¹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²¹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²¹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²¹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²¹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²¹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²¹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²¹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ²¹³³
- Pixels : Type²¹³⁴
- Plane : TheC²¹³⁵
- Plane : TheT²¹³⁶
- Plane : TheZ²¹³⁷

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 version²¹³⁸](#) or the [previous versions²¹³⁹](#) page to find documentation for the version you are using.

18.2.53 InCellReader

This page lists supported metadata fields for the Bio-Formats InCell 1000/2000 format reader.

These fields are from the [OME data model²¹⁴⁰](#). 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 : EmissionWavelength²¹⁴¹
- Channel : ExcitationWavelength²¹⁴²
- Channel : ID²¹⁴³
- Channel : Name²¹⁴⁴
- Channel : SamplesPerPixel²¹⁴⁵
- Detector : ID²¹⁴⁶
- Detector : Model²¹⁴⁷
- Detector : Type²¹⁴⁸
- DetectorSettings : Binning²¹⁴⁹

²¹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²¹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²¹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²¹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²¹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²¹³⁸<http://www.openmicroscopy.org/site/support/bio-formats/5.0/>

²¹³⁹<http://www.openmicroscopy.org/site/support/legacy/>

²¹⁴⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²¹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

²¹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

²¹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²¹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²¹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²¹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²¹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²¹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²¹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

- DetectorSettings : Gain²¹⁵⁰
- DetectorSettings : ID²¹⁵¹
- Experiment : ID²¹⁵²
- Experiment : Type²¹⁵³
- Image : AcquisitionDate²¹⁵⁴
- Image : Description²¹⁵⁵
- Image : ExperimentRef²¹⁵⁶
- Image : ID²¹⁵⁷
- Image : InstrumentRef²¹⁵⁸
- Image : Name²¹⁵⁹
- ImagingEnvironment : Temperature²¹⁶⁰
- Instrument : ID²¹⁶¹
- Objective : Correction²¹⁶²
- Objective : ID²¹⁶³
- Objective : Immersion²¹⁶⁴
- Objective : LensNA²¹⁶⁵
- Objective : Manufacturer²¹⁶⁶
- Objective : NominalMagnification²¹⁶⁷
- ObjectiveSettings : ID²¹⁶⁸
- ObjectiveSettings : RefractiveIndex²¹⁶⁹
- Pixels : BigEndian²¹⁷⁰
- Pixels : DimensionOrder²¹⁷¹
- Pixels : ID²¹⁷²
- Pixels : Interleaved²¹⁷³
- Pixels : PhysicalSizeX²¹⁷⁴
- Pixels : PhysicalSizeY²¹⁷⁵

²¹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

²¹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²¹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID

²¹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type

²¹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²¹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²¹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimentRef_ID

²¹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²¹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²¹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²¹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

²¹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²¹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

²¹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²¹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

²¹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²¹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

²¹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

²¹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

²¹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

²¹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²¹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²¹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²¹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²¹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²¹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

- Pixels : SignificantBits²¹⁷⁶
- Pixels : SizeC²¹⁷⁷
- Pixels : SizeT²¹⁷⁸
- Pixels : SizeX²¹⁷⁹
- Pixels : SizeY²¹⁸⁰
- Pixels : SizeZ²¹⁸¹
- Pixels : Type²¹⁸²
- Plane : DeltaT²¹⁸³
- Plane : ExposureTime²¹⁸⁴
- Plane : PositionX²¹⁸⁵
- Plane : PositionY²¹⁸⁶
- Plane : PositionZ²¹⁸⁷
- Plane : TheC²¹⁸⁸
- Plane : TheT²¹⁸⁹
- Plane : TheZ²¹⁹⁰
- Plate : ColumnNamingConvention²¹⁹¹
- Plate : ID²¹⁹²
- Plate : Name²¹⁹³
- Plate : RowNamingConvention²¹⁹⁴
- Plate : WellOriginX²¹⁹⁵
- Plate : WellOriginY²¹⁹⁶
- PlateAcquisition : ID²¹⁹⁷
- PlateAcquisition : MaximumFieldCount²¹⁹⁸
- PlateAcquisition : WellSampleRef²¹⁹⁹
- Well : Column²²⁰⁰
- Well : ID²²⁰¹

²¹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²¹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²¹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²¹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²¹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²¹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²¹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²¹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²¹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²¹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²¹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²¹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

²¹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²¹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²¹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²¹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

²¹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

²¹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

²¹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

²¹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_WellOriginX

²¹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_WellOriginY

²¹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

²¹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

²¹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

²²⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

²²⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

- Well : Row²²⁰²
- WellSample : ID²²⁰³
- WellSample : ImageRef²²⁰⁴
- WellSample : Index²²⁰⁵
- WellSample : PositionX²²⁰⁶
- WellSample : PositionY²²⁰⁷

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 version²²⁰⁸ or the previous versions²²⁰⁹ page to find documentation for the version you are using.

18.2.54 InCell3000Reader

This page lists supported metadata fields for the Bio-Formats InCell 3000 format reader.

These fields are from the OME data model²²¹⁰. 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 : ID²²¹¹
- Channel : SamplesPerPixel²²¹²
- Image : AcquisitionDate²²¹³
- Image : ID²²¹⁴
- Image : Name²²¹⁵
- Pixels : BigEndian²²¹⁶
- Pixels : DimensionOrder²²¹⁷
- Pixels : ID²²¹⁸

²²⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

²²⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

²²⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

²²⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

²²⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

²²⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

²²⁰⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²²⁰⁹<http://www.openmicroscopy.org/site/support/legacy/>

²²¹⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²²¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²²¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²²¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²²¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²²¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²²¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²²¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²²¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

- Pixels : Interleaved²²¹⁹
- Pixels : SignificantBits²²²⁰
- Pixels : SizeC²²²¹
- Pixels : SizeT²²²²
- Pixels : SizeX²²²³
- Pixels : SizeY²²²⁴
- Pixels : SizeZ²²²⁵
- Pixels : Type²²²⁶
- Plane : TheC²²²⁷
- Plane : TheT²²²⁸
- Plane : TheZ²²²⁹

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 version²²³⁰](#) or the [previous versions²²³¹](#) page to find documentation for the version you are using.

18.2.55 INRReader

This page lists supported metadata fields for the Bio-Formats INR format reader.

These fields are from the [OME data model²²³²](#). 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 : ID²²³³
- Channel : SamplesPerPixel²²³⁴
- Image : AcquisitionDate²²³⁵

²²¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²²²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²²²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²²²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²²²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²²²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²²²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²²²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²²²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²²²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²²²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²²³⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²²³¹<http://www.openmicroscopy.org/site/support/legacy/>

²²³²<http://www.openmicroscopy.org/site/support/ome-model/>

²²³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²²³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²²³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID²²³⁶
- Image : Name²²³⁷
- Pixels : BigEndian²²³⁸
- Pixels : DimensionOrder²²³⁹
- Pixels : ID²²⁴⁰
- Pixels : Interleaved²²⁴¹
- Pixels : PhysicalSizeX²²⁴²
- Pixels : PhysicalSizeY²²⁴³
- Pixels : PhysicalSizeZ²²⁴⁴
- Pixels : SignificantBits²²⁴⁵
- Pixels : SizeC²²⁴⁶
- Pixels : SizeT²²⁴⁷
- Pixels : SizeX²²⁴⁸
- Pixels : SizeY²²⁴⁹
- Pixels : SizeZ²²⁵⁰
- Pixels : Type²²⁵¹
- Plane : TheC²²⁵²
- Plane : TheT²²⁵³
- Plane : TheZ²²⁵⁴

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 version²²⁵⁵ or the previous versions²²⁵⁶ page to find documentation for the version you are using.

18.2.56 InveonReader

This page lists supported metadata fields for the Bio-Formats Inveon format reader.

- ²²³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ²²³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ²²³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ²²³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ²²⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ²²⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ²²⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ²²⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ²²⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ
- ²²⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ²²⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ²²⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ²²⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ²²⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ²²⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ²²⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ²²⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ²²⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ²²⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ²²⁵⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ²²⁵⁶<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)²²⁵⁷. 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 : ID²²⁵⁸
- Channel : SamplesPerPixel²²⁵⁹
- Experimenter : ID²²⁶⁰
- Experimenter : Institution²²⁶¹
- Experimenter : UserName²²⁶²
- Image : AcquisitionDate²²⁶³
- Image : Description²²⁶⁴
- Image : ExperimenterRef²²⁶⁵
- Image : ID²²⁶⁶
- Image : InstrumentRef²²⁶⁷
- Image : Name²²⁶⁸
- Instrument : ID²²⁶⁹
- Microscope : Model²²⁷⁰
- Pixels : BigEndian²²⁷¹
- Pixels : DimensionOrder²²⁷²
- Pixels : ID²²⁷³
- Pixels : Interleaved²²⁷⁴
- Pixels : PhysicalSizeX²²⁷⁵
- Pixels : PhysicalSizeY²²⁷⁶
- Pixels : PhysicalSizeZ²²⁷⁷

²²⁵⁷<http://www.openmicroscopy.org/site/support/ome-model/>

²²⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²²⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²²⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

²²⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_Institution

²²⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_UserName

²²⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²²⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²²⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID

²²⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²²⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²²⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²²⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²²⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²²⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²²⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²²⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²²⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²²⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²²⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²²⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

- Pixels : SignificantBits²²⁷⁸
- Pixels : SizeC²²⁷⁹
- Pixels : SizeT²²⁸⁰
- Pixels : SizeX²²⁸¹
- Pixels : SizeY²²⁸²
- Pixels : SizeZ²²⁸³
- Pixels : Type²²⁸⁴
- Plane : TheC²²⁸⁵
- Plane : TheT²²⁸⁶
- Plane : TheZ²²⁸⁷

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 version²²⁸⁸](#) or the [previous versions²²⁸⁹](#) page to find documentation for the version you are using.

18.2.57 IvisionReader

This page lists supported metadata fields for the Bio-Formats IVison format reader.

These fields are from the [OME data model²²⁹⁰](#). 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 IVison format reader:

- Channel : ID²²⁹¹
- Channel : SamplesPerPixel²²⁹²
- Detector : ID²²⁹³
- Detector : Type²²⁹⁴

²²⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²²⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²²⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²²⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²²⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²²⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²²⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²²⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²²⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²²⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²²⁸⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²²⁸⁹<http://www.openmicroscopy.org/site/support/legacy/>

²²⁹⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²²⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²²⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²²⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²²⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

- DetectorSettings : Binning²²⁹⁵
- DetectorSettings : Gain²²⁹⁶
- DetectorSettings : ID²²⁹⁷
- Image : AcquisitionDate²²⁹⁸
- Image : ID²²⁹⁹
- Image : InstrumentRef²³⁰⁰
- Image : Name²³⁰¹
- Instrument : ID²³⁰²
- Objective : Correction²³⁰³
- Objective : ID²³⁰⁴
- Objective : Immersion²³⁰⁵
- Objective : LensNA²³⁰⁶
- Objective : NominalMagnification²³⁰⁷
- ObjectiveSettings : ID²³⁰⁸
- ObjectiveSettings : RefractiveIndex²³⁰⁹
- Pixels : BigEndian²³¹⁰
- Pixels : DimensionOrder²³¹¹
- Pixels : ID²³¹²
- Pixels : Interleaved²³¹³
- Pixels : SignificantBits²³¹⁴
- Pixels : SizeC²³¹⁵
- Pixels : SizeT²³¹⁶
- Pixels : SizeX²³¹⁷
- Pixels : SizeY²³¹⁸
- Pixels : SizeZ²³¹⁹
- Pixels : TimeIncrement²³²⁰

²²⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

²²⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

²²⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²²⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²²⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²³⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²³⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²³⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²³⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

²³⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²³⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

²³⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²³⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

²³⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

²³⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

²³¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²³¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²³¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²³¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²³¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²³¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²³¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²³¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²³¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²³¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²³²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

- Pixels : Type²³²¹
- Plane : TheC²³²²
- Plane : TheT²³²³
- Plane : TheZ²³²⁴

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 version²³²⁵ or the previous versions²³²⁶ page to find documentation for the version you are using.

18.2.58 IPLabReader

This page lists supported metadata fields for the Bio-Formats IPLab format reader.

These fields are from the OME data model²³²⁷. 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 : ID²³²⁸
- Channel : SamplesPerPixel²³²⁹
- Image : AcquisitionDate²³³⁰
- Image : Description²³³¹
- Image : ID²³³²
- Image : Name²³³³
- Image : ROIRef²³³⁴
- Pixels : BigEndian²³³⁵
- Pixels : DimensionOrder²³³⁶
- Pixels : ID²³³⁷

²³²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²³²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²³²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²³²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²³²⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²³²⁶<http://www.openmicroscopy.org/site/support/legacy/>

²³²⁷<http://www.openmicroscopy.org/site/support/ome-model/>

²³²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²³²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²³³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²³³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²³³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²³³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²³³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

²³³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²³³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²³³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

- Pixels : Interleaved²³³⁸
- Pixels : PhysicalSizeX²³³⁹
- Pixels : PhysicalSizeY²³⁴⁰
- Pixels : SignificantBits²³⁴¹
- Pixels : SizeC²³⁴²
- Pixels : SizeT²³⁴³
- Pixels : SizeX²³⁴⁴
- Pixels : SizeY²³⁴⁵
- Pixels : SizeZ²³⁴⁶
- Pixels : TimeIncrement²³⁴⁷
- Pixels : Type²³⁴⁸
- Plane : DeltaT²³⁴⁹
- Plane : TheC²³⁵⁰
- Plane : TheT²³⁵¹
- Plane : TheZ²³⁵²
- ROI : ID²³⁵³
- Rectangle : Height²³⁵⁴
- Rectangle : ID²³⁵⁵
- Rectangle : Width²³⁵⁶
- Rectangle : X²³⁵⁷
- Rectangle : Y²³⁵⁸

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 version²³⁵⁹ or the previous versions²³⁶⁰ page to find documentation for the version you are using.

²³³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²³³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²³⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²³⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²³⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²³⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²³⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²³⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²³⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²³⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

²³⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²³⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²³⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²³⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²³⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²³⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

²³⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

²³⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²³⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

²³⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

²³⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

²³⁵⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²³⁶⁰<http://www.openmicroscopy.org/site/support/legacy/>

18.2.59 JEOLReader

This page lists supported metadata fields for the Bio-Formats JEOL format reader.

These fields are from the [OME data model](#)²³⁶¹. 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 : ID²³⁶²
- Channel : SamplesPerPixel²³⁶³
- Image : AcquisitionDate²³⁶⁴
- Image : ID²³⁶⁵
- Image : Name²³⁶⁶
- Pixels : BigEndian²³⁶⁷
- Pixels : DimensionOrder²³⁶⁸
- Pixels : ID²³⁶⁹
- Pixels : Interleaved²³⁷⁰
- Pixels : SignificantBits²³⁷¹
- Pixels : SizeC²³⁷²
- Pixels : SizeT²³⁷³
- Pixels : SizeX²³⁷⁴
- Pixels : SizeY²³⁷⁵
- Pixels : SizeZ²³⁷⁶
- Pixels : Type²³⁷⁷
- Plane : TheC²³⁷⁸
- Plane : TheT²³⁷⁹

²³⁶¹<http://www.openmicroscopy.org/site/support/ome-model/>

²³⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²³⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²³⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²³⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²³⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²³⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²³⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²³⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²³⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²³⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²³⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²³⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²³⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²³⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²³⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²³⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²³⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²³⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ²³⁸⁰

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 version²³⁸¹](#) or the [previous versions²³⁸²](#) page to find documentation for the version you are using.

18.2.60 JPEG2000Reader

This page lists supported metadata fields for the Bio-Formats JPEG-2000 format reader.

These fields are from the [OME data model²³⁸³](#). 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-2000 format reader:

- Channel : ID²³⁸⁴
- Channel : SamplesPerPixel²³⁸⁵
- Image : AcquisitionDate²³⁸⁶
- Image : ID²³⁸⁷
- Image : Name²³⁸⁸
- Pixels : BigEndian²³⁸⁹
- Pixels : DimensionOrder²³⁹⁰
- Pixels : ID²³⁹¹
- Pixels : Interleaved²³⁹²
- Pixels : SignificantBits²³⁹³
- Pixels : SizeC²³⁹⁴
- Pixels : SizeT²³⁹⁵
- Pixels : SizeX²³⁹⁶

²³⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²³⁸¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²³⁸²<http://www.openmicroscopy.org/site/support/legacy/>

²³⁸³<http://www.openmicroscopy.org/site/support/ome-model/>

²³⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²³⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²³⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²³⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²³⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²³⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²³⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²³⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²³⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²³⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²³⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²³⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²³⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

- Pixels : SizeY²³⁹⁷
- Pixels : SizeZ²³⁹⁸
- Pixels : Type²³⁹⁹
- Plane : TheC²⁴⁰⁰
- Plane : TheT²⁴⁰¹
- Plane : TheZ²⁴⁰²

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 version²⁴⁰³ or the previous versions²⁴⁰⁴ page to find documentation for the version you are using.

18.2.61 JPEGReader

This page lists supported metadata fields for the Bio-Formats JPEG format reader.

These fields are from the OME data model²⁴⁰⁵. 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 : ID²⁴⁰⁶
- Channel : SamplesPerPixel²⁴⁰⁷
- Image : AcquisitionDate²⁴⁰⁸
- Image : ID²⁴⁰⁹
- Image : Name²⁴¹⁰
- Pixels : BigEndian²⁴¹¹
- Pixels : DimensionOrder²⁴¹²
- Pixels : ID²⁴¹³

²³⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²³⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²³⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁴⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁴⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁴⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁴⁰³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴⁰⁴<http://www.openmicroscopy.org/site/support/legacy/>

²⁴⁰⁵<http://www.openmicroscopy.org/site/support/ome-model/>

²⁴⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁴⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁴⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁴⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁴¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁴¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁴¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁴¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

- Pixels : Interleaved²⁴¹⁴
- Pixels : SignificantBits²⁴¹⁵
- Pixels : SizeC²⁴¹⁶
- Pixels : SizeT²⁴¹⁷
- Pixels : SizeX²⁴¹⁸
- Pixels : SizeY²⁴¹⁹
- Pixels : SizeZ²⁴²⁰
- Pixels : Type²⁴²¹
- Plane : TheC²⁴²²
- Plane : TheT²⁴²³
- Plane : TheZ²⁴²⁴

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 version²⁴²⁵](#) or the [previous versions²⁴²⁶](#) page to find documentation for the version you are using.

18.2.62 JPKReader

This page lists supported metadata fields for the Bio-Formats JPK Instruments format reader.

These fields are from the [OME data model²⁴²⁷](#). 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 : ID²⁴²⁸
- Channel : SamplesPerPixel²⁴²⁹
- Image : AcquisitionDate²⁴³⁰

²⁴¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁴¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁴¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁴¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁴¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁴¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁴²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁴²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁴²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁴²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁴²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁴²⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴²⁶<http://www.openmicroscopy.org/site/support/legacy/>

²⁴²⁷<http://www.openmicroscopy.org/site/support/ome-model/>

²⁴²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁴²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁴³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID²⁴³¹
- Image : Name²⁴³²
- Pixels : BigEndian²⁴³³
- Pixels : DimensionOrder²⁴³⁴
- Pixels : ID²⁴³⁵
- Pixels : Interleaved²⁴³⁶
- Pixels : SignificantBits²⁴³⁷
- Pixels : SizeC²⁴³⁸
- Pixels : SizeT²⁴³⁹
- Pixels : SizeX²⁴⁴⁰
- Pixels : SizeY²⁴⁴¹
- Pixels : SizeZ²⁴⁴²
- Pixels : Type²⁴⁴³
- Plane : TheC²⁴⁴⁴
- Plane : TheT²⁴⁴⁵
- Plane : TheZ²⁴⁴⁶

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 version²⁴⁴⁷ or the previous versions²⁴⁴⁸ page to find documentation for the version you are using.

18.2.63 JPXReader

This page lists supported metadata fields for the Bio-Formats JPX format reader.

These fields are from the OME data model²⁴⁴⁹. 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%).

²⁴³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁴³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁴³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁴³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁴³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁴³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁴³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁴³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁴³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁴⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁴⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁴⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁴⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁴⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁴⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁴⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁴⁴⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴⁴⁸<http://www.openmicroscopy.org/site/support/legacy/>

²⁴⁴⁹<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats JPX format reader:

- Channel : ID²⁴⁵⁰
- Channel : SamplesPerPixel²⁴⁵¹
- Image : AcquisitionDate²⁴⁵²
- Image : ID²⁴⁵³
- Image : Name²⁴⁵⁴
- Pixels : BigEndian²⁴⁵⁵
- Pixels : DimensionOrder²⁴⁵⁶
- Pixels : ID²⁴⁵⁷
- Pixels : Interleaved²⁴⁵⁸
- Pixels : SignificantBits²⁴⁵⁹
- Pixels : SizeC²⁴⁶⁰
- Pixels : SizeT²⁴⁶¹
- Pixels : SizeX²⁴⁶²
- Pixels : SizeY²⁴⁶³
- Pixels : SizeZ²⁴⁶⁴
- Pixels : Type²⁴⁶⁵
- Plane : TheC²⁴⁶⁶
- Plane : TheT²⁴⁶⁷
- Plane : TheZ²⁴⁶⁸

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 version²⁴⁶⁹ or the previous versions²⁴⁷⁰ page to find documentation for the version you are using.

²⁴⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁴⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁴⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁴⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁴⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁴⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁴⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁴⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁴⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁴⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁴⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁴⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁴⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁴⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁴⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁴⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁴⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁴⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁴⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁴⁶⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴⁷⁰<http://www.openmicroscopy.org/site/support/legacy/>

18.2.64 KhorosReader

This page lists supported metadata fields for the Bio-Formats Khoros XV format reader.

These fields are from the [OME data model](#)²⁴⁷¹. 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 : ID²⁴⁷²
- Channel : SamplesPerPixel²⁴⁷³
- Image : AcquisitionDate²⁴⁷⁴
- Image : ID²⁴⁷⁵
- Image : Name²⁴⁷⁶
- Pixels : BigEndian²⁴⁷⁷
- Pixels : DimensionOrder²⁴⁷⁸
- Pixels : ID²⁴⁷⁹
- Pixels : Interleaved²⁴⁸⁰
- Pixels : SignificantBits²⁴⁸¹
- Pixels : SizeC²⁴⁸²
- Pixels : SizeT²⁴⁸³
- Pixels : SizeX²⁴⁸⁴
- Pixels : SizeY²⁴⁸⁵
- Pixels : SizeZ²⁴⁸⁶
- Pixels : Type²⁴⁸⁷
- Plane : TheC²⁴⁸⁸
- Plane : TheT²⁴⁸⁹

²⁴⁷¹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁴⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁴⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁴⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁴⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁴⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁴⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁴⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁴⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁴⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁴⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁴⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁴⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁴⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁴⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁴⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁴⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁴⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁴⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ²⁴⁹⁰

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 version²⁴⁹¹](#) or the [previous versions²⁴⁹²](#) page to find documentation for the version you are using.

18.2.65 KodakReader

This page lists supported metadata fields for the Bio-Formats Kodak Molecular Imaging format reader.

These fields are from the [OME data model²⁴⁹³](#). 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 Kodak Molecular Imaging format reader:

- Channel : ID²⁴⁹⁴
- Channel : SamplesPerPixel²⁴⁹⁵
- Image : AcquisitionDate²⁴⁹⁶
- Image : ID²⁴⁹⁷
- Image : InstrumentRef²⁴⁹⁸
- Image : Name²⁴⁹⁹
- ImagingEnvironment : Temperature²⁵⁰⁰
- Instrument : ID²⁵⁰¹
- Microscope : Model²⁵⁰²
- Pixels : BigEndian²⁵⁰³
- Pixels : DimensionOrder²⁵⁰⁴
- Pixels : ID²⁵⁰⁵
- Pixels : Interleaved²⁵⁰⁶

²⁴⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁴⁹¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁴⁹²<http://www.openmicroscopy.org/site/support/legacy/>

²⁴⁹³<http://www.openmicroscopy.org/site/support/ome-model/>

²⁴⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁴⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁴⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁴⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁴⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁴⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁵⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

²⁵⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁵⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁵⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁵⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁵⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁵⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

- Pixels : PhysicalSizeX²⁵⁰⁷
- Pixels : PhysicalSizeY²⁵⁰⁸
- Pixels : SignificantBits²⁵⁰⁹
- Pixels : SizeC²⁵¹⁰
- Pixels : SizeT²⁵¹¹
- Pixels : SizeX²⁵¹²
- Pixels : SizeY²⁵¹³
- Pixels : SizeZ²⁵¹⁴
- Pixels : Type²⁵¹⁵
- Plane : ExposureTime²⁵¹⁶
- Plane : TheC²⁵¹⁷
- Plane : TheT²⁵¹⁸
- Plane : TheZ²⁵¹⁹

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 version²⁵²⁰](#) or the [previous versions²⁵²¹](#) page to find documentation for the version you are using.

18.2.66 LiFlimReader

This page lists supported metadata fields for the Bio-Formats LI-FLIM format reader.

These fields are from the [OME data model²⁵²²](#). 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 : ID²⁵²³

²⁵⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁵⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁵⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁵¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁵¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁵¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁵¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁵¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁵¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁵¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁵¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁵¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁵¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁵²⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁵²¹<http://www.openmicroscopy.org/site/support/legacy/>

²⁵²²<http://www.openmicroscopy.org/site/support/ome-model/>

²⁵²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

- Channel : SamplesPerPixel²⁵²⁴
- Image : AcquisitionDate²⁵²⁵
- Image : ID²⁵²⁶
- Image : Name²⁵²⁷
- Image : ROIRef²⁵²⁸
- Pixels : BigEndian²⁵²⁹
- Pixels : DimensionOrder²⁵³⁰
- Pixels : ID²⁵³¹
- Pixels : Interleaved²⁵³²
- Pixels : SignificantBits²⁵³³
- Pixels : SizeC²⁵³⁴
- Pixels : SizeT²⁵³⁵
- Pixels : SizeX²⁵³⁶
- Pixels : SizeY²⁵³⁷
- Pixels : SizeZ²⁵³⁸
- Pixels : Type²⁵³⁹
- Plane : DeltaT²⁵⁴⁰
- Plane : ExposureTime²⁵⁴¹
- Plane : TheC²⁵⁴²
- Plane : TheT²⁵⁴³
- Plane : TheZ²⁵⁴⁴
- Polygon : ID²⁵⁴⁵
- Polygon : Points²⁵⁴⁶
- ROI : ID²⁵⁴⁷

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 version²⁵⁴⁸ or the previous

²⁵²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁵²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁵²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁵²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁵²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

²⁵²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁵³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁵³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁵³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁵³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁵³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁵³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁵³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁵³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁵³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁵³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁵⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²⁵⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁵⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁵⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁵⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁵⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁵⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

²⁵⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

[versions²⁵⁴⁹](#) page to find documentation for the version you are using.

18.2.67 InspectorReader

This page lists supported metadata fields for the Bio-Formats Lavisoin Inspector format reader.

These fields are from the [OME data model²⁵⁵⁰](#). 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 : ID²⁵⁵¹
- Channel : SamplesPerPixel²⁵⁵²
- Image : AcquisitionDate²⁵⁵³
- Image : ID²⁵⁵⁴
- Image : Name²⁵⁵⁵
- Pixels : BigEndian²⁵⁵⁶
- Pixels : DimensionOrder²⁵⁵⁷
- Pixels : ID²⁵⁵⁸
- Pixels : Interleaved²⁵⁵⁹
- Pixels : SignificantBits²⁵⁶⁰
- Pixels : SizeC²⁵⁶¹
- Pixels : SizeT²⁵⁶²
- Pixels : SizeX²⁵⁶³
- Pixels : SizeY²⁵⁶⁴
- Pixels : SizeZ²⁵⁶⁵
- Pixels : Type²⁵⁶⁶

²⁵⁴⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁵⁴⁹<http://www.openmicroscopy.org/site/support/legacy/>

²⁵⁵⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²⁵⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁵⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁵⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁵⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁵⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁵⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁵⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁵⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁵⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁵⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁵⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁵⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁵⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁵⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁵⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁵⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC²⁵⁶⁷
- Plane : TheT²⁵⁶⁸
- Plane : TheZ²⁵⁶⁹

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 version²⁵⁷⁰](#) or the [previous versions²⁵⁷¹](#) page to find documentation for the version you are using.

18.2.68 LeicaReader

This page lists supported metadata fields for the Bio-Formats Leica format reader.

These fields are from the [OME data model²⁵⁷²](#). 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 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 : Color²⁵⁷³
- Channel : EmissionWavelength²⁵⁷⁴
- Channel : ExcitationWavelength²⁵⁷⁵
- Channel : ID²⁵⁷⁶
- Channel : Name²⁵⁷⁷
- Channel : PinholeSize²⁵⁷⁸
- Channel : SamplesPerPixel²⁵⁷⁹
- Detector : ID²⁵⁸⁰
- Detector : Offset²⁵⁸¹
- Detector : Type²⁵⁸²
- Detector : Voltage²⁵⁸³

²⁵⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁵⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁵⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁵⁷⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁵⁷¹<http://www.openmicroscopy.org/site/support/legacy/>

²⁵⁷²<http://www.openmicroscopy.org/site/support/ome-model/>

²⁵⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

²⁵⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

²⁵⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

²⁵⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁵⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁵⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

²⁵⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁵⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²⁵⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

²⁵⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²⁵⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Voltage

- DetectorSettings : ID²⁵⁸⁴
- Filter : ID²⁵⁸⁵
- Filter : Model²⁵⁸⁶
- Image : AcquisitionDate²⁵⁸⁷
- Image : Description²⁵⁸⁸
- Image : ID²⁵⁸⁹
- Image : InstrumentRef²⁵⁹⁰
- Image : Name²⁵⁹¹
- Instrument : ID²⁵⁹²
- LightPath : EmissionFilterRef²⁵⁹³
- Objective : Correction²⁵⁹⁴
- Objective : ID²⁵⁹⁵
- Objective : Immersion²⁵⁹⁶
- Objective : LensNA²⁵⁹⁷
- Objective : Model²⁵⁹⁸
- Objective : NominalMagnification²⁵⁹⁹
- Objective : SerialNumber²⁶⁰⁰
- ObjectiveSettings : ID²⁶⁰¹
- ObjectiveSettings : RefractiveIndex²⁶⁰²
- Pixels : BigEndian²⁶⁰³
- Pixels : DimensionOrder²⁶⁰⁴
- Pixels : ID²⁶⁰⁵
- Pixels : Interleaved²⁶⁰⁶
- Pixels : PhysicalSizeX²⁶⁰⁷
- Pixels : PhysicalSizeY²⁶⁰⁸
- Pixels : PhysicalSizeZ²⁶⁰⁹

²⁵⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²⁵⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

²⁵⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁵⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁵⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁵⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁵⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁵⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁵⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁵⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

²⁵⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

²⁵⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²⁵⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

²⁵⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²⁵⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁵⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

²⁶⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

²⁶⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

²⁶⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

²⁶⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁶⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁶⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁶⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁶⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁶⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁶⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

- Pixels : SignificantBits²⁶¹⁰
- Pixels : SizeC²⁶¹¹
- Pixels : SizeT²⁶¹²
- Pixels : SizeX²⁶¹³
- Pixels : SizeY²⁶¹⁴
- Pixels : SizeZ²⁶¹⁵
- Pixels : TimeIncrement²⁶¹⁶
- Pixels : Type²⁶¹⁷
- Plane : DeltaT²⁶¹⁸
- Plane : ExposureTime²⁶¹⁹
- Plane : PositionX²⁶²⁰
- Plane : PositionY²⁶²¹
- Plane : TheC²⁶²²
- Plane : TheT²⁶²³
- Plane : TheZ²⁶²⁴
- StageLabel : Name²⁶²⁵
- StageLabel : Z²⁶²⁶
- TransmittanceRange : CutIn²⁶²⁷
- TransmittanceRange : CutOut²⁶²⁸

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 version²⁶²⁹ or the previous versions²⁶³⁰ page to find documentation for the version you are using.

18.2.69 LIFReader

This page lists supported metadata fields for the Bio-Formats Leica Image File Format format reader.

²⁶¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁶¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁶¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁶¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁶¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁶¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁶¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

²⁶¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁶¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²⁶¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁶²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²⁶²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²⁶²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁶²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁶²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁶²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Name

²⁶²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Z

²⁶²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn

²⁶²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut

²⁶²⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁶³⁰<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)²⁶³¹. 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 : Color²⁶³²
- Channel : ExcitationWavelength²⁶³³
- Channel : ID²⁶³⁴
- Channel : LightSourceSettingsAttenuation²⁶³⁵
- Channel : LightSourceSettingsID²⁶³⁶
- Channel : Name²⁶³⁷
- Channel : PinholeSize²⁶³⁸
- Channel : SamplesPerPixel²⁶³⁹
- Detector : ID²⁶⁴⁰
- Detector : Model²⁶⁴¹
- Detector : Offset²⁶⁴²
- Detector : Type²⁶⁴³
- Detector : Zoom²⁶⁴⁴
- DetectorSettings : Gain²⁶⁴⁵
- DetectorSettings : ID²⁶⁴⁶
- DetectorSettings : Offset²⁶⁴⁷
- Filter : ID²⁶⁴⁸
- Filter : Model²⁶⁴⁹
- Image : AcquisitionDate²⁶⁵⁰
- Image : Description²⁶⁵¹

²⁶³¹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁶³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

²⁶³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

²⁶³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁶³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_Attenuation

²⁶³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID

²⁶³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁶³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

²⁶³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁶⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²⁶⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁶⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

²⁶⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²⁶⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Zoom

²⁶⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

²⁶⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²⁶⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

²⁶⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

²⁶⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁶⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁶⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

- Image : ID²⁶⁵²
- Image : InstrumentRef²⁶⁵³
- Image : Name²⁶⁵⁴
- Image : ROIRef²⁶⁵⁵
- Instrument : ID²⁶⁵⁶
- Label : FontSize²⁶⁵⁷
- Label : ID²⁶⁵⁸
- Label : StrokeWidth²⁶⁵⁹
- Label : Text²⁶⁶⁰
- Label : X²⁶⁶¹
- Label : Y²⁶⁶²
- Laser : ID²⁶⁶³
- Laser : LaserMedium²⁶⁶⁴
- Laser : Type²⁶⁶⁵
- Laser : Wavelength²⁶⁶⁶
- LightPath : EmissionFilterRef²⁶⁶⁷
- Line : ID²⁶⁶⁸
- Line : X1²⁶⁶⁹
- Line : X2²⁶⁷⁰
- Line : Y1²⁶⁷¹
- Line : Y2²⁶⁷²
- Microscope : Model²⁶⁷³
- Microscope : Type²⁶⁷⁴
- Objective : Correction²⁶⁷⁵
- Objective : ID²⁶⁷⁶
- Objective : Immersion²⁶⁷⁷

²⁶⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁶⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁶⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁶⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

²⁶⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁶⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

²⁶⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁶⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

²⁶⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

²⁶⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_X

²⁶⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_Y

²⁶⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

²⁶⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

²⁶⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

²⁶⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

²⁶⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

²⁶⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁶⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X1

²⁶⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X2

²⁶⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y1

²⁶⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y2

²⁶⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁶⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Microscope_Type

²⁶⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

²⁶⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²⁶⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

- Objective : LensNA²⁶⁷⁸
- Objective : Model²⁶⁷⁹
- Objective : NominalMagnification²⁶⁸⁰
- Objective : SerialNumber²⁶⁸¹
- ObjectiveSettings : ID²⁶⁸²
- ObjectiveSettings : RefractiveIndex²⁶⁸³
- Pixels : BigEndian²⁶⁸⁴
- Pixels : DimensionOrder²⁶⁸⁵
- Pixels : ID²⁶⁸⁶
- Pixels : Interleaved²⁶⁸⁷
- Pixels : PhysicalSizeX²⁶⁸⁸
- Pixels : PhysicalSizeY²⁶⁸⁹
- Pixels : PhysicalSizeZ²⁶⁹⁰
- Pixels : SignificantBits²⁶⁹¹
- Pixels : SizeC²⁶⁹²
- Pixels : SizeT²⁶⁹³
- Pixels : SizeX²⁶⁹⁴
- Pixels : SizeY²⁶⁹⁵
- Pixels : SizeZ²⁶⁹⁶
- Pixels : TimeIncrement²⁶⁹⁷
- Pixels : Type²⁶⁹⁸
- Plane : DeltaT²⁶⁹⁹
- Plane : ExposureTime²⁷⁰⁰
- Plane : PositionX²⁷⁰¹
- Plane : PositionY²⁷⁰²
- Plane : PositionZ²⁷⁰³

²⁶⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²⁶⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁶⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

²⁶⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

²⁶⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

²⁶⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

²⁶⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁶⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁶⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁶⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁶⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁶⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁶⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²⁶⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁶⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁶⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁶⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁶⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁶⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁶⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

²⁶⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁶⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²⁷⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁷⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²⁷⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²⁷⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

- Plane : TheC²⁷⁰⁴
- Plane : TheT²⁷⁰⁵
- Plane : TheZ²⁷⁰⁶
- Polygon : ID²⁷⁰⁷
- Polygon : Points²⁷⁰⁸
- ROI : ID²⁷⁰⁹
- Rectangle : Height²⁷¹⁰
- Rectangle : ID²⁷¹¹
- Rectangle : Width²⁷¹²
- Rectangle : X²⁷¹³
- Rectangle : Y²⁷¹⁴
- TransmittanceRange : CutIn²⁷¹⁵
- TransmittanceRange : CutOut²⁷¹⁶

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 version²⁷¹⁷](#) or the [previous versions²⁷¹⁸](#) page to find documentation for the version you are using.

18.2.70 LeicaSCNReader

This page lists supported metadata fields for the Bio-Formats Leica SCN format reader.

These fields are from the [OME data model²⁷¹⁹](#). 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 : ID²⁷²⁰

²⁷⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁷⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁷⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁷⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁷⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

²⁷⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

²⁷¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

²⁷¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁷¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

²⁷¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

²⁷¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

²⁷¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn

²⁷¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut

²⁷¹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁷¹⁸<http://www.openmicroscopy.org/site/support/legacy/>

²⁷¹⁹<http://www.openmicroscopy.org/site/support/ome-model/>

²⁷²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

- Channel : IlluminationType²⁷²¹
- Channel : SamplesPerPixel²⁷²²
- Image : AcquisitionDate²⁷²³
- Image : Description²⁷²⁴
- Image : ID²⁷²⁵
- Image : InstrumentRef²⁷²⁶
- Image : Name²⁷²⁷
- Instrument : ID²⁷²⁸
- Objective : CalibratedMagnification²⁷²⁹
- Objective : ID²⁷³⁰
- Objective : LensNA²⁷³¹
- Objective : NominalMagnification²⁷³²
- ObjectiveSettings : ID²⁷³³
- Pixels : BigEndian²⁷³⁴
- Pixels : DimensionOrder²⁷³⁵
- Pixels : ID²⁷³⁶
- Pixels : Interleaved²⁷³⁷
- Pixels : PhysicalSizeX²⁷³⁸
- Pixels : PhysicalSizeY²⁷³⁹
- Pixels : PhysicalSizeZ²⁷⁴⁰
- Pixels : SignificantBits²⁷⁴¹
- Pixels : SizeC²⁷⁴²
- Pixels : SizeT²⁷⁴³
- Pixels : SizeX²⁷⁴⁴
- Pixels : SizeY²⁷⁴⁵
- Pixels : SizeZ²⁷⁴⁶

²⁷²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_IlluminationType

²⁷²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁷²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁷²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁷²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁷²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁷²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁷²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁷²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

²⁷³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²⁷³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²⁷³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

²⁷³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

²⁷³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁷³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁷³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁷³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁷³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁷³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁷⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²⁷⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁷⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁷⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁷⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁷⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁷⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

- Pixels : Type²⁷⁴⁷
- Plane : PositionX²⁷⁴⁸
- Plane : PositionY²⁷⁴⁹
- Plane : TheC²⁷⁵⁰
- Plane : TheT²⁷⁵¹
- Plane : TheZ²⁷⁵²

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 version²⁷⁵³ or the previous versions²⁷⁵⁴ page to find documentation for the version you are using.

18.2.71 LEORReader

This page lists supported metadata fields for the Bio-Formats LEO format reader.

These fields are from the OME data model²⁷⁵⁵. 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 : ID²⁷⁵⁶
- Channel : SamplesPerPixel²⁷⁵⁷
- Image : AcquisitionDate²⁷⁵⁸
- Image : ID²⁷⁵⁹
- Image : InstrumentRef²⁷⁶⁰
- Image : Name²⁷⁶¹
- Instrument : ID²⁷⁶²
- Objective : Correction²⁷⁶³

²⁷⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁷⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²⁷⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²⁷⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁷⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁷⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁷⁵³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁷⁵⁴<http://www.openmicroscopy.org/site/support/legacy/>

²⁷⁵⁵<http://www.openmicroscopy.org/site/support/ome-model/>

²⁷⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁷⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁷⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁷⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁷⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁷⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁷⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁷⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

- Objective : ID²⁷⁶⁴
- Objective : Immersion²⁷⁶⁵
- Objective : WorkingDistance²⁷⁶⁶
- Pixels : BigEndian²⁷⁶⁷
- Pixels : DimensionOrder²⁷⁶⁸
- Pixels : ID²⁷⁶⁹
- Pixels : Interleaved²⁷⁷⁰
- Pixels : PhysicalSizeX²⁷⁷¹
- Pixels : PhysicalSizeY²⁷⁷²
- Pixels : SignificantBits²⁷⁷³
- Pixels : SizeC²⁷⁷⁴
- Pixels : SizeT²⁷⁷⁵
- Pixels : SizeX²⁷⁷⁶
- Pixels : SizeY²⁷⁷⁷
- Pixels : SizeZ²⁷⁷⁸
- Pixels : Type²⁷⁷⁹
- Plane : TheC²⁷⁸⁰
- Plane : TheT²⁷⁸¹
- Plane : TheZ²⁷⁸²

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 version²⁷⁸³ or the previous versions²⁷⁸⁴ page to find documentation for the version you are using.

18.2.72 L2DReader

This page lists supported metadata fields for the Bio-Formats Li-Cor L2D format reader.

- ²⁷⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID
- ²⁷⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion
- ²⁷⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance
- ²⁷⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ²⁷⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ²⁷⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ²⁷⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ²⁷⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ²⁷⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ²⁷⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ²⁷⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ²⁷⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ²⁷⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ²⁷⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ²⁷⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ²⁷⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ²⁷⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ²⁷⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ²⁷⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ²⁷⁸³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ²⁷⁸⁴<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)²⁷⁸⁵. 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 : ID²⁷⁸⁶
- Channel : LightSourceSettingsID²⁷⁸⁷
- Channel : SamplesPerPixel²⁷⁸⁸
- Image : AcquisitionDate²⁷⁸⁹
- Image : Description²⁷⁹⁰
- Image : ID²⁷⁹¹
- Image : InstrumentRef²⁷⁹²
- Image : Name²⁷⁹³
- Instrument : ID²⁷⁹⁴
- Laser : ID²⁷⁹⁵
- Laser : LaserMedium²⁷⁹⁶
- Laser : Type²⁷⁹⁷
- Laser : Wavelength²⁷⁹⁸
- Microscope : Model²⁷⁹⁹
- Microscope : Type²⁸⁰⁰
- Pixels : BigEndian²⁸⁰¹
- Pixels : DimensionOrder²⁸⁰²
- Pixels : ID²⁸⁰³
- Pixels : Interleaved²⁸⁰⁴
- Pixels : SignificantBits²⁸⁰⁵

²⁷⁸⁵<http://www.openmicroscopy.org/site/support/ome-model/>

²⁷⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁷⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID

²⁷⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁷⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁷⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁷⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁷⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁷⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁷⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁷⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

²⁷⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

²⁷⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

²⁷⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

²⁷⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁸⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Microscope_Type

²⁸⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁸⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁸⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁸⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁸⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

- Pixels : SizeC²⁸⁰⁶
- Pixels : SizeT²⁸⁰⁷
- Pixels : SizeX²⁸⁰⁸
- Pixels : SizeY²⁸⁰⁹
- Pixels : SizeZ²⁸¹⁰
- Pixels : Type²⁸¹¹
- Plane : TheC²⁸¹²
- Plane : TheT²⁸¹³
- Plane : TheZ²⁸¹⁴

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 version²⁸¹⁵](#) or the [previous versions²⁸¹⁶](#) page to find documentation for the version you are using.

18.2.73 LIMReader

This page lists supported metadata fields for the Bio-Formats Laboratory Imaging format reader.

These fields are from the [OME data model²⁸¹⁷](#). 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 : ID²⁸¹⁸
- Channel : SamplesPerPixel²⁸¹⁹
- Image : AcquisitionDate²⁸²⁰
- Image : ID²⁸²¹
- Image : Name²⁸²²

²⁸⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁸⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁸⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁸⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁸¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁸¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁸¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁸¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁸¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁸¹⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁸¹⁶<http://www.openmicroscopy.org/site/support/legacy/>

²⁸¹⁷<http://www.openmicroscopy.org/site/support/ome-model/>

²⁸¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁸¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁸²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁸²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁸²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

- Pixels : BigEndian²⁸²³
- Pixels : DimensionOrder²⁸²⁴
- Pixels : ID²⁸²⁵
- Pixels : Interleaved²⁸²⁶
- Pixels : SignificantBits²⁸²⁷
- Pixels : SizeC²⁸²⁸
- Pixels : SizeT²⁸²⁹
- Pixels : SizeX²⁸³⁰
- Pixels : SizeY²⁸³¹
- Pixels : SizeZ²⁸³²
- Pixels : Type²⁸³³
- Plane : TheC²⁸³⁴
- Plane : TheT²⁸³⁵
- Plane : TheZ²⁸³⁶

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 version²⁸³⁷ or the previous versions²⁸³⁸ page to find documentation for the version you are using.

18.2.74 MetamorphTiffReader

This page lists supported metadata fields for the Bio-Formats Metamorph TIFF format reader.

These fields are from the OME data model²⁸³⁹. 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:

- ²⁸²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ²⁸²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ²⁸²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ²⁸²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ²⁸²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ²⁸²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ²⁸²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ²⁸³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ²⁸³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ²⁸³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ²⁸³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ²⁸³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ²⁸³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ²⁸³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ²⁸³⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ²⁸³⁸<http://www.openmicroscopy.org/site/support/legacy/>
- ²⁸³⁹<http://www.openmicroscopy.org/site/support/ome-model/>

- Channel : ID²⁸⁴⁰
- Channel : Name²⁸⁴¹
- Channel : SamplesPerPixel²⁸⁴²
- Image : AcquisitionDate²⁸⁴³
- Image : Description²⁸⁴⁴
- Image : ID²⁸⁴⁵
- Image : Name²⁸⁴⁶
- ImagingEnvironment : Temperature²⁸⁴⁷
- Pixels : BigEndian²⁸⁴⁸
- Pixels : DimensionOrder²⁸⁴⁹
- Pixels : ID²⁸⁵⁰
- Pixels : Interleaved²⁸⁵¹
- Pixels : PhysicalSizeX²⁸⁵²
- Pixels : PhysicalSizeY²⁸⁵³
- Pixels : PhysicalSizeZ²⁸⁵⁴
- Pixels : SignificantBits²⁸⁵⁵
- Pixels : SizeC²⁸⁵⁶
- Pixels : SizeT²⁸⁵⁷
- Pixels : SizeX²⁸⁵⁸
- Pixels : SizeY²⁸⁵⁹
- Pixels : SizeZ²⁸⁶⁰
- Pixels : Type²⁸⁶¹
- Plane : DeltaT²⁸⁶²
- Plane : ExposureTime²⁸⁶³
- Plane : PositionX²⁸⁶⁴
- Plane : PositionY²⁸⁶⁵

²⁸⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁸⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁸⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁸⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁸⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁸⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁸⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁸⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

²⁸⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁸⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁸⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁸⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁸⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁸⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁸⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²⁸⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁸⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁸⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁸⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁸⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁸⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁸⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁸⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²⁸⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁸⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²⁸⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

- Plane : TheC²⁸⁶⁶
- Plane : TheT²⁸⁶⁷
- Plane : TheZ²⁸⁶⁸
- Plate : ColumnNamingConvention²⁸⁶⁹
- Plate : ID²⁸⁷⁰
- Plate : RowNamingConvention²⁸⁷¹
- Well : Column²⁸⁷²
- Well : ID²⁸⁷³
- Well : Row²⁸⁷⁴
- WellSample : ID²⁸⁷⁵
- WellSample : ImageRef²⁸⁷⁶
- WellSample : Index²⁸⁷⁷

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 version²⁸⁷⁸ or the previous versions²⁸⁷⁹ page to find documentation for the version you are using.

18.2.75 MetamorphReader

This page lists supported metadata fields for the Bio-Formats Metamorph STK format reader.

These fields are from the OME data model²⁸⁸⁰. 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 : ID²⁸⁸¹
- Channel : LightSourceSettingsID²⁸⁸²

²⁸⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁸⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁸⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁸⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

²⁸⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

²⁸⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

²⁸⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

²⁸⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

²⁸⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

²⁸⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

²⁸⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

²⁸⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

²⁸⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁸⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

²⁸⁸⁰<http://www.openmicroscopy.org/site/support/ome-model/>

²⁸⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁸⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID

- Channel : LightSourceSettingsWavelength²⁸⁸³
- Channel : Name²⁸⁸⁴
- Channel : SamplesPerPixel²⁸⁸⁵
- Detector : ID²⁸⁸⁶
- Detector : Type²⁸⁸⁷
- DetectorSettings : Binning²⁸⁸⁸
- DetectorSettings : Gain²⁸⁸⁹
- DetectorSettings : ID²⁸⁹⁰
- DetectorSettings : ReadOutRate²⁸⁹¹
- Image : AcquisitionDate²⁸⁹²
- Image : Description²⁸⁹³
- Image : ID²⁸⁹⁴
- Image : InstrumentRef²⁸⁹⁵
- Image : Name²⁸⁹⁶
- ImagingEnvironment : Temperature²⁸⁹⁷
- Instrument : ID²⁸⁹⁸
- Laser : ID²⁸⁹⁹
- Laser : LaserMedium²⁹⁰⁰
- Laser : Type²⁹⁰¹
- Objective : ID²⁹⁰²
- Objective : LensNA²⁹⁰³
- ObjectiveSettings : ID²⁹⁰⁴
- Pixels : BigEndian²⁹⁰⁵
- Pixels : DimensionOrder²⁹⁰⁶
- Pixels : ID²⁹⁰⁷
- Pixels : Interleaved²⁹⁰⁸

²⁸⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_Wavelength

²⁸⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁸⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁸⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

²⁸⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

²⁸⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

²⁸⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

²⁸⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

²⁸⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

²⁸⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁸⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

²⁸⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁸⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁸⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁸⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

²⁸⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁸⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

²⁹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

²⁹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

²⁹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²⁹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

²⁹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

²⁹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

- Pixels : PhysicalSizeX²⁹⁰⁹
- Pixels : PhysicalSizeY²⁹¹⁰
- Pixels : PhysicalSizeZ²⁹¹¹
- Pixels : SignificantBits²⁹¹²
- Pixels : SizeC²⁹¹³
- Pixels : SizeT²⁹¹⁴
- Pixels : SizeX²⁹¹⁵
- Pixels : SizeY²⁹¹⁶
- Pixels : SizeZ²⁹¹⁷
- Pixels : Type²⁹¹⁸
- Plane : DeltaT²⁹¹⁹
- Plane : ExposureTime²⁹²⁰
- Plane : PositionX²⁹²¹
- Plane : PositionY²⁹²²
- Plane : PositionZ²⁹²³
- Plane : TheC²⁹²⁴
- Plane : TheT²⁹²⁵
- Plane : TheZ²⁹²⁶

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 version²⁹²⁷ or the previous versions²⁹²⁸ page to find documentation for the version you are using.

18.2.76 MIASReader

This page lists supported metadata fields for the Bio-Formats MIAS format reader.

These fields are from the OME data model²⁹²⁹. 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*:

²⁹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

²⁹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

²⁹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

²⁹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

²⁹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

²⁹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

²⁹²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁹²⁸<http://www.openmicroscopy.org/site/support/legacy/>

²⁹²⁹<http://www.openmicroscopy.org/site/support/ome-model/>

- 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 : Color²⁹³⁰
- Channel : ID²⁹³¹
- Channel : Name²⁹³²
- Channel : SamplesPerPixel²⁹³³
- Ellipse : ID²⁹³⁴
- Ellipse : RadiusX²⁹³⁵
- Ellipse : RadiusY²⁹³⁶
- Ellipse : Text²⁹³⁷
- Ellipse : TheT²⁹³⁸
- Ellipse : TheZ²⁹³⁹
- Ellipse : X²⁹⁴⁰
- Ellipse : Y²⁹⁴¹
- Experiment : Description²⁹⁴²
- Experiment : ID²⁹⁴³
- Experiment : Type²⁹⁴⁴
- Image : AcquisitionDate²⁹⁴⁵
- Image : ExperimentRef²⁹⁴⁶
- Image : ID²⁹⁴⁷
- Image : InstrumentRef²⁹⁴⁸
- Image : Name²⁹⁴⁹
- Image : ROIRef²⁹⁵⁰
- Instrument : ID²⁹⁵¹
- Mask : FillColor²⁹⁵²

²⁹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

²⁹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

²⁹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusX

²⁹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusY

²⁹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

²⁹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

²⁹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

²⁹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_X

²⁹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_Y

²⁹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Description

²⁹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID

²⁹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type

²⁹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

²⁹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimentRef_ID

²⁹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

²⁹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

²⁹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

²⁹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

²⁹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

²⁹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FillColor

- Mask : Height²⁹⁵³
- Mask : ID²⁹⁵⁴
- Mask : StrokeColor²⁹⁵⁵
- Mask : Width²⁹⁵⁶
- Mask : X²⁹⁵⁷
- Mask : Y²⁹⁵⁸
- Objective : ID²⁹⁵⁹
- Objective : Model²⁹⁶⁰
- Objective : NominalMagnification²⁹⁶¹
- Pixels : BigEndian²⁹⁶²
- Pixels : DimensionOrder²⁹⁶³
- Pixels : ID²⁹⁶⁴
- Pixels : Interleaved²⁹⁶⁵
- Pixels : PhysicalSizeX²⁹⁶⁶
- Pixels : PhysicalSizeY²⁹⁶⁷
- Pixels : SignificantBits²⁹⁶⁸
- Pixels : SizeC²⁹⁶⁹
- Pixels : SizeT²⁹⁷⁰
- Pixels : SizeX²⁹⁷¹
- Pixels : SizeY²⁹⁷²
- Pixels : SizeZ²⁹⁷³
- Pixels : Type²⁹⁷⁴
- Plane : ExposureTime²⁹⁷⁵
- Plane : TheC²⁹⁷⁶
- Plane : TheT²⁹⁷⁷
- Plane : TheZ²⁹⁷⁸

²⁹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Height

²⁹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

²⁹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeColor

²⁹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Width

²⁹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_X

²⁹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Y

²⁹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

²⁹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

²⁹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

²⁹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

²⁹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

²⁹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

²⁹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

²⁹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

²⁹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

²⁹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

²⁹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

²⁹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

²⁹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

²⁹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

²⁹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

²⁹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

²⁹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

²⁹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

²⁹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

²⁹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

- Plate : ColumnNamingConvention²⁹⁷⁹
- Plate : ExternalIdentifier²⁹⁸⁰
- Plate : ID²⁹⁸¹
- Plate : Name²⁹⁸²
- Plate : RowNamingConvention²⁹⁸³
- PlateAcquisition : ID²⁹⁸⁴
- PlateAcquisition : MaximumFieldCount²⁹⁸⁵
- PlateAcquisition : WellSampleRef²⁹⁸⁶
- ROI : ID²⁹⁸⁷
- Well : Column²⁹⁸⁸
- Well : ID²⁹⁸⁹
- Well : Row²⁹⁹⁰
- WellSample : ID²⁹⁹¹
- WellSample : ImageRef²⁹⁹²
- WellSample : Index²⁹⁹³

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 version²⁹⁹⁴ or the previous versions²⁹⁹⁵ page to find documentation for the version you are using.

18.2.77 MicromanagerReader

This page lists supported metadata fields for the Bio-Formats Micro-Manager format reader.

These fields are from the OME data model²⁹⁹⁶. 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%).

²⁹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

²⁹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ExternalIdentifier

²⁹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

²⁹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

²⁹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

²⁹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

²⁹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

²⁹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

²⁹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

²⁹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

²⁹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

²⁹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

²⁹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

²⁹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

²⁹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

²⁹⁹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

²⁹⁹⁵<http://www.openmicroscopy.org/site/support/legacy/>

²⁹⁹⁶<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Micro-Manager format reader:

- Channel : ID²⁹⁹⁷
- Channel : Name²⁹⁹⁸
- Channel : SamplesPerPixel²⁹⁹⁹
- Detector : ID³⁰⁰⁰
- Detector : Manufacturer³⁰⁰¹
- Detector : Model³⁰⁰²
- Detector : SerialNumber³⁰⁰³
- Detector : Type³⁰⁰⁴
- DetectorSettings : Binning³⁰⁰⁵
- DetectorSettings : Gain³⁰⁰⁶
- DetectorSettings : ID³⁰⁰⁷
- DetectorSettings : Voltage³⁰⁰⁸
- Image : AcquisitionDate³⁰⁰⁹
- Image : Description³⁰¹⁰
- Image : ID³⁰¹¹
- Image : InstrumentRef³⁰¹²
- Image : Name³⁰¹³
- ImagingEnvironment : Temperature³⁰¹⁴
- Instrument : ID³⁰¹⁵
- Pixels : BigEndian³⁰¹⁶
- Pixels : DimensionOrder³⁰¹⁷
- Pixels : ID³⁰¹⁸
- Pixels : Interleaved³⁰¹⁹
- Pixels : PhysicalSizeX³⁰²⁰

²⁹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

²⁹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

²⁹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁰⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³⁰⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

³⁰⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁰⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

³⁰⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³⁰⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

³⁰⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

³⁰⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³⁰⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

³⁰⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁰¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³⁰¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁰¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³⁰¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁰¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

³⁰¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁰¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁰¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁰¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁰¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁰²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

- Pixels : PhysicalSizeY³⁰²¹
- Pixels : PhysicalSizeZ³⁰²²
- Pixels : SignificantBits³⁰²³
- Pixels : SizeC³⁰²⁴
- Pixels : SizeT³⁰²⁵
- Pixels : SizeX³⁰²⁶
- Pixels : SizeY³⁰²⁷
- Pixels : SizeZ³⁰²⁸
- Pixels : Type³⁰²⁹
- Plane : DeltaT³⁰³⁰
- Plane : ExposureTime³⁰³¹
- Plane : TheC³⁰³²
- Plane : TheT³⁰³³
- Plane : TheZ³⁰³⁴

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 version³⁰³⁵ or the previous versions³⁰³⁶ page to find documentation for the version you are using.

18.2.78 MINCReader

This page lists supported metadata fields for the Bio-Formats MINC MRI format reader.

These fields are from the OME data model³⁰³⁷. 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:

³⁰²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁰²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³⁰²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁰²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁰²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁰²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁰²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁰²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁰²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁰³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³⁰³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁰³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁰³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁰³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁰³⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰³⁶<http://www.openmicroscopy.org/site/support/legacy/>

³⁰³⁷<http://www.openmicroscopy.org/site/support/ome-model/>

- Channel : ID³⁰³⁸
- Channel : SamplesPerPixel³⁰³⁹
- Image : AcquisitionDate³⁰⁴⁰
- Image : Description³⁰⁴¹
- Image : ID³⁰⁴²
- Image : Name³⁰⁴³
- Pixels : BigEndian³⁰⁴⁴
- Pixels : DimensionOrder³⁰⁴⁵
- Pixels : ID³⁰⁴⁶
- Pixels : Interleaved³⁰⁴⁷
- Pixels : PhysicalSizeX³⁰⁴⁸
- Pixels : PhysicalSizeY³⁰⁴⁹
- Pixels : PhysicalSizeZ³⁰⁵⁰
- Pixels : SignificantBits³⁰⁵¹
- Pixels : SizeC³⁰⁵²
- Pixels : SizeT³⁰⁵³
- Pixels : SizeX³⁰⁵⁴
- Pixels : SizeY³⁰⁵⁵
- Pixels : SizeZ³⁰⁵⁶
- Pixels : Type³⁰⁵⁷
- Plane : TheC³⁰⁵⁸
- Plane : TheT³⁰⁵⁹
- Plane : TheZ³⁰⁶⁰

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 version³⁰⁶¹ or the previous versions³⁰⁶² page to find documentation for the version you are using.

³⁰³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

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#Image_AcquisitionDate

³⁰⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³⁰⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁰⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁰⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁰⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁰⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁰⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁰⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁰⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁰⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³⁰⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁰⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁰⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁰⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁰⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁰⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁰⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁰⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁰⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁰⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁰⁶¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰⁶²<http://www.openmicroscopy.org/site/support/legacy/>

18.2.79 MRWReader

This page lists supported metadata fields for the Bio-Formats Minolta MRW format reader.

These fields are from the [OME data model](#)³⁰⁶³. 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 : ID³⁰⁶⁴
- Channel : SamplesPerPixel³⁰⁶⁵
- Image : AcquisitionDate³⁰⁶⁶
- Image : ID³⁰⁶⁷
- Image : Name³⁰⁶⁸
- Pixels : BigEndian³⁰⁶⁹
- Pixels : DimensionOrder³⁰⁷⁰
- Pixels : ID³⁰⁷¹
- Pixels : Interleaved³⁰⁷²
- Pixels : SignificantBits³⁰⁷³
- Pixels : SizeC³⁰⁷⁴
- Pixels : SizeT³⁰⁷⁵
- Pixels : SizeX³⁰⁷⁶
- Pixels : SizeY³⁰⁷⁷
- Pixels : SizeZ³⁰⁷⁸
- Pixels : Type³⁰⁷⁹
- Plane : TheC³⁰⁸⁰

³⁰⁶³<http://www.openmicroscopy.org/site/support/ome-model/>

³⁰⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁰⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁰⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁰⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁰⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁰⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁰⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁰⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁰⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁰⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁰⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁰⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁰⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁰⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁰⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁰⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁰⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

- Plane : TheT³⁰⁸¹
- Plane : TheZ³⁰⁸²

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 version³⁰⁸³ or the previous versions³⁰⁸⁴ page to find documentation for the version you are using.

18.2.80 MNGReader

This page lists supported metadata fields for the Bio-Formats Multiple Network Graphics format reader.

These fields are from the OME data model³⁰⁸⁵. 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 Multiple Network Graphics format reader:

- Channel : ID³⁰⁸⁶
- Channel : SamplesPerPixel³⁰⁸⁷
- Image : AcquisitionDate³⁰⁸⁸
- Image : ID³⁰⁸⁹
- Image : Name³⁰⁹⁰
- Pixels : BigEndian³⁰⁹¹
- Pixels : DimensionOrder³⁰⁹²
- Pixels : ID³⁰⁹³
- Pixels : Interleaved³⁰⁹⁴
- Pixels : SignificantBits³⁰⁹⁵
- Pixels : SizeC³⁰⁹⁶
- Pixels : SizeT³⁰⁹⁷

³⁰⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁰⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁰⁸³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁰⁸⁴<http://www.openmicroscopy.org/site/support/legacy/>

³⁰⁸⁵<http://www.openmicroscopy.org/site/support/ome-model/>

³⁰⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁰⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁰⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁰⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁰⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁰⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁰⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁰⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁰⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁰⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁰⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁰⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

- Pixels : SizeX³⁰⁹⁸
- Pixels : SizeY³⁰⁹⁹
- Pixels : SizeZ³¹⁰⁰
- Pixels : Type³¹⁰¹
- Plane : TheC³¹⁰²
- Plane : TheT³¹⁰³
- Plane : TheZ³¹⁰⁴

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 version³¹⁰⁵](#) or the [previous versions³¹⁰⁶](#) page to find documentation for the version you are using.

18.2.81 MolecularImagingReader

This page lists supported metadata fields for the Bio-Formats Molecular Imaging format reader.

These fields are from the [OME data model³¹⁰⁷](#). 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 : ID³¹⁰⁸
- Channel : SamplesPerPixel³¹⁰⁹
- Image : AcquisitionDate³¹¹⁰
- Image : ID³¹¹¹
- Image : Name³¹¹²
- Pixels : BigEndian³¹¹³
- Pixels : DimensionOrder³¹¹⁴

³⁰⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁰⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³¹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³¹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³¹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³¹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³¹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³¹⁰⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹⁰⁶<http://www.openmicroscopy.org/site/support/legacy/>

³¹⁰⁷<http://www.openmicroscopy.org/site/support/ome-model/>

³¹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³¹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³¹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³¹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³¹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³¹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³¹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID³¹¹⁵
- Pixels : Interleaved³¹¹⁶
- Pixels : PhysicalSizeX³¹¹⁷
- Pixels : PhysicalSizeY³¹¹⁸
- Pixels : SignificantBits³¹¹⁹
- Pixels : SizeC³¹²⁰
- Pixels : SizeT³¹²¹
- Pixels : SizeX³¹²²
- Pixels : SizeY³¹²³
- Pixels : SizeZ³¹²⁴
- Pixels : Type³¹²⁵
- Plane : TheC³¹²⁶
- Plane : TheT³¹²⁷
- Plane : TheZ³¹²⁸

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 version³¹²⁹ or the previous versions³¹³⁰ page to find documentation for the version you are using.

18.2.82 MRCReader

This page lists supported metadata fields for the Bio-Formats Medical Research Council format reader.

These fields are from the OME data model³¹³¹. 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:

- ³¹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ³¹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ³¹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ³¹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ³¹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ³¹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ³¹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ³¹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ³¹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ³¹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ³¹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ³¹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ³¹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ³¹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ³¹²⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ³¹³⁰<http://www.openmicroscopy.org/site/support/legacy/>
- ³¹³¹<http://www.openmicroscopy.org/site/support/ome-model/>

- Channel : ID³¹³²
- Channel : SamplesPerPixel³¹³³
- Image : AcquisitionDate³¹³⁴
- Image : ID³¹³⁵
- Image : Name³¹³⁶
- Pixels : BigEndian³¹³⁷
- Pixels : DimensionOrder³¹³⁸
- Pixels : ID³¹³⁹
- Pixels : Interleaved³¹⁴⁰
- Pixels : PhysicalSizeX³¹⁴¹
- Pixels : PhysicalSizeY³¹⁴²
- Pixels : PhysicalSizeZ³¹⁴³
- Pixels : SignificantBits³¹⁴⁴
- Pixels : SizeC³¹⁴⁵
- Pixels : SizeT³¹⁴⁶
- Pixels : SizeX³¹⁴⁷
- Pixels : SizeY³¹⁴⁸
- Pixels : SizeZ³¹⁴⁹
- Pixels : Type³¹⁵⁰
- Plane : TheC³¹⁵¹
- Plane : TheT³¹⁵²
- Plane : TheZ³¹⁵³

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 version³¹⁵⁴ or the previous versions³¹⁵⁵ page to find documentation for the version you are using.

³¹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³¹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³¹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³¹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³¹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³¹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³¹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³¹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³¹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³¹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³¹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³¹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³¹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³¹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³¹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³¹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³¹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³¹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³¹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³¹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³¹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³¹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³¹⁵⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹⁵⁵<http://www.openmicroscopy.org/site/support/legacy/>

18.2.83 NikonReader

This page lists supported metadata fields for the Bio-Formats Nikon NEF format reader.

These fields are from the [OME data model](#)³¹⁵⁶. 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 : ID³¹⁵⁷
- Channel : SamplesPerPixel³¹⁵⁸
- Image : AcquisitionDate³¹⁵⁹
- Image : ID³¹⁶⁰
- Image : Name³¹⁶¹
- Pixels : BigEndian³¹⁶²
- Pixels : DimensionOrder³¹⁶³
- Pixels : ID³¹⁶⁴
- Pixels : Interleaved³¹⁶⁵
- Pixels : SignificantBits³¹⁶⁶
- Pixels : SizeC³¹⁶⁷
- Pixels : SizeT³¹⁶⁸
- Pixels : SizeX³¹⁶⁹
- Pixels : SizeY³¹⁷⁰
- Pixels : SizeZ³¹⁷¹
- Pixels : Type³¹⁷²
- Plane : TheC³¹⁷³
- Plane : TheT³¹⁷⁴

³¹⁵⁶<http://www.openmicroscopy.org/site/support/ome-model/>

³¹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³¹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³¹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³¹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³¹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³¹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³¹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³¹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³¹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³¹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³¹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³¹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³¹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³¹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³¹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³¹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³¹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³¹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ³¹⁷⁵

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 version³¹⁷⁶](#) or the [previous versions³¹⁷⁷](#) page to find documentation for the version you are using.

18.2.84 NiftiReader

This page lists supported metadata fields for the Bio-Formats NIFTI format reader.

These fields are from the [OME data model³¹⁷⁸](#). 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 NIFTI format reader:

- Channel : ID³¹⁷⁹
- Channel : SamplesPerPixel³¹⁸⁰
- Image : AcquisitionDate³¹⁸¹
- Image : Description³¹⁸²
- Image : ID³¹⁸³
- Image : Name³¹⁸⁴
- Pixels : BigEndian³¹⁸⁵
- Pixels : DimensionOrder³¹⁸⁶
- Pixels : ID³¹⁸⁷
- Pixels : Interleaved³¹⁸⁸
- Pixels : PhysicalSizeX³¹⁸⁹
- Pixels : PhysicalSizeY³¹⁹⁰
- Pixels : PhysicalSizeZ³¹⁹¹

³¹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³¹⁷⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³¹⁷⁷<http://www.openmicroscopy.org/site/support/legacy/>

³¹⁷⁸<http://www.openmicroscopy.org/site/support/ome-model/>

³¹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³¹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³¹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³¹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³¹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³¹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³¹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³¹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³¹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³¹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³¹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³¹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³¹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

- Pixels : SignificantBits³¹⁹²
- Pixels : SizeC³¹⁹³
- Pixels : SizeT³¹⁹⁴
- Pixels : SizeX³¹⁹⁵
- Pixels : SizeY³¹⁹⁶
- Pixels : SizeZ³¹⁹⁷
- Pixels : TimeIncrement³¹⁹⁸
- Pixels : Type³¹⁹⁹
- Plane : TheC³²⁰⁰
- Plane : TheT³²⁰¹
- Plane : TheZ³²⁰²

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 version³²⁰³](#) or the [previous versions³²⁰⁴](#) page to find documentation for the version you are using.

18.2.85 NikonElementsTiffReader

This page lists supported metadata fields for the Bio-Formats Nikon Elements TIFF format reader.

These fields are from the [OME data model³²⁰⁵](#). 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 : AcquisitionMode³²⁰⁶
- Channel : EmissionWavelength³²⁰⁷
- Channel : ExcitationWavelength³²⁰⁸

³¹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³¹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³¹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³¹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³¹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³¹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³¹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

³¹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³²⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³²⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³²⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³²⁰³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²⁰⁴<http://www.openmicroscopy.org/site/support/legacy/>

³²⁰⁵<http://www.openmicroscopy.org/site/support/ome-model/>

³²⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_AcquisitionMode

³²⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

³²⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

- Channel : ID³²⁰⁹
- Channel : Name³²¹⁰
- Channel : PinholeSize³²¹¹
- Channel : SamplesPerPixel³²¹²
- Detector : ID³²¹³
- Detector : Model³²¹⁴
- Detector : Type³²¹⁵
- DetectorSettings : Binning³²¹⁶
- DetectorSettings : Gain³²¹⁷
- DetectorSettings : ID³²¹⁸
- DetectorSettings : ReadOutRate³²¹⁹
- DetectorSettings : Voltage³²²⁰
- Image : AcquisitionDate³²²¹
- Image : ID³²²²
- Image : InstrumentRef³²²³
- Image : Name³²²⁴
- ImagingEnvironment : Temperature³²²⁵
- Instrument : ID³²²⁶
- Objective : CalibratedMagnification³²²⁷
- Objective : Correction³²²⁸
- Objective : ID³²²⁹
- Objective : Immersion³²³⁰
- Objective : LensNA³²³¹
- Objective : Model³²³²
- ObjectiveSettings : ID³²³³
- ObjectiveSettings : RefractiveIndex³²³⁴

³²⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³²¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³²¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

³²¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³²¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³²¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³²¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³²¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

³²¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

³²¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³²¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

³²²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

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_ID

³²²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_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#ImagingEnvironment_Temperature

³²²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³²²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

³²²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³²²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³²³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³²³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

³²³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³²³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³²³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

- Pixels : BigEndian³²³⁵
- Pixels : DimensionOrder³²³⁶
- Pixels : ID³²³⁷
- Pixels : Interleaved³²³⁸
- Pixels : PhysicalSizeX³²³⁹
- Pixels : PhysicalSizeY³²⁴⁰
- Pixels : PhysicalSizeZ³²⁴¹
- Pixels : SignificantBits³²⁴²
- Pixels : SizeC³²⁴³
- Pixels : SizeT³²⁴⁴
- Pixels : SizeX³²⁴⁵
- Pixels : SizeY³²⁴⁶
- Pixels : SizeZ³²⁴⁷
- Pixels : Type³²⁴⁸
- Plane : ExposureTime³²⁴⁹
- Plane : PositionX³²⁵⁰
- Plane : PositionY³²⁵¹
- Plane : PositionZ³²⁵²
- Plane : TheC³²⁵³
- Plane : TheT³²⁵⁴
- Plane : TheZ³²⁵⁵

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 version³²⁵⁶ or the previous versions³²⁵⁷ page to find documentation for the version you are using.

³²³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³²³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³²³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³²³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³²³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³²⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³²⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³²⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³²⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³²⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³²⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³²⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³²⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³²⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³²⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³²⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³²⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³²⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³²⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³²⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³²⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³²⁵⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³²⁵⁷<http://www.openmicroscopy.org/site/support/legacy/>

18.2.86 NikonTiffReader

This page lists supported metadata fields for the Bio-Formats Nikon TIFF format reader.

These fields are from the [OME data model](#)³²⁵⁸. 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 : EmissionWavelength³²⁵⁹
- Channel : ExcitationWavelength³²⁶⁰
- Channel : ID³²⁶¹
- Channel : PinholeSize³²⁶²
- Channel : SamplesPerPixel³²⁶³
- Detector : Gain³²⁶⁴
- Detector : ID³²⁶⁵
- Detector : Type³²⁶⁶
- Dichroic : ID³²⁶⁷
- Dichroic : Model³²⁶⁸
- Filter : ID³²⁶⁹
- Filter : Model³²⁷⁰
- Image : AcquisitionDate³²⁷¹
- Image : Description³²⁷²
- Image : ID³²⁷³
- Image : InstrumentRef³²⁷⁴
- Image : Name³²⁷⁵
- Instrument : ID³²⁷⁶

³²⁵⁸<http://www.openmicroscopy.org/site/support/ome-model/>

³²⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

³²⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

³²⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³²⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

³²⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³²⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

³²⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³²⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³²⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

³²⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³²⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

³²⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³²⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³²⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³²⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³²⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³²⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³²⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

- Laser : ID³²⁷⁷
- Laser : LaserMedium³²⁷⁸
- Laser : Model³²⁷⁹
- Laser : Type³²⁸⁰
- Laser : Wavelength³²⁸¹
- Objective : Correction³²⁸²
- Objective : ID³²⁸³
- Objective : Immersion³²⁸⁴
- Objective : LensNA³²⁸⁵
- Objective : NominalMagnification³²⁸⁶
- Objective : WorkingDistance³²⁸⁷
- ObjectiveSettings : ID³²⁸⁸
- Pixels : BigEndian³²⁸⁹
- Pixels : DimensionOrder³²⁹⁰
- Pixels : ID³²⁹¹
- Pixels : Interleaved³²⁹²
- Pixels : PhysicalSizeX³²⁹³
- Pixels : PhysicalSizeY³²⁹⁴
- Pixels : PhysicalSizeZ³²⁹⁵
- Pixels : SignificantBits³²⁹⁶
- Pixels : SizeC³²⁹⁷
- Pixels : SizeT³²⁹⁸
- Pixels : SizeX³²⁹⁹
- Pixels : SizeY³³⁰⁰
- Pixels : SizeZ³³⁰¹
- Pixels : Type³³⁰²

³²⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

³²⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

³²⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³²⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

³²⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

³²⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³²⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³²⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³²⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

³²⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

³²⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

³²⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³²⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³²⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³²⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³²⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³²⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³²⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³²⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³²⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³²⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³²⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³²⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³³⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³³⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³³⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC³³⁰³
- Plane : TheT³³⁰⁴
- Plane : TheZ³³⁰⁵

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 version³³⁰⁶](#) or the [previous versions³³⁰⁷](#) page to find documentation for the version you are using.

18.2.87 NativeND2Reader

This page lists supported metadata fields for the Bio-Formats Nikon ND2 format reader.

These fields are from the [OME data model³³⁰⁸](#). 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 Nikon ND2 format reader:

- Channel : AcquisitionMode³³⁰⁹
- Channel : Color³³¹⁰
- Channel : EmissionWavelength³³¹¹
- Channel : ExcitationWavelength³³¹²
- Channel : ID³³¹³
- Channel : Name³³¹⁴
- Channel : PinholeSize³³¹⁵
- Channel : SamplesPerPixel³³¹⁶
- Detector : ID³³¹⁷
- Detector : Model³³¹⁸
- Detector : Type³³¹⁹

³³⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³³⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³³⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³³⁰⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³³⁰⁷<http://www.openmicroscopy.org/site/support/legacy/>

³³⁰⁸<http://www.openmicroscopy.org/site/support/ome-model/>

³³⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_AcquisitionMode

³³¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

³³¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

³³¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

³³¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³³¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³³¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

³³¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³³¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³³¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³³¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

- DetectorSettings : Binning³³²⁰
- DetectorSettings : Gain³³²¹
- DetectorSettings : ID³³²²
- DetectorSettings : ReadOutRate³³²³
- DetectorSettings : Voltage³³²⁴
- Image : AcquisitionDate³³²⁵
- Image : ID³³²⁶
- Image : InstrumentRef³³²⁷
- Image : Name³³²⁸
- ImagingEnvironment : Temperature³³²⁹
- Instrument : ID³³³⁰
- Objective : CalibratedMagnification³³³¹
- Objective : Correction³³³²
- Objective : ID³³³³
- Objective : Immersion³³³⁴
- Objective : LensNA³³³⁵
- Objective : Model³³³⁶
- ObjectiveSettings : ID³³³⁷
- ObjectiveSettings : RefractiveIndex³³³⁸
- Pixels : BigEndian³³³⁹
- Pixels : DimensionOrder³³⁴⁰
- Pixels : ID³³⁴¹
- Pixels : Interleaved³³⁴²
- Pixels : PhysicalSizeX³³⁴³
- Pixels : PhysicalSizeY³³⁴⁴
- Pixels : PhysicalSizeZ³³⁴⁵

³³²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

³³²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

³³²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³³²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

³³²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

³³²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³³²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³³²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³³²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³³²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

³³³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³³³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

³³³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³³³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³³³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³³³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

³³³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³³³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³³³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

³³³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³³⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³³⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³³⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³³⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³³⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³³⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

- Pixels : SignificantBits³³⁴⁶
- Pixels : SizeC³³⁴⁷
- Pixels : SizeT³³⁴⁸
- Pixels : SizeX³³⁴⁹
- Pixels : SizeY³³⁵⁰
- Pixels : SizeZ³³⁵¹
- Pixels : Type³³⁵²
- Plane : DeltaT³³⁵³
- Plane : ExposureTime³³⁵⁴
- Plane : PositionX³³⁵⁵
- Plane : PositionY³³⁵⁶
- Plane : PositionZ³³⁵⁷
- Plane : TheC³³⁵⁸
- Plane : TheT³³⁵⁹
- Plane : TheZ³³⁶⁰

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 version³³⁶¹ or the previous versions³³⁶² page to find documentation for the version you are using.

18.2.88 NRRDReader

This page lists supported metadata fields for the Bio-Formats NRRD format reader.

These fields are from the OME data model³³⁶³. 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%).

³³⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³³⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³³⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³³⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³³⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³³⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³³⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³³⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³³⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³³⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³³⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³³⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³³⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³³⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³³⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³³⁶¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³³⁶²<http://www.openmicroscopy.org/site/support/legacy/>

³³⁶³<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats NRRD format reader:

- Channel : ID³³⁶⁴
- Channel : SamplesPerPixel³³⁶⁵
- Image : AcquisitionDate³³⁶⁶
- Image : ID³³⁶⁷
- Image : Name³³⁶⁸
- Pixels : BigEndian³³⁶⁹
- Pixels : DimensionOrder³³⁷⁰
- Pixels : ID³³⁷¹
- Pixels : Interleaved³³⁷²
- Pixels : PhysicalSizeX³³⁷³
- Pixels : PhysicalSizeY³³⁷⁴
- Pixels : PhysicalSizeZ³³⁷⁵
- Pixels : SignificantBits³³⁷⁶
- Pixels : SizeC³³⁷⁷
- Pixels : SizeT³³⁷⁸
- Pixels : SizeX³³⁷⁹
- Pixels : SizeY³³⁸⁰
- Pixels : SizeZ³³⁸¹
- Pixels : Type³³⁸²
- Plane : TheC³³⁸³
- Plane : TheT³³⁸⁴
- Plane : TheZ³³⁸⁵

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 version³³⁸⁶](#) or the [previous](#)

³³⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³³⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³³⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³³⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_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#Pixels_BigEndian

³³⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³³⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³³⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³³⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³³⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³³⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³³⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³³⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³³⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³³⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³³⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³³⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³³⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³³⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³³⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³³⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

[versions³³⁸⁷](#) page to find documentation for the version you are using.

18.2.89 APLReader

This page lists supported metadata fields for the Bio-Formats Olympus APL format reader.

These fields are from the [OME data model³³⁸⁸](#). 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 : ID³³⁸⁹
- Channel : SamplesPerPixel³³⁹⁰
- Image : AcquisitionDate³³⁹¹
- Image : ID³³⁹²
- Image : Name³³⁹³
- Pixels : BigEndian³³⁹⁴
- Pixels : DimensionOrder³³⁹⁵
- Pixels : ID³³⁹⁶
- Pixels : Interleaved³³⁹⁷
- Pixels : PhysicalSizeX³³⁹⁸
- Pixels : PhysicalSizeY³³⁹⁹
- Pixels : SignificantBits³⁴⁰⁰
- Pixels : SizeC³⁴⁰¹
- Pixels : SizeT³⁴⁰²
- Pixels : SizeX³⁴⁰³
- Pixels : SizeY³⁴⁰⁴

³³⁸⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³³⁸⁷<http://www.openmicroscopy.org/site/support/legacy/>

³³⁸⁸<http://www.openmicroscopy.org/site/support/ome-model/>

³³⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³³⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³³⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³³⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³³⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³³⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³³⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³³⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³³⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³³⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³³⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁴⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁴⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁴⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁴⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁴⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ³⁴⁰⁵
- Pixels : Type³⁴⁰⁶
- Plane : TheC³⁴⁰⁷
- Plane : TheT³⁴⁰⁸
- Plane : TheZ³⁴⁰⁹

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 version³⁴¹⁰](#) or the [previous versions³⁴¹¹](#) page to find documentation for the version you are using.

18.2.90 FV1000Reader

This page lists supported metadata fields for the Bio-Formats Olympus FV1000 format reader.

These fields are from the [OME data model³⁴¹²](#). 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 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 : EmissionWavelength³⁴¹³
- Channel : ExcitationWavelength³⁴¹⁴
- Channel : ID³⁴¹⁵
- Channel : IlluminationType³⁴¹⁶
- Channel : LightSourceSettingsID³⁴¹⁷
- Channel : LightSourceSettingsWavelength³⁴¹⁸
- Channel : Name³⁴¹⁹
- Channel : SamplesPerPixel³⁴²⁰
- Detector : Gain³⁴²¹

³⁴⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁴⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁴⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁴⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁴⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁴¹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁴¹¹<http://www.openmicroscopy.org/site/support/legacy/>

³⁴¹²<http://www.openmicroscopy.org/site/support/ome-model/>

³⁴¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

³⁴¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

³⁴¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁴¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_IlluminationType

³⁴¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_ID

³⁴¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSourceSettings_Wavelength

³⁴¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³⁴²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁴²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

- Detector : ID³⁴²²
- Detector : Type³⁴²³
- Detector : Voltage³⁴²⁴
- DetectorSettings : ID³⁴²⁵
- Dichroic : ID³⁴²⁶
- Dichroic : Model³⁴²⁷
- Ellipse : FontSize³⁴²⁸
- Ellipse : ID³⁴²⁹
- Ellipse : RadiusX³⁴³⁰
- Ellipse : RadiusY³⁴³¹
- Ellipse : StrokeWidth³⁴³²
- Ellipse : TheT³⁴³³
- Ellipse : TheZ³⁴³⁴
- Ellipse : Transform³⁴³⁵
- Ellipse : X³⁴³⁶
- Ellipse : Y³⁴³⁷
- Filter : ID³⁴³⁸
- Filter : Model³⁴³⁹
- Image : AcquisitionDate³⁴⁴⁰
- Image : ID³⁴⁴¹
- Image : InstrumentRef³⁴⁴²
- Image : Name³⁴⁴³
- Image : ROIRef³⁴⁴⁴
- Instrument : ID³⁴⁴⁵
- Laser : ID³⁴⁴⁶
- Laser : LaserMedium³⁴⁴⁷

³⁴²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³⁴²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³⁴²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Voltage

³⁴²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³⁴²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

³⁴²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁴²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³⁴²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁴³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusX

³⁴³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusY

³⁴³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁴³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁴³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁴³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

³⁴³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_X

³⁴³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_Y

³⁴³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

³⁴³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁴⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁴⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁴⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³⁴⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁴⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

³⁴⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁴⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

³⁴⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

- Laser : Type³⁴⁴⁸
- Laser : Wavelength³⁴⁴⁹
- LightPath : DichroicRef³⁴⁵⁰
- LightPath : EmissionFilterRef³⁴⁵¹
- Line : FontSize³⁴⁵²
- Line : ID³⁴⁵³
- Line : StrokeWidth³⁴⁵⁴
- Line : TheT³⁴⁵⁵
- Line : TheZ³⁴⁵⁶
- Line : Transform³⁴⁵⁷
- Line : X1³⁴⁵⁸
- Line : X2³⁴⁵⁹
- Line : Y1³⁴⁶⁰
- Line : Y2³⁴⁶¹
- Objective : Correction³⁴⁶²
- Objective : ID³⁴⁶³
- Objective : Immersion³⁴⁶⁴
- Objective : LensNA³⁴⁶⁵
- Objective : Model³⁴⁶⁶
- Objective : NominalMagnification³⁴⁶⁷
- Objective : WorkingDistance³⁴⁶⁸
- ObjectiveSettings : ID³⁴⁶⁹
- Pixels : BigEndian³⁴⁷⁰
- Pixels : DimensionOrder³⁴⁷¹
- Pixels : ID³⁴⁷²
- Pixels : Interleaved³⁴⁷³

³⁴⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

³⁴⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

³⁴⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID

³⁴⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

³⁴⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³⁴⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁴⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁴⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁴⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁴⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

³⁴⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X1

³⁴⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X2

³⁴⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y1

³⁴⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y2

³⁴⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³⁴⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³⁴⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³⁴⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

³⁴⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁴⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

³⁴⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

³⁴⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³⁴⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁴⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁴⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁴⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

- Pixels : PhysicalSizeX³⁴⁷⁴
- Pixels : PhysicalSizeY³⁴⁷⁵
- Pixels : PhysicalSizeZ³⁴⁷⁶
- Pixels : SignificantBits³⁴⁷⁷
- Pixels : SizeC³⁴⁷⁸
- Pixels : SizeT³⁴⁷⁹
- Pixels : SizeX³⁴⁸⁰
- Pixels : SizeY³⁴⁸¹
- Pixels : SizeZ³⁴⁸²
- Pixels : TimeIncrement³⁴⁸³
- Pixels : Type³⁴⁸⁴
- Plane : DeltaT³⁴⁸⁵
- Plane : PositionX³⁴⁸⁶
- Plane : PositionY³⁴⁸⁷
- Plane : PositionZ³⁴⁸⁸
- Plane : TheC³⁴⁸⁹
- Plane : TheT³⁴⁹⁰
- Plane : TheZ³⁴⁹¹
- Point : FontSize³⁴⁹²
- Point : ID³⁴⁹³
- Point : StrokeWidth³⁴⁹⁴
- Point : TheT³⁴⁹⁵
- Point : TheZ³⁴⁹⁶
- Point : X³⁴⁹⁷
- Point : Y³⁴⁹⁸
- Polygon : FontSize³⁴⁹⁹

³⁴⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁴⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁴⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³⁴⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁴⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁴⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁴⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁴⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁴⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁴⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

³⁴⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁴⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³⁴⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁴⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³⁴⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³⁴⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁴⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁴⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

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#Point_X

³⁴⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Point_Y

³⁴⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

- Polygon : ID³⁵⁰⁰
- Polygon : Points³⁵⁰¹
- Polygon : StrokeWidth³⁵⁰²
- Polygon : TheT³⁵⁰³
- Polygon : TheZ³⁵⁰⁴
- Polygon : Transform³⁵⁰⁵
- Polyline : FontSize³⁵⁰⁶
- Polyline : ID³⁵⁰⁷
- Polyline : Points³⁵⁰⁸
- Polyline : StrokeWidth³⁵⁰⁹
- Polyline : TheT³⁵¹⁰
- Polyline : TheZ³⁵¹¹
- Polyline : Transform³⁵¹²
- ROI : ID³⁵¹³
- Rectangle : FontSize³⁵¹⁴
- Rectangle : Height³⁵¹⁵
- Rectangle : ID³⁵¹⁶
- Rectangle : StrokeWidth³⁵¹⁷
- Rectangle : TheT³⁵¹⁸
- Rectangle : TheZ³⁵¹⁹
- Rectangle : Transform³⁵²⁰
- Rectangle : Width³⁵²¹
- Rectangle : X³⁵²²
- Rectangle : Y³⁵²³
- TransmittanceRange : CutIn³⁵²⁴
- TransmittanceRange : CutOut³⁵²⁵

³⁵⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁵⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

³⁵⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁵⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁵⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁵⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

³⁵⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³⁵⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁵⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polyline_Points

³⁵⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁵¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁵¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁵¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

³⁵¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

³⁵¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

³⁵¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

³⁵¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

³⁵¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

³⁵¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheT

³⁵¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_TheZ

³⁵²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

³⁵²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

³⁵²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

³⁵²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

³⁵²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn

³⁵²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut

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 version³⁵²⁶ or the previous versions³⁵²⁷ page to find documentation for the version you are using.

18.2.91 FluoviewReader

This page lists supported metadata fields for the Bio-Formats Olympus Fluoview/ABD TIFF format reader.

These fields are from the OME data model³⁵²⁸. 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 : ID³⁵²⁹
- Channel : Name³⁵³⁰
- Channel : SamplesPerPixel³⁵³¹
- Detector : ID³⁵³²
- Detector : Manufacturer³⁵³³
- Detector : Model³⁵³⁴
- Detector : Type³⁵³⁵
- DetectorSettings : Gain³⁵³⁶
- DetectorSettings : ID³⁵³⁷
- DetectorSettings : Offset³⁵³⁸
- DetectorSettings : ReadOutRate³⁵³⁹
- DetectorSettings : Voltage³⁵⁴⁰
- Image : AcquisitionDate³⁵⁴¹
- Image : Description³⁵⁴²

³⁵²⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵²⁷<http://www.openmicroscopy.org/site/support/legacy/>

³⁵²⁸<http://www.openmicroscopy.org/site/support/ome-model/>

³⁵²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁵³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³⁵³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁵³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³⁵³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

³⁵³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁵³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³⁵³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

³⁵³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³⁵³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

³⁵³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ReadOutRate

³⁵⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Voltage

³⁵⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁵⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

- Image : ID³⁵⁴³
- Image : InstrumentRef³⁵⁴⁴
- Image : Name³⁵⁴⁵
- ImagingEnvironment : Temperature³⁵⁴⁶
- Instrument : ID³⁵⁴⁷
- Objective : CalibratedMagnification³⁵⁴⁸
- Objective : Correction³⁵⁴⁹
- Objective : ID³⁵⁵⁰
- Objective : Immersion³⁵⁵¹
- Objective : LensNA³⁵⁵²
- Objective : Model³⁵⁵³
- ObjectiveSettings : ID³⁵⁵⁴
- Pixels : BigEndian³⁵⁵⁵
- Pixels : DimensionOrder³⁵⁵⁶
- Pixels : ID³⁵⁵⁷
- Pixels : Interleaved³⁵⁵⁸
- Pixels : PhysicalSizeX³⁵⁵⁹
- Pixels : PhysicalSizeY³⁵⁶⁰
- Pixels : PhysicalSizeZ³⁵⁶¹
- Pixels : SignificantBits³⁵⁶²
- Pixels : SizeC³⁵⁶³
- Pixels : SizeT³⁵⁶⁴
- Pixels : SizeX³⁵⁶⁵
- Pixels : SizeY³⁵⁶⁶
- Pixels : SizeZ³⁵⁶⁷
- Pixels : TimeIncrement³⁵⁶⁸

³⁵⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁵⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³⁵⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁵⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

³⁵⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁵⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

³⁵⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³⁵⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³⁵⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³⁵⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

³⁵⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁵⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³⁵⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁵⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁵⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁵⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁵⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁵⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁵⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

³⁵⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁵⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁵⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁵⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁵⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁵⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁵⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

- Pixels : Type³⁵⁶⁹
- Plane : DeltaT³⁵⁷⁰
- Plane : ExposureTime³⁵⁷¹
- Plane : PositionX³⁵⁷²
- Plane : PositionY³⁵⁷³
- Plane : PositionZ³⁵⁷⁴
- Plane : TheC³⁵⁷⁵
- Plane : TheT³⁵⁷⁶
- Plane : TheZ³⁵⁷⁷

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 version³⁵⁷⁸](#) or the [previous versions³⁵⁷⁹](#) page to find documentation for the version you are using.

18.2.92 ScanRReader

This page lists supported metadata fields for the Bio-Formats Olympus ScanR format reader.

These fields are from the [OME data model³⁵⁸⁰](#). 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 : ID³⁵⁸¹
- Channel : Name³⁵⁸²
- Channel : SamplesPerPixel³⁵⁸³
- Image : AcquisitionDate³⁵⁸⁴
- Image : ID³⁵⁸⁵

³⁵⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁵⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³⁵⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁵⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁵⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³⁵⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³⁵⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁵⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁵⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁵⁷⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁵⁷⁹<http://www.openmicroscopy.org/site/support/legacy/>

³⁵⁸⁰<http://www.openmicroscopy.org/site/support/ome-model/>

³⁵⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁵⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³⁵⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁵⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁵⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name³⁵⁸⁶
- Pixels : BigEndian³⁵⁸⁷
- Pixels : DimensionOrder³⁵⁸⁸
- Pixels : ID³⁵⁸⁹
- Pixels : Interleaved³⁵⁹⁰
- Pixels : PhysicalSizeX³⁵⁹¹
- Pixels : PhysicalSizeY³⁵⁹²
- Pixels : SignificantBits³⁵⁹³
- Pixels : SizeC³⁵⁹⁴
- Pixels : SizeT³⁵⁹⁵
- Pixels : SizeX³⁵⁹⁶
- Pixels : SizeY³⁵⁹⁷
- Pixels : SizeZ³⁵⁹⁸
- Pixels : Type³⁵⁹⁹
- Plane : DeltaT³⁶⁰⁰
- Plane : ExposureTime³⁶⁰¹
- Plane : PositionX³⁶⁰²
- Plane : PositionY³⁶⁰³
- Plane : TheC³⁶⁰⁴
- Plane : TheT³⁶⁰⁵
- Plane : TheZ³⁶⁰⁶
- Plate : ColumnNamingConvention³⁶⁰⁷
- Plate : Columns³⁶⁰⁸
- Plate : ID³⁶⁰⁹
- Plate : Name³⁶¹⁰
- Plate : RowNamingConvention³⁶¹¹

³⁵⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁵⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁵⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁵⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁵⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁵⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁵⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁵⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁵⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁵⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁵⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁵⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁵⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁵⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁶⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³⁶⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁶⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁶⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³⁶⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁶⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁶⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁶⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ColumnNamingConvention

³⁶⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Columns

³⁶⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

³⁶¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

³⁶¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_RowNamingConvention

- Plate : Rows³⁶¹²
- PlateAcquisition : ID³⁶¹³
- PlateAcquisition : MaximumFieldCount³⁶¹⁴
- PlateAcquisition : WellSampleRef³⁶¹⁵
- Well : Column³⁶¹⁶
- Well : ID³⁶¹⁷
- Well : Row³⁶¹⁸
- WellSample : ID³⁶¹⁹
- WellSample : ImageRef³⁶²⁰
- WellSample : Index³⁶²¹
- WellSample : PositionX³⁶²²
- WellSample : PositionY³⁶²³

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 version³⁶²⁴ or the previous versions³⁶²⁵ page to find documentation for the version you are using.

18.2.93 SISReader

This page lists supported metadata fields for the Bio-Formats Olympus SIS TIFF format reader.

These fields are from the OME data model³⁶²⁶. 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 : ID³⁶²⁷
- Channel : Name³⁶²⁸

³⁶¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Rows

³⁶¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

³⁶¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

³⁶¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

³⁶¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

³⁶¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

³⁶¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

³⁶¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

³⁶²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

³⁶²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

³⁶²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionX

³⁶²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_PositionY

³⁶²⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁶²⁵<http://www.openmicroscopy.org/site/support/legacy/>

³⁶²⁶<http://www.openmicroscopy.org/site/support/ome-model/>

³⁶²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁶²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

- Channel : SamplesPerPixel³⁶²⁹
- Detector : ID³⁶³⁰
- Detector : Model³⁶³¹
- Detector : Type³⁶³²
- DetectorSettings : ID³⁶³³
- Image : AcquisitionDate³⁶³⁴
- Image : ID³⁶³⁵
- Image : InstrumentRef³⁶³⁶
- Image : Name³⁶³⁷
- Instrument : ID³⁶³⁸
- Objective : Correction³⁶³⁹
- Objective : ID³⁶⁴⁰
- Objective : Immersion³⁶⁴¹
- Objective : NominalMagnification³⁶⁴²
- ObjectiveSettings : ID³⁶⁴³
- Pixels : BigEndian³⁶⁴⁴
- Pixels : DimensionOrder³⁶⁴⁵
- Pixels : ID³⁶⁴⁶
- Pixels : Interleaved³⁶⁴⁷
- Pixels : PhysicalSizeX³⁶⁴⁸
- Pixels : PhysicalSizeY³⁶⁴⁹
- Pixels : SignificantBits³⁶⁵⁰
- Pixels : SizeC³⁶⁵¹
- Pixels : SizeT³⁶⁵²
- Pixels : SizeX³⁶⁵³
- Pixels : SizeY³⁶⁵⁴

³⁶²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁶³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³⁶³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

³⁶³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

³⁶³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³⁶³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁶³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁶³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³⁶³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁶³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁶³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

³⁶⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

³⁶⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

³⁶⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

³⁶⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

³⁶⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁶⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁶⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁶⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁶⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁶⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁶⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁶⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁶⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁶⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁶⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ³⁶⁵⁵
- Pixels : Type³⁶⁵⁶
- Plane : TheC³⁶⁵⁷
- Plane : TheT³⁶⁵⁸
- Plane : TheZ³⁶⁵⁹

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 version³⁶⁶⁰](#) or the [previous versions³⁶⁶¹](#) page to find documentation for the version you are using.

18.2.94 OMETiffReader

This page lists supported metadata fields for the Bio-Formats OME-TIFF format reader.

These fields are from the [OME data model³⁶⁶²](#). 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-TIFF format reader:

- Channel : ID³⁶⁶³
- Channel : SamplesPerPixel³⁶⁶⁴
- Image : AcquisitionDate³⁶⁶⁵
- Image : ID³⁶⁶⁶
- Image : Name³⁶⁶⁷
- Pixels : BigEndian³⁶⁶⁸
- Pixels : DimensionOrder³⁶⁶⁹
- Pixels : ID³⁶⁷⁰
- Pixels : Interleaved³⁶⁷¹

³⁶⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁶⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁶⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁶⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁶⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁶⁶⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁶⁶¹<http://www.openmicroscopy.org/site/support/legacy/>

³⁶⁶²<http://www.openmicroscopy.org/site/support/ome-model/>

³⁶⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁶⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁶⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁶⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁶⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁶⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁶⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁶⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁶⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

- Pixels : SignificantBits³⁶⁷²
- Pixels : SizeC³⁶⁷³
- Pixels : SizeT³⁶⁷⁴
- Pixels : SizeX³⁶⁷⁵
- Pixels : SizeY³⁶⁷⁶
- Pixels : SizeZ³⁶⁷⁷
- Pixels : Type³⁶⁷⁸
- Plane : TheC³⁶⁷⁹
- Plane : TheT³⁶⁸⁰
- Plane : TheZ³⁶⁸¹

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 version³⁶⁸² or the previous versions³⁶⁸³ page to find documentation for the version you are using.

18.2.95 OMEXMLReader

This page lists supported metadata fields for the Bio-Formats OME-XML format reader.

These fields are from the OME data model³⁶⁸⁴. 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 : ID³⁶⁸⁵
- Channel : SamplesPerPixel³⁶⁸⁶
- Image : AcquisitionDate³⁶⁸⁷
- Image : ID³⁶⁸⁸

³⁶⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁶⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁶⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁶⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁶⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁶⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁶⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁶⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁶⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁶⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁶⁸²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁶⁸³<http://www.openmicroscopy.org/site/support/legacy/>

³⁶⁸⁴<http://www.openmicroscopy.org/site/support/ome-model/>

³⁶⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁶⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁶⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁶⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name³⁶⁸⁹
- Pixels : BigEndian³⁶⁹⁰
- Pixels : DimensionOrder³⁶⁹¹
- Pixels : ID³⁶⁹²
- Pixels : Interleaved³⁶⁹³
- Pixels : SignificantBits³⁶⁹⁴
- Pixels : SizeC³⁶⁹⁵
- Pixels : SizeT³⁶⁹⁶
- Pixels : SizeX³⁶⁹⁷
- Pixels : SizeY³⁶⁹⁸
- Pixels : SizeZ³⁶⁹⁹
- Pixels : Type³⁷⁰⁰
- Plane : TheC³⁷⁰¹
- Plane : TheT³⁷⁰²
- Plane : TheZ³⁷⁰³

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 version³⁷⁰⁴ or the previous versions³⁷⁰⁵ page to find documentation for the version you are using.

18.2.96 OxfordInstrumentsReader

This page lists supported metadata fields for the Bio-Formats Oxford Instruments format reader.

These fields are from the OME data model³⁷⁰⁶. 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%).

³⁶⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁶⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁶⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁶⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁶⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁶⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁶⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁶⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁶⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁶⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁶⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁷⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁷⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁷⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁷⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁷⁰⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷⁰⁵<http://www.openmicroscopy.org/site/support/legacy/>

³⁷⁰⁶<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Oxford Instruments format reader:

- Channel : ID³⁷⁰⁷
- Channel : SamplesPerPixel³⁷⁰⁸
- Image : AcquisitionDate³⁷⁰⁹
- Image : Description³⁷¹⁰
- Image : ID³⁷¹¹
- Image : Name³⁷¹²
- Pixels : BigEndian³⁷¹³
- Pixels : DimensionOrder³⁷¹⁴
- Pixels : ID³⁷¹⁵
- Pixels : Interleaved³⁷¹⁶
- Pixels : PhysicalSizeX³⁷¹⁷
- Pixels : PhysicalSizeY³⁷¹⁸
- Pixels : SignificantBits³⁷¹⁹
- Pixels : SizeC³⁷²⁰
- Pixels : SizeT³⁷²¹
- Pixels : SizeX³⁷²²
- Pixels : SizeY³⁷²³
- Pixels : SizeZ³⁷²⁴
- Pixels : Type³⁷²⁵
- Plane : TheC³⁷²⁶
- Plane : TheT³⁷²⁷
- Plane : TheZ³⁷²⁸

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 version³⁷²⁹](#) or the [previous](#)

³⁷⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁷⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁷⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁷¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³⁷¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁷¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁷¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁷¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁷¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁷¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁷¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁷¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁷¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁷²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁷²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁷²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁷²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁷²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁷²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁷²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁷²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁷²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

versions³⁷³⁰ page to find documentation for the version you are using.

18.2.97 PCORAWReader

This page lists supported metadata fields for the Bio-Formats PCO-RAW format reader.

These fields are from the [OME data model](#)³⁷³¹. 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 : ID³⁷³²
- Channel : SamplesPerPixel³⁷³³
- Detector : ID³⁷³⁴
- Detector : SerialNumber³⁷³⁵
- DetectorSettings : Binning³⁷³⁶
- DetectorSettings : ID³⁷³⁷
- Image : AcquisitionDate³⁷³⁸
- Image : Description³⁷³⁹
- Image : ID³⁷⁴⁰
- Image : Name³⁷⁴¹
- Instrument : ID³⁷⁴²
- Pixels : BigEndian³⁷⁴³
- Pixels : DimensionOrder³⁷⁴⁴
- Pixels : ID³⁷⁴⁵
- Pixels : Interleaved³⁷⁴⁶
- Pixels : SignificantBits³⁷⁴⁷

³⁷²⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷³⁰<http://www.openmicroscopy.org/site/support/legacy/>

³⁷³¹<http://www.openmicroscopy.org/site/support/ome-model/>

³⁷³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁷³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁷³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

³⁷³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

³⁷³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

³⁷³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

³⁷³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁷³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

³⁷⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁷⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁷⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁷⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁷⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁷⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁷⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁷⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

- Pixels : SizeC³⁷⁴⁸
- Pixels : SizeT³⁷⁴⁹
- Pixels : SizeX³⁷⁵⁰
- Pixels : SizeY³⁷⁵¹
- Pixels : SizeZ³⁷⁵²
- Pixels : Type³⁷⁵³
- Plane : ExposureTime³⁷⁵⁴
- Plane : TheC³⁷⁵⁵
- Plane : TheT³⁷⁵⁶
- Plane : TheZ³⁷⁵⁷

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 version³⁷⁵⁸](#) or the [previous versions³⁷⁵⁹](#) page to find documentation for the version you are using.

18.2.98 PCXReader

This page lists supported metadata fields for the Bio-Formats PCX format reader.

These fields are from the [OME data model³⁷⁶⁰](#). 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 : ID³⁷⁶¹
- Channel : SamplesPerPixel³⁷⁶²
- Image : AcquisitionDate³⁷⁶³
- Image : ID³⁷⁶⁴

³⁷⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁷⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁷⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁷⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁷⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁷⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁷⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁷⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁷⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁷⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁷⁵⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷⁵⁹<http://www.openmicroscopy.org/site/support/legacy/>

³⁷⁶⁰<http://www.openmicroscopy.org/site/support/ome-model/>

³⁷⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁷⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁷⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁷⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name³⁷⁶⁵
- Pixels : BigEndian³⁷⁶⁶
- Pixels : DimensionOrder³⁷⁶⁷
- Pixels : ID³⁷⁶⁸
- Pixels : Interleaved³⁷⁶⁹
- Pixels : SignificantBits³⁷⁷⁰
- Pixels : SizeC³⁷⁷¹
- Pixels : SizeT³⁷⁷²
- Pixels : SizeX³⁷⁷³
- Pixels : SizeY³⁷⁷⁴
- Pixels : SizeZ³⁷⁷⁵
- Pixels : Type³⁷⁷⁶
- Plane : TheC³⁷⁷⁷
- Plane : TheT³⁷⁷⁸
- Plane : TheZ³⁷⁷⁹

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 version³⁷⁸⁰ or the previous versions³⁷⁸¹ page to find documentation for the version you are using.

18.2.99 PDSReader

This page lists supported metadata fields for the Bio-Formats Perkin Elmer Densitometer format reader.

These fields are from the OME data model³⁷⁸². 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%).

³⁷⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁷⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁷⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁷⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁷⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁷⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁷⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁷⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁷⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁷⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁷⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁷⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁷⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁷⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁷⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁷⁸⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁷⁸¹<http://www.openmicroscopy.org/site/support/legacy/>

³⁷⁸²<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Perkin Elmer Densitometer format reader:

- Channel : ID³⁷⁸³
- Channel : SamplesPerPixel³⁷⁸⁴
- Image : AcquisitionDate³⁷⁸⁵
- Image : ID³⁷⁸⁶
- Image : Name³⁷⁸⁷
- Pixels : BigEndian³⁷⁸⁸
- Pixels : DimensionOrder³⁷⁸⁹
- Pixels : ID³⁷⁹⁰
- Pixels : Interleaved³⁷⁹¹
- Pixels : PhysicalSizeX³⁷⁹²
- Pixels : PhysicalSizeY³⁷⁹³
- Pixels : SignificantBits³⁷⁹⁴
- Pixels : SizeC³⁷⁹⁵
- Pixels : SizeT³⁷⁹⁶
- Pixels : SizeX³⁷⁹⁷
- Pixels : SizeY³⁷⁹⁸
- Pixels : SizeZ³⁷⁹⁹
- Pixels : Type³⁸⁰⁰
- Plane : PositionX³⁸⁰¹
- Plane : PositionY³⁸⁰²
- Plane : TheC³⁸⁰³
- Plane : TheT³⁸⁰⁴
- Plane : TheZ³⁸⁰⁵

Total supported: 23

Total unknown or missing: 452

³⁷⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁷⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁷⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁷⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁷⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁷⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁷⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁷⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁷⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁷⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁷⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁷⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁷⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁷⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁷⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁷⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁷⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁸⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁸⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁸⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³⁸⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁸⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁸⁰⁵http://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 version³⁸⁰⁶](#) or the [previous versions³⁸⁰⁷](#) page to find documentation for the version you are using.

18.2.100 IM3Reader

This page lists supported metadata fields for the Bio-Formats Perkin-Elmer Nuance IM3 format reader.

These fields are from the [OME data model³⁸⁰⁸](#). 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 : ID³⁸⁰⁹
- Channel : SamplesPerPixel³⁸¹⁰
- Image : AcquisitionDate³⁸¹¹
- Image : ID³⁸¹²
- Image : Name³⁸¹³
- Pixels : BigEndian³⁸¹⁴
- Pixels : DimensionOrder³⁸¹⁵
- Pixels : ID³⁸¹⁶
- Pixels : Interleaved³⁸¹⁷
- Pixels : SignificantBits³⁸¹⁸
- Pixels : SizeC³⁸¹⁹
- Pixels : SizeT³⁸²⁰
- Pixels : SizeX³⁸²¹
- Pixels : SizeY³⁸²²
- Pixels : SizeZ³⁸²³
- Pixels : Type³⁸²⁴

³⁸⁰⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁸⁰⁷<http://www.openmicroscopy.org/site/support/legacy/>

³⁸⁰⁸<http://www.openmicroscopy.org/site/support/ome-model/>

³⁸⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁸¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁸¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁸¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁸¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁸¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁸¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁸¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁸¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁸¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁸¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁸²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁸²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁸²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁸²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁸²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC³⁸²⁵
- Plane : TheT³⁸²⁶
- Plane : TheZ³⁸²⁷

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 version³⁸²⁸](#) or the [previous versions³⁸²⁹](#) page to find documentation for the version you are using.

18.2.101 OperettaReader

This page lists supported metadata fields for the Bio-Formats PerkinElmer Operetta format reader.

These fields are from the [OME data model³⁸³⁰](#). 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 PerkinElmer Operetta format reader:

- Channel : ID³⁸³¹
- Channel : Name³⁸³²
- Channel : SamplesPerPixel³⁸³³
- Experimenter : ID³⁸³⁴
- Experimenter : LastName³⁸³⁵
- Image : AcquisitionDate³⁸³⁶
- Image : ExperimenterRef³⁸³⁷
- Image : ID³⁸³⁸
- Image : Name³⁸³⁹
- Pixels : BigEndian³⁸⁴⁰
- Pixels : DimensionOrder³⁸⁴¹

³⁸²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁸²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁸²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁸²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁸²⁹<http://www.openmicroscopy.org/site/support/legacy/>

³⁸³⁰<http://www.openmicroscopy.org/site/support/ome-model/>

³⁸³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁸³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

³⁸³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁸³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

³⁸³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

³⁸³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁸³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID

³⁸³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁸³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁸⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁸⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID³⁸⁴²
- Pixels : Interleaved³⁸⁴³
- Pixels : PhysicalSizeX³⁸⁴⁴
- Pixels : PhysicalSizeY³⁸⁴⁵
- Pixels : SignificantBits³⁸⁴⁶
- Pixels : SizeC³⁸⁴⁷
- Pixels : SizeT³⁸⁴⁸
- Pixels : SizeX³⁸⁴⁹
- Pixels : SizeY³⁸⁵⁰
- Pixels : SizeZ³⁸⁵¹
- Pixels : Type³⁸⁵²
- Plane : PositionX³⁸⁵³
- Plane : PositionY³⁸⁵⁴
- Plane : PositionZ³⁸⁵⁵
- Plane : TheC³⁸⁵⁶
- Plane : TheT³⁸⁵⁷
- Plane : TheZ³⁸⁵⁸
- Plate : Columns³⁸⁵⁹
- Plate : Description³⁸⁶⁰
- Plate : ExternalIdentifier³⁸⁶¹
- Plate : ID³⁸⁶²
- Plate : Name³⁸⁶³
- Plate : Rows³⁸⁶⁴
- PlateAcquisition : ID³⁸⁶⁵
- PlateAcquisition : MaximumFieldCount³⁸⁶⁶
- PlateAcquisition : WellSampleRef³⁸⁶⁷

³⁸⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁸⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁸⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁸⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁸⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁸⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁸⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁸⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁸⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁸⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁸⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁸⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁸⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³⁸⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³⁸⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁸⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁸⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁸⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Columns

³⁸⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Description

³⁸⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ExternalIdentifier

³⁸⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_ID

³⁸⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Name

³⁸⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Plate_Rows

³⁸⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_ID

³⁸⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#PlateAcquisition_MaximumFieldCount

³⁸⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSampleRef_ID

- Well : Column³⁸⁶⁸
- Well : ID³⁸⁶⁹
- Well : Row³⁸⁷⁰
- WellSample : ID³⁸⁷¹
- WellSample : ImageRef³⁸⁷²
- WellSample : Index³⁸⁷³

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 version³⁸⁷⁴ or the previous versions³⁸⁷⁵ page to find documentation for the version you are using.

18.2.102 PerkinElmerReader

This page lists supported metadata fields for the Bio-Formats PerkinElmer format reader.

These fields are from the OME data model³⁸⁷⁶. 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 : EmissionWavelength³⁸⁷⁷
- Channel : ExcitationWavelength³⁸⁷⁸
- Channel : ID³⁸⁷⁹
- Channel : SamplesPerPixel³⁸⁸⁰
- Image : AcquisitionDate³⁸⁸¹
- Image : ID³⁸⁸²
- Image : InstrumentRef³⁸⁸³
- Image : Name³⁸⁸⁴

³⁸⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Column

³⁸⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_ID

³⁸⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#Well_Row

³⁸⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_ID

³⁸⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImageRef_ID

³⁸⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/SPW_xsd.html#WellSample_Index

³⁸⁷⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁸⁷⁵<http://www.openmicroscopy.org/site/support/legacy/>

³⁸⁷⁶<http://www.openmicroscopy.org/site/support/ome-model/>

³⁸⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

³⁸⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

³⁸⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁸⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁸⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁸⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁸⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

³⁸⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

- Instrument : ID³⁸⁸⁵
- Pixels : BigEndian³⁸⁸⁶
- Pixels : DimensionOrder³⁸⁸⁷
- Pixels : ID³⁸⁸⁸
- Pixels : Interleaved³⁸⁸⁹
- Pixels : PhysicalSizeX³⁸⁹⁰
- Pixels : PhysicalSizeY³⁸⁹¹
- Pixels : SignificantBits³⁸⁹²
- Pixels : SizeC³⁸⁹³
- Pixels : SizeT³⁸⁹⁴
- Pixels : SizeX³⁸⁹⁵
- Pixels : SizeY³⁸⁹⁶
- Pixels : SizeZ³⁸⁹⁷
- Pixels : Type³⁸⁹⁸
- Plane : DeltaT³⁸⁹⁹
- Plane : ExposureTime³⁹⁰⁰
- Plane : PositionX³⁹⁰¹
- Plane : PositionY³⁹⁰²
- Plane : PositionZ³⁹⁰³
- Plane : TheC³⁹⁰⁴
- Plane : TheT³⁹⁰⁵
- Plane : TheZ³⁹⁰⁶

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 version³⁹⁰⁷ or the previous versions³⁹⁰⁸ page to find documentation for the version you are using.

³⁸⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

³⁸⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁸⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁸⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁸⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁸⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁸⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁸⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁸⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁸⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁸⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁸⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁸⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁸⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁸⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

³⁹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

³⁹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

³⁹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

³⁹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

³⁹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁹⁰⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹⁰⁸<http://www.openmicroscopy.org/site/support/legacy/>

18.2.103 PGMReader

This page lists supported metadata fields for the Bio-Formats Portable Any Map format reader.

These fields are from the [OME data model](#)³⁹⁰⁹. 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 : ID³⁹¹⁰
- Channel : SamplesPerPixel³⁹¹¹
- Image : AcquisitionDate³⁹¹²
- Image : ID³⁹¹³
- Image : Name³⁹¹⁴
- Pixels : BigEndian³⁹¹⁵
- Pixels : DimensionOrder³⁹¹⁶
- Pixels : ID³⁹¹⁷
- Pixels : Interleaved³⁹¹⁸
- Pixels : SignificantBits³⁹¹⁹
- Pixels : SizeC³⁹²⁰
- Pixels : SizeT³⁹²¹
- Pixels : SizeX³⁹²²
- Pixels : SizeY³⁹²³
- Pixels : SizeZ³⁹²⁴
- Pixels : Type³⁹²⁵
- Plane : TheC³⁹²⁶
- Plane : TheT³⁹²⁷

³⁹⁰⁹<http://www.openmicroscopy.org/site/support/ome-model/>

³⁹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ³⁹²⁸

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 version³⁹²⁹ or the previous versions³⁹³⁰ page to find documentation for the version you are using.

18.2.104 PSDReader

This page lists supported metadata fields for the Bio-Formats Adobe Photoshop format reader.

These fields are from the OME data model³⁹³¹. 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 format reader:

- Channel : ID³⁹³²
- Channel : SamplesPerPixel³⁹³³
- Image : AcquisitionDate³⁹³⁴
- Image : ID³⁹³⁵
- Image : Name³⁹³⁶
- Pixels : BigEndian³⁹³⁷
- Pixels : DimensionOrder³⁹³⁸
- Pixels : ID³⁹³⁹
- Pixels : Interleaved³⁹⁴⁰
- Pixels : SignificantBits³⁹⁴¹
- Pixels : SizeC³⁹⁴²
- Pixels : SizeT³⁹⁴³
- Pixels : SizeX³⁹⁴⁴

³⁹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁹²⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹³⁰<http://www.openmicroscopy.org/site/support/legacy/>

³⁹³¹<http://www.openmicroscopy.org/site/support/ome-model/>

³⁹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

- Pixels : SizeY³⁹⁴⁵
- Pixels : SizeZ³⁹⁴⁶
- Pixels : Type³⁹⁴⁷
- Plane : TheC³⁹⁴⁸
- Plane : TheT³⁹⁴⁹
- Plane : TheZ³⁹⁵⁰

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 version³⁹⁵¹ or the previous versions³⁹⁵² page to find documentation for the version you are using.

18.2.105 PhotoshopTiffReader

This page lists supported metadata fields for the Bio-Formats Adobe Photoshop TIFF format reader.

These fields are from the OME data model³⁹⁵³. 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 : ID³⁹⁵⁴
- Channel : SamplesPerPixel³⁹⁵⁵
- Image : AcquisitionDate³⁹⁵⁶
- Image : ID³⁹⁵⁷
- Image : Name³⁹⁵⁸
- Pixels : BigEndian³⁹⁵⁹
- Pixels : DimensionOrder³⁹⁶⁰
- Pixels : ID³⁹⁶¹

³⁹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁹⁵¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹⁵²<http://www.openmicroscopy.org/site/support/legacy/>

³⁹⁵³<http://www.openmicroscopy.org/site/support/ome-model/>

³⁹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

³⁹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

- Pixels : Interleaved³⁹⁶²
- Pixels : SignificantBits³⁹⁶³
- Pixels : SizeC³⁹⁶⁴
- Pixels : SizeT³⁹⁶⁵
- Pixels : SizeX³⁹⁶⁶
- Pixels : SizeY³⁹⁶⁷
- Pixels : SizeZ³⁹⁶⁸
- Pixels : Type³⁹⁶⁹
- Plane : TheC³⁹⁷⁰
- Plane : TheT³⁹⁷¹
- Plane : TheZ³⁹⁷²

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 version³⁹⁷³](#) or the [previous versions³⁹⁷⁴](#) page to find documentation for the version you are using.

18.2.106 PQBinReader

This page lists supported metadata fields for the Bio-Formats PicoQuant Bin format reader.

These fields are from the [OME data model³⁹⁷⁵](#). 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 : ID³⁹⁷⁶
- Channel : SamplesPerPixel³⁹⁷⁷
- Image : AcquisitionDate³⁹⁷⁸

³⁹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁹⁷³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹⁷⁴<http://www.openmicroscopy.org/site/support/legacy/>

³⁹⁷⁵<http://www.openmicroscopy.org/site/support/ome-model/>

³⁹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

³⁹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

³⁹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID³⁹⁷⁹
- Image : Name³⁹⁸⁰
- Pixels : BigEndian³⁹⁸¹
- Pixels : DimensionOrder³⁹⁸²
- Pixels : ID³⁹⁸³
- Pixels : Interleaved³⁹⁸⁴
- Pixels : PhysicalSizeX³⁹⁸⁵
- Pixels : PhysicalSizeY³⁹⁸⁶
- Pixels : SignificantBits³⁹⁸⁷
- Pixels : SizeC³⁹⁸⁸
- Pixels : SizeT³⁹⁸⁹
- Pixels : SizeX³⁹⁹⁰
- Pixels : SizeY³⁹⁹¹
- Pixels : SizeZ³⁹⁹²
- Pixels : Type³⁹⁹³
- Plane : TheC³⁹⁹⁴
- Plane : TheT³⁹⁹⁵
- Plane : TheZ³⁹⁹⁶

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 version³⁹⁹⁷ or the previous versions³⁹⁹⁸ page to find documentation for the version you are using.

18.2.107 PictReader

This page lists supported metadata fields for the Bio-Formats PICT format reader.

These fields are from the OME data model³⁹⁹⁹. 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*:

³⁹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

³⁹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

³⁹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

³⁹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

³⁹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

³⁹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

³⁹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

³⁹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

³⁹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

³⁹⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

³⁹⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

³⁹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

³⁹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

³⁹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

³⁹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

³⁹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

³⁹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

³⁹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

³⁹⁹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

³⁹⁹⁸<http://www.openmicroscopy.org/site/support/legacy/>

³⁹⁹⁹<http://www.openmicroscopy.org/site/support/ome-model/>

- 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 : ID⁴⁰⁰⁰
- Channel : SamplesPerPixel⁴⁰⁰¹
- Image : AcquisitionDate⁴⁰⁰²
- Image : ID⁴⁰⁰³
- Image : Name⁴⁰⁰⁴
- Pixels : BigEndian⁴⁰⁰⁵
- Pixels : DimensionOrder⁴⁰⁰⁶
- Pixels : ID⁴⁰⁰⁷
- Pixels : Interleaved⁴⁰⁰⁸
- Pixels : SignificantBits⁴⁰⁰⁹
- Pixels : SizeC⁴⁰¹⁰
- Pixels : SizeT⁴⁰¹¹
- Pixels : SizeX⁴⁰¹²
- Pixels : SizeY⁴⁰¹³
- Pixels : SizeZ⁴⁰¹⁴
- Pixels : Type⁴⁰¹⁵
- Plane : TheC⁴⁰¹⁶
- Plane : TheT⁴⁰¹⁷
- Plane : TheZ⁴⁰¹⁸

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 version⁴⁰¹⁹ or the previous versions⁴⁰²⁰ page to find documentation for the version you are using.

⁴⁰⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁰⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁰⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁰⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁰⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁰⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁰⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁰⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁰⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁰⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁰¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁰¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁰¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁰¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁰¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁰¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁰¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁰¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁰¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁰¹⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰²⁰<http://www.openmicroscopy.org/site/support/legacy/>

18.2.108 APNGReader

This page lists supported metadata fields for the Bio-Formats Animated PNG format reader.

These fields are from the [OME data model](#)⁴⁰²¹. 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 : ID⁴⁰²²
- Channel : SamplesPerPixel⁴⁰²³
- Image : AcquisitionDate⁴⁰²⁴
- Image : ID⁴⁰²⁵
- Image : Name⁴⁰²⁶
- Pixels : BigEndian⁴⁰²⁷
- Pixels : DimensionOrder⁴⁰²⁸
- Pixels : ID⁴⁰²⁹
- Pixels : Interleaved⁴⁰³⁰
- Pixels : SignificantBits⁴⁰³¹
- Pixels : SizeC⁴⁰³²
- Pixels : SizeT⁴⁰³³
- Pixels : SizeX⁴⁰³⁴
- Pixels : SizeY⁴⁰³⁵
- Pixels : SizeZ⁴⁰³⁶
- Pixels : Type⁴⁰³⁷
- Plane : TheC⁴⁰³⁸
- Plane : TheT⁴⁰³⁹

⁴⁰²¹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁰²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁰²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁰²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁰²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁰²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁰²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁰²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁰²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁰³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁰³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁰³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁰³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁰³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁰³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁰³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁰³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁰³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁰³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ⁴⁰⁴⁰

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 version⁴⁰⁴¹](#) or the [previous versions⁴⁰⁴²](#) page to find documentation for the version you are using.

18.2.109 PrairieReader

This page lists supported metadata fields for the Bio-Formats Prairie TIFF format reader.

These fields are from the [OME data model⁴⁰⁴³](#). 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 Prairie TIFF format reader:

- Channel : EmissionWavelength⁴⁰⁴⁴
- Channel : ID⁴⁰⁴⁵
- Channel : Name⁴⁰⁴⁶
- Channel : SamplesPerPixel⁴⁰⁴⁷
- Detector : ID⁴⁰⁴⁸
- Detector : Type⁴⁰⁴⁹
- Detector : Zoom⁴⁰⁵⁰
- DetectorSettings : Gain⁴⁰⁵¹
- DetectorSettings : ID⁴⁰⁵²
- DetectorSettings : Offset⁴⁰⁵³
- Image : AcquisitionDate⁴⁰⁵⁴
- Image : ID⁴⁰⁵⁵
- Image : InstrumentRef⁴⁰⁵⁶

⁴⁰⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁰⁴¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰⁴²<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰⁴³<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁰⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁴⁰⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁰⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁴⁰⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁰⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴⁰⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁴⁰⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Zoom

⁴⁰⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁴⁰⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁴⁰⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Offset

⁴⁰⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁰⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁰⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

- Image : Name⁴⁰⁵⁷
- Instrument : ID⁴⁰⁵⁸
- Laser : ID⁴⁰⁵⁹
- Laser : Power⁴⁰⁶⁰
- Microscope : Model⁴⁰⁶¹
- Objective : Correction⁴⁰⁶²
- Objective : ID⁴⁰⁶³
- Objective : Immersion⁴⁰⁶⁴
- Objective : LensNA⁴⁰⁶⁵
- Objective : Manufacturer⁴⁰⁶⁶
- Objective : NominalMagnification⁴⁰⁶⁷
- ObjectiveSettings : ID⁴⁰⁶⁸
- Pixels : BigEndian⁴⁰⁶⁹
- Pixels : DimensionOrder⁴⁰⁷⁰
- Pixels : ID⁴⁰⁷¹
- Pixels : Interleaved⁴⁰⁷²
- Pixels : PhysicalSizeX⁴⁰⁷³
- Pixels : PhysicalSizeY⁴⁰⁷⁴
- Pixels : SignificantBits⁴⁰⁷⁵
- Pixels : SizeC⁴⁰⁷⁶
- Pixels : SizeT⁴⁰⁷⁷
- Pixels : SizeX⁴⁰⁷⁸
- Pixels : SizeY⁴⁰⁷⁹
- Pixels : SizeZ⁴⁰⁸⁰
- Pixels : TimeIncrement⁴⁰⁸¹
- Pixels : Type⁴⁰⁸²

⁴⁰⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁰⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴⁰⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

⁴⁰⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁴⁰⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁰⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁴⁰⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴⁰⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁴⁰⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

⁴⁰⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁰⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁴⁰⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁴⁰⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁰⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁰⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁰⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁰⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁰⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁰⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁰⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁰⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁰⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁰⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁰⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁰⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

⁴⁰⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : DeltaT⁴⁰⁸³
- Plane : PositionX⁴⁰⁸⁴
- Plane : PositionY⁴⁰⁸⁵
- Plane : PositionZ⁴⁰⁸⁶
- Plane : TheC⁴⁰⁸⁷
- Plane : TheT⁴⁰⁸⁸
- Plane : TheZ⁴⁰⁸⁹

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 version⁴⁰⁹⁰](#) or the [previous versions⁴⁰⁹¹](#) page to find documentation for the version you are using.

18.2.110 QuesantReader

This page lists supported metadata fields for the Bio-Formats Quesant AFM format reader.

These fields are from the [OME data model⁴⁰⁹²](#). 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 : ID⁴⁰⁹³
- Channel : SamplesPerPixel⁴⁰⁹⁴
- Image : AcquisitionDate⁴⁰⁹⁵
- Image : Description⁴⁰⁹⁶
- Image : ID⁴⁰⁹⁷
- Image : Name⁴⁰⁹⁸
- Pixels : BigEndian⁴⁰⁹⁹

⁴⁰⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁴⁰⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

⁴⁰⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

⁴⁰⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

⁴⁰⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁰⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁰⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁰⁹⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁰⁹¹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁰⁹²<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁰⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁰⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁰⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁰⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁰⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁰⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁰⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

- Pixels : DimensionOrder⁴¹⁰⁰
- Pixels : ID⁴¹⁰¹
- Pixels : Interleaved⁴¹⁰²
- Pixels : PhysicalSizeX⁴¹⁰³
- Pixels : PhysicalSizeY⁴¹⁰⁴
- Pixels : SignificantBits⁴¹⁰⁵
- Pixels : SizeC⁴¹⁰⁶
- Pixels : SizeT⁴¹⁰⁷
- Pixels : SizeX⁴¹⁰⁸
- Pixels : SizeY⁴¹⁰⁹
- Pixels : SizeZ⁴¹¹⁰
- Pixels : Type⁴¹¹¹
- Plane : TheC⁴¹¹²
- Plane : TheT⁴¹¹³
- Plane : TheZ⁴¹¹⁴

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 version⁴¹¹⁵ or the previous versions⁴¹¹⁶ page to find documentation for the version you are using.

18.2.111 NativeQTReader

This page lists supported metadata fields for the Bio-Formats QuickTime format reader.

These fields are from the OME data model⁴¹¹⁷. 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%).

⁴¹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴¹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴¹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴¹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴¹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴¹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴¹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴¹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴¹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴¹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴¹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴¹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴¹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴¹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴¹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴¹¹⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴¹¹⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁴¹¹⁷<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats QuickTime format reader:

- Channel : ID⁴¹¹⁸
- Channel : SamplesPerPixel⁴¹¹⁹
- Image : AcquisitionDate⁴¹²⁰
- Image : ID⁴¹²¹
- Image : Name⁴¹²²
- Pixels : BigEndian⁴¹²³
- Pixels : DimensionOrder⁴¹²⁴
- Pixels : ID⁴¹²⁵
- Pixels : Interleaved⁴¹²⁶
- Pixels : SignificantBits⁴¹²⁷
- Pixels : SizeC⁴¹²⁸
- Pixels : SizeT⁴¹²⁹
- Pixels : SizeX⁴¹³⁰
- Pixels : SizeY⁴¹³¹
- Pixels : SizeZ⁴¹³²
- Pixels : Type⁴¹³³
- Plane : TheC⁴¹³⁴
- Plane : TheT⁴¹³⁵
- Plane : TheZ⁴¹³⁶

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 version⁴¹³⁷ or the previous versions⁴¹³⁸ page to find documentation for the version you are using.

⁴¹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴¹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴¹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴¹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴¹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴¹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴¹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴¹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴¹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴¹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴¹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴¹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴¹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴¹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴¹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴¹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴¹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴¹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴¹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴¹³⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴¹³⁸<http://www.openmicroscopy.org/site/support/legacy/>

18.2.112 RHKReader

This page lists supported metadata fields for the Bio-Formats RHK Technologies format reader.

These fields are from the [OME data model](#)⁴¹³⁹. 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 : ID⁴¹⁴⁰
- Channel : SamplesPerPixel⁴¹⁴¹
- Image : AcquisitionDate⁴¹⁴²
- Image : Description⁴¹⁴³
- Image : ID⁴¹⁴⁴
- Image : Name⁴¹⁴⁵
- Pixels : BigEndian⁴¹⁴⁶
- Pixels : DimensionOrder⁴¹⁴⁷
- Pixels : ID⁴¹⁴⁸
- Pixels : Interleaved⁴¹⁴⁹
- Pixels : PhysicalSizeX⁴¹⁵⁰
- Pixels : PhysicalSizeY⁴¹⁵¹
- Pixels : SignificantBits⁴¹⁵²
- Pixels : SizeC⁴¹⁵³
- Pixels : SizeT⁴¹⁵⁴
- Pixels : SizeX⁴¹⁵⁵
- Pixels : SizeY⁴¹⁵⁶
- Pixels : SizeZ⁴¹⁵⁷
- Pixels : Type⁴¹⁵⁸

⁴¹³⁹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴¹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴¹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴¹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴¹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴¹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴¹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴¹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴¹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴¹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴¹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴¹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴¹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴¹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴¹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴¹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴¹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴¹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴¹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴¹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

- Plane : TheC⁴¹⁵⁹
- Plane : TheT⁴¹⁶⁰
- Plane : TheZ⁴¹⁶¹

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 version⁴¹⁶²](#) or the [previous versions⁴¹⁶³](#) page to find documentation for the version you are using.

18.2.113 SBIGReader

This page lists supported metadata fields for the Bio-Formats SBIG format reader.

These fields are from the [OME data model⁴¹⁶⁴](#). 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 SBIG format reader:

- Channel : ID⁴¹⁶⁵
- Channel : SamplesPerPixel⁴¹⁶⁶
- Image : AcquisitionDate⁴¹⁶⁷
- Image : Description⁴¹⁶⁸
- Image : ID⁴¹⁶⁹
- Image : Name⁴¹⁷⁰
- Pixels : BigEndian⁴¹⁷¹
- Pixels : DimensionOrder⁴¹⁷²
- Pixels : ID⁴¹⁷³
- Pixels : Interleaved⁴¹⁷⁴
- Pixels : PhysicalSizeX⁴¹⁷⁵

⁴¹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴¹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴¹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴¹⁶²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴¹⁶³<http://www.openmicroscopy.org/site/support/legacy/>

⁴¹⁶⁴<http://www.openmicroscopy.org/site/support/ome-model/>

⁴¹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴¹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴¹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴¹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴¹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴¹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴¹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴¹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴¹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴¹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴¹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

- Pixels : PhysicalSizeY⁴¹⁷⁶
- Pixels : SignificantBits⁴¹⁷⁷
- Pixels : SizeC⁴¹⁷⁸
- Pixels : SizeT⁴¹⁷⁹
- Pixels : SizeX⁴¹⁸⁰
- Pixels : SizeY⁴¹⁸¹
- Pixels : SizeZ⁴¹⁸²
- Pixels : Type⁴¹⁸³
- Plane : TheC⁴¹⁸⁴
- Plane : TheT⁴¹⁸⁵
- Plane : TheZ⁴¹⁸⁶

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 version⁴¹⁸⁷](#) or the [previous versions⁴¹⁸⁸](#) page to find documentation for the version you are using.

18.2.114 SeikoReader

This page lists supported metadata fields for the Bio-Formats Seiko format reader.

These fields are from the [OME data model⁴¹⁸⁹](#). 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 : ID⁴¹⁹⁰
- Channel : SamplesPerPixel⁴¹⁹¹
- Image : AcquisitionDate⁴¹⁹²

⁴¹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴¹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴¹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴¹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴¹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴¹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴¹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴¹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴¹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴¹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴¹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴¹⁸⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴¹⁸⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴¹⁸⁹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴¹⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴¹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴¹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : Description⁴¹⁹³
- Image : ID⁴¹⁹⁴
- Image : Name⁴¹⁹⁵
- Pixels : BigEndian⁴¹⁹⁶
- Pixels : DimensionOrder⁴¹⁹⁷
- Pixels : ID⁴¹⁹⁸
- Pixels : Interleaved⁴¹⁹⁹
- Pixels : PhysicalSizeX⁴²⁰⁰
- Pixels : PhysicalSizeY⁴²⁰¹
- Pixels : SignificantBits⁴²⁰²
- Pixels : SizeC⁴²⁰³
- Pixels : SizeT⁴²⁰⁴
- Pixels : SizeX⁴²⁰⁵
- Pixels : SizeY⁴²⁰⁶
- Pixels : SizeZ⁴²⁰⁷
- Pixels : Type⁴²⁰⁸
- Plane : TheC⁴²⁰⁹
- Plane : TheT⁴²¹⁰
- Plane : TheZ⁴²¹¹

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 version⁴²¹² or the previous versions⁴²¹³ page to find documentation for the version you are using.

18.2.115 PCIReader

This page lists supported metadata fields for the Bio-Formats Compix Simple-PCI format reader.

- ⁴¹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description
- ⁴¹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ⁴¹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ⁴¹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ⁴¹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ⁴¹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁴¹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁴²⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ⁴²⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ⁴²⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁴²⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁴²⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁴²⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁴²⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁴²⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁴²⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁴²⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁴²¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁴²¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁴²¹²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁴²¹³<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)⁴²¹⁴. 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 : ID⁴²¹⁵
- Channel : SamplesPerPixel⁴²¹⁶
- Detector : ID⁴²¹⁷
- Detector : Type⁴²¹⁸
- DetectorSettings : Binning⁴²¹⁹
- DetectorSettings : ID⁴²²⁰
- Image : AcquisitionDate⁴²²¹
- Image : ID⁴²²²
- Image : InstrumentRef⁴²²³
- Image : Name⁴²²⁴
- Instrument : ID⁴²²⁵
- Pixels : BigEndian⁴²²⁶
- Pixels : DimensionOrder⁴²²⁷
- Pixels : ID⁴²²⁸
- Pixels : Interleaved⁴²²⁹
- Pixels : PhysicalSizeX⁴²³⁰
- Pixels : PhysicalSizeY⁴²³¹
- Pixels : SignificantBits⁴²³²
- Pixels : SizeC⁴²³³
- Pixels : SizeT⁴²³⁴

⁴²¹⁴<http://www.openmicroscopy.org/site/support/ome-model/>

⁴²¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴²¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴²¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴²¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁴²¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁴²²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁴²²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴²²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴²²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁴²²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴²²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴²²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴²²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴²²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴²²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴²³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴²³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴²³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴²³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴²³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

- Pixels : SizeX⁴²³⁵
- Pixels : SizeY⁴²³⁶
- Pixels : SizeZ⁴²³⁷
- Pixels : TimeIncrement⁴²³⁸
- Pixels : Type⁴²³⁹
- Plane : DeltaT⁴²⁴⁰
- Plane : TheC⁴²⁴¹
- Plane : TheT⁴²⁴²
- Plane : TheZ⁴²⁴³

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 version⁴²⁴⁴](#) or the [previous versions⁴²⁴⁵](#) page to find documentation for the version you are using.

18.2.116 SimplePCITiffReader

This page lists supported metadata fields for the Bio-Formats SimplePCI TIFF format reader.

These fields are from the [OME data model⁴²⁴⁶](#). 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 : ID⁴²⁴⁷
- Channel : SamplesPerPixel⁴²⁴⁸
- Detector : ID⁴²⁴⁹
- Detector : Model⁴²⁵⁰
- Detector : Type⁴²⁵¹

⁴²³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴²³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴²³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴²³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

⁴²³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴²⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁴²⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴²⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴²⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴²⁴⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴²⁴⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁴²⁴⁶<http://www.openmicroscopy.org/site/support/ome-model/>

⁴²⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴²⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴²⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴²⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴²⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

- DetectorSettings : Binning⁴²⁵²
- DetectorSettings : ID⁴²⁵³
- Image : AcquisitionDate⁴²⁵⁴
- Image : Description⁴²⁵⁵
- Image : ID⁴²⁵⁶
- Image : InstrumentRef⁴²⁵⁷
- Image : Name⁴²⁵⁸
- Instrument : ID⁴²⁵⁹
- Objective : ID⁴²⁶⁰
- Objective : Immersion⁴²⁶¹
- Objective : NominalMagnification⁴²⁶²
- Pixels : BigEndian⁴²⁶³
- Pixels : DimensionOrder⁴²⁶⁴
- Pixels : ID⁴²⁶⁵
- Pixels : Interleaved⁴²⁶⁶
- Pixels : PhysicalSizeX⁴²⁶⁷
- Pixels : PhysicalSizeY⁴²⁶⁸
- Pixels : SignificantBits⁴²⁶⁹
- Pixels : SizeC⁴²⁷⁰
- Pixels : SizeT⁴²⁷¹
- Pixels : SizeX⁴²⁷²
- Pixels : SizeY⁴²⁷³
- Pixels : SizeZ⁴²⁷⁴
- Pixels : Type⁴²⁷⁵
- Plane : ExposureTime⁴²⁷⁶
- Plane : TheC⁴²⁷⁷

⁴²⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁴²⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁴²⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴²⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴²⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴²⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁴²⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴²⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴²⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴²⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁴²⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁴²⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴²⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴²⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴²⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴²⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴²⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴²⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴²⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴²⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴²⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴²⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴²⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴²⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴²⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

⁴²⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

- Plane : TheT⁴²⁷⁸
- Plane : TheZ⁴²⁷⁹

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 version⁴²⁸⁰ or the previous versions⁴²⁸¹ page to find documentation for the version you are using.

18.2.117 SMCameraReader

This page lists supported metadata fields for the Bio-Formats SM Camera format reader.

These fields are from the OME data model⁴²⁸². 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 SM Camera format reader:

- Channel : ID⁴²⁸³
- Channel : SamplesPerPixel⁴²⁸⁴
- Image : AcquisitionDate⁴²⁸⁵
- Image : ID⁴²⁸⁶
- Image : Name⁴²⁸⁷
- Pixels : BigEndian⁴²⁸⁸
- Pixels : DimensionOrder⁴²⁸⁹
- Pixels : ID⁴²⁹⁰
- Pixels : Interleaved⁴²⁹¹
- Pixels : SignificantBits⁴²⁹²
- Pixels : SizeC⁴²⁹³
- Pixels : SizeT⁴²⁹⁴

⁴²⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴²⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴²⁸⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴²⁸¹<http://www.openmicroscopy.org/site/support/legacy/>

⁴²⁸²<http://www.openmicroscopy.org/site/support/ome-model/>

⁴²⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴²⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴²⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴²⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴²⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴²⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴²⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴²⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴²⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴²⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴²⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴²⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

- Pixels : SizeX⁴²⁹⁵
- Pixels : SizeY⁴²⁹⁶
- Pixels : SizeZ⁴²⁹⁷
- Pixels : Type⁴²⁹⁸
- Plane : TheC⁴²⁹⁹
- Plane : TheT⁴³⁰⁰
- Plane : TheZ⁴³⁰¹

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 version⁴³⁰²](#) or the [previous versions⁴³⁰³](#) page to find documentation for the version you are using.

18.2.118 SpiderReader

This page lists supported metadata fields for the Bio-Formats SPIDER format reader.

These fields are from the [OME data model⁴³⁰⁴](#). 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 : ID⁴³⁰⁵
- Channel : SamplesPerPixel⁴³⁰⁶
- Image : AcquisitionDate⁴³⁰⁷
- Image : ID⁴³⁰⁸
- Image : Name⁴³⁰⁹
- Pixels : BigEndian⁴³¹⁰
- Pixels : DimensionOrder⁴³¹¹

⁴²⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴²⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴²⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴²⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴²⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴³⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴³⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴³⁰²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³⁰³<http://www.openmicroscopy.org/site/support/legacy/>

⁴³⁰⁴<http://www.openmicroscopy.org/site/support/ome-model/>

⁴³⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴³⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴³⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴³⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴³⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴³¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴³¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID⁴³¹²
- Pixels : Interleaved⁴³¹³
- Pixels : PhysicalSizeX⁴³¹⁴
- Pixels : PhysicalSizeY⁴³¹⁵
- Pixels : SignificantBits⁴³¹⁶
- Pixels : SizeC⁴³¹⁷
- Pixels : SizeT⁴³¹⁸
- Pixels : SizeX⁴³¹⁹
- Pixels : SizeY⁴³²⁰
- Pixels : SizeZ⁴³²¹
- Pixels : Type⁴³²²
- Plane : TheC⁴³²³
- Plane : TheT⁴³²⁴
- Plane : TheZ⁴³²⁵

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 version⁴³²⁶ or the previous versions⁴³²⁷ page to find documentation for the version you are using.

18.2.119 TargaReader

This page lists supported metadata fields for the Bio-Formats Truevision Targa format reader.

These fields are from the OME data model⁴³²⁸. 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:

- ⁴³¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁴³¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁴³¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ⁴³¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ⁴³¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁴³¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁴³¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁴³¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁴³²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁴³²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁴³²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁴³²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁴³²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁴³²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁴³²⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁴³²⁷<http://www.openmicroscopy.org/site/support/legacy/>
- ⁴³²⁸<http://www.openmicroscopy.org/site/support/ome-model/>

- Channel : ID⁴³²⁹
- Channel : SamplesPerPixel⁴³³⁰
- Image : AcquisitionDate⁴³³¹
- Image : Description⁴³³²
- Image : ID⁴³³³
- Image : Name⁴³³⁴
- Pixels : BigEndian⁴³³⁵
- Pixels : DimensionOrder⁴³³⁶
- Pixels : ID⁴³³⁷
- Pixels : Interleaved⁴³³⁸
- Pixels : SignificantBits⁴³³⁹
- Pixels : SizeC⁴³⁴⁰
- Pixels : SizeT⁴³⁴¹
- Pixels : SizeX⁴³⁴²
- Pixels : SizeY⁴³⁴³
- Pixels : SizeZ⁴³⁴⁴
- Pixels : Type⁴³⁴⁵
- Plane : TheC⁴³⁴⁶
- Plane : TheT⁴³⁴⁷
- Plane : TheZ⁴³⁴⁸

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 version⁴³⁴⁹ or the previous versions⁴³⁵⁰ page to find documentation for the version you are using.

18.2.120 TextReader

This page lists supported metadata fields for the Bio-Formats Text format reader.

- ⁴³²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID
- ⁴³³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel
- ⁴³³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate
- ⁴³³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description
- ⁴³³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ⁴³³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ⁴³³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ⁴³³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ⁴³³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁴³³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁴³³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁴³⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁴³⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁴³⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁴³⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁴³⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁴³⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁴³⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁴³⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁴³⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁴³⁴⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁴³⁵⁰<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)⁴³⁵¹. 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 : ID⁴³⁵²
- Channel : SamplesPerPixel⁴³⁵³
- Image : AcquisitionDate⁴³⁵⁴
- Image : ID⁴³⁵⁵
- Image : Name⁴³⁵⁶
- Pixels : BigEndian⁴³⁵⁷
- Pixels : DimensionOrder⁴³⁵⁸
- Pixels : ID⁴³⁵⁹
- Pixels : Interleaved⁴³⁶⁰
- Pixels : SignificantBits⁴³⁶¹
- Pixels : SizeC⁴³⁶²
- Pixels : SizeT⁴³⁶³
- Pixels : SizeX⁴³⁶⁴
- Pixels : SizeY⁴³⁶⁵
- Pixels : SizeZ⁴³⁶⁶
- Pixels : Type⁴³⁶⁷
- Plane : TheC⁴³⁶⁸
- Plane : TheT⁴³⁶⁹
- Plane : TheZ⁴³⁷⁰

⁴³⁵¹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴³⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴³⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴³⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴³⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴³⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴³⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴³⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴³⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴³⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴³⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴³⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴³⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴³⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴³⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴³⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴³⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴³⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴³⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴³⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

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 version⁴³⁷¹](#) or the [previous versions⁴³⁷²](#) page to find documentation for the version you are using.

18.2.121 TiffReader

This page lists supported metadata fields for the Bio-Formats Tagged Image File Format format reader.

These fields are from the [OME data model⁴³⁷³](#). 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:

- Channel : ID⁴³⁷⁴
- Channel : SamplesPerPixel⁴³⁷⁵
- Image : AcquisitionDate⁴³⁷⁶
- Image : Description⁴³⁷⁷
- Image : ID⁴³⁷⁸
- Image : Name⁴³⁷⁹
- Pixels : BigEndian⁴³⁸⁰
- Pixels : DimensionOrder⁴³⁸¹
- Pixels : ID⁴³⁸²
- Pixels : Interleaved⁴³⁸³
- Pixels : PhysicalSizeZ⁴³⁸⁴
- Pixels : SignificantBits⁴³⁸⁵
- Pixels : SizeC⁴³⁸⁶
- Pixels : SizeT⁴³⁸⁷

⁴³⁷¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³⁷²<http://www.openmicroscopy.org/site/support/legacy/>

⁴³⁷³<http://www.openmicroscopy.org/site/support/ome-model/>

⁴³⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴³⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴³⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴³⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴³⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴³⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴³⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴³⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴³⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴³⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴³⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁴³⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴³⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴³⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

- Pixels : SizeX⁴³⁸⁸
- Pixels : SizeY⁴³⁸⁹
- Pixels : SizeZ⁴³⁹⁰
- Pixels : TimeIncrement⁴³⁹¹
- Pixels : Type⁴³⁹²
- Plane : TheC⁴³⁹³
- Plane : TheT⁴³⁹⁴
- Plane : TheZ⁴³⁹⁵

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 version⁴³⁹⁶ or the previous versions⁴³⁹⁷ page to find documentation for the version you are using.

18.2.122 TillVisionReader

This page lists supported metadata fields for the Bio-Formats TillVision format reader.

These fields are from the OME data model⁴³⁹⁸. 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 : ID⁴³⁹⁹
- Channel : SamplesPerPixel⁴⁴⁰⁰
- Experiment : ID⁴⁴⁰¹
- Experiment : Type⁴⁴⁰²
- Image : AcquisitionDate⁴⁴⁰³
- Image : ID⁴⁴⁰⁴

⁴³⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴³⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴³⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴³⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

⁴³⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴³⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴³⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴³⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴³⁹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴³⁹⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴³⁹⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁴³⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁴⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁴⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_ID

⁴⁴⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experiment_Type

⁴⁴⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁴⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name⁴⁴⁰⁵
- Pixels : BigEndian⁴⁴⁰⁶
- Pixels : DimensionOrder⁴⁴⁰⁷
- Pixels : ID⁴⁴⁰⁸
- Pixels : Interleaved⁴⁴⁰⁹
- Pixels : SignificantBits⁴⁴¹⁰
- Pixels : SizeC⁴⁴¹¹
- Pixels : SizeT⁴⁴¹²
- Pixels : SizeX⁴⁴¹³
- Pixels : SizeY⁴⁴¹⁴
- Pixels : SizeZ⁴⁴¹⁵
- Pixels : Type⁴⁴¹⁶
- Plane : ExposureTime⁴⁴¹⁷
- Plane : TheC⁴⁴¹⁸
- Plane : TheT⁴⁴¹⁹
- Plane : TheZ⁴⁴²⁰

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 version⁴⁴²¹ or the previous versions⁴⁴²² page to find documentation for the version you are using.

18.2.123 TopometrixReader

This page lists supported metadata fields for the Bio-Formats TopoMetrix format reader.

These fields are from the OME data model⁴⁴²³. 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%).

⁴⁴⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁴⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁴⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁴⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁴⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁴¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁴¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁴¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁴¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁴¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁴¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁴¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁴¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

⁴⁴¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁴¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁴²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁴²¹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴²²<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁴²³<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats TopoMetrix format reader:

- Channel : ID⁴⁴²⁴
- Channel : SamplesPerPixel⁴⁴²⁵
- Image : AcquisitionDate⁴⁴²⁶
- Image : Description⁴⁴²⁷
- Image : ID⁴⁴²⁸
- Image : Name⁴⁴²⁹
- Pixels : BigEndian⁴⁴³⁰
- Pixels : DimensionOrder⁴⁴³¹
- Pixels : ID⁴⁴³²
- Pixels : Interleaved⁴⁴³³
- Pixels : PhysicalSizeX⁴⁴³⁴
- Pixels : PhysicalSizeY⁴⁴³⁵
- Pixels : SignificantBits⁴⁴³⁶
- Pixels : SizeC⁴⁴³⁷
- Pixels : SizeT⁴⁴³⁸
- Pixels : SizeX⁴⁴³⁹
- Pixels : SizeY⁴⁴⁴⁰
- Pixels : SizeZ⁴⁴⁴¹
- Pixels : Type⁴⁴⁴²
- Plane : TheC⁴⁴⁴³
- Plane : TheT⁴⁴⁴⁴
- Plane : TheZ⁴⁴⁴⁵

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 version⁴⁴⁴⁶](#) or the [previous](#)

- ⁴⁴²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID
- ⁴⁴²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel
- ⁴⁴²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate
- ⁴⁴²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description
- ⁴⁴²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ⁴⁴²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ⁴⁴³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ⁴⁴³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ⁴⁴³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁴⁴³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁴⁴³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ⁴⁴³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ⁴⁴³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁴⁴³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁴⁴³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁴⁴³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁴⁴⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁴⁴⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁴⁴⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁴⁴⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁴⁴⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁴⁴⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

versions⁴⁴⁴⁷ page to find documentation for the version you are using.

18.2.124 TrestleReader

This page lists supported metadata fields for the Bio-Formats Trestle format reader.

These fields are from the [OME data model](#)⁴⁴⁴⁸. 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 : ID⁴⁴⁴⁹
- Channel : SamplesPerPixel⁴⁴⁵⁰
- Image : AcquisitionDate⁴⁴⁵¹
- Image : ID⁴⁴⁵²
- Image : Name⁴⁴⁵³
- Image : ROIRef⁴⁴⁵⁴
- Mask : Height⁴⁴⁵⁵
- Mask : ID⁴⁴⁵⁶
- Mask : Width⁴⁴⁵⁷
- Mask : X⁴⁴⁵⁸
- Mask : Y⁴⁴⁵⁹
- Pixels : BigEndian⁴⁴⁶⁰
- Pixels : DimensionOrder⁴⁴⁶¹
- Pixels : ID⁴⁴⁶²
- Pixels : Interleaved⁴⁴⁶³
- Pixels : SignificantBits⁴⁴⁶⁴

⁴⁴⁴⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴⁴⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁴⁴⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁴⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁴⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁴⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁴⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁴⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁴⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

⁴⁴⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Height

⁴⁴⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁴⁴⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Width

⁴⁴⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_X

⁴⁴⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Mask_Y

⁴⁴⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁴⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁴⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁴⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁴⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

- Pixels : SizeC⁴⁴⁶⁵
- Pixels : SizeT⁴⁴⁶⁶
- Pixels : SizeX⁴⁴⁶⁷
- Pixels : SizeY⁴⁴⁶⁸
- Pixels : SizeZ⁴⁴⁶⁹
- Pixels : Type⁴⁴⁷⁰
- Plane : TheC⁴⁴⁷¹
- Plane : TheT⁴⁴⁷²
- Plane : TheZ⁴⁴⁷³
- ROI : ID⁴⁴⁷⁴

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 version⁴⁴⁷⁵](#) or the [previous versions⁴⁴⁷⁶](#) page to find documentation for the version you are using.

18.2.125 UBMReader

This page lists supported metadata fields for the Bio-Formats UBM format reader.

These fields are from the [OME data model⁴⁴⁷⁷](#). 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 : ID⁴⁴⁷⁸
- Channel : SamplesPerPixel⁴⁴⁷⁹
- Image : AcquisitionDate⁴⁴⁸⁰
- Image : ID⁴⁴⁸¹

⁴⁴⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁴⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁴⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁴⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁴⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁴⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁴⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁴⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁴⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁴⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

⁴⁴⁷⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴⁷⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁴⁷⁷<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁴⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁴⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁴⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁴⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : Name⁴⁴⁸²
- Pixels : BigEndian⁴⁴⁸³
- Pixels : DimensionOrder⁴⁴⁸⁴
- Pixels : ID⁴⁴⁸⁵
- Pixels : Interleaved⁴⁴⁸⁶
- Pixels : SignificantBits⁴⁴⁸⁷
- Pixels : SizeC⁴⁴⁸⁸
- Pixels : SizeT⁴⁴⁸⁹
- Pixels : SizeX⁴⁴⁹⁰
- Pixels : SizeY⁴⁴⁹¹
- Pixels : SizeZ⁴⁴⁹²
- Pixels : Type⁴⁴⁹³
- Plane : TheC⁴⁴⁹⁴
- Plane : TheT⁴⁴⁹⁵
- Plane : TheZ⁴⁴⁹⁶

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 version⁴⁴⁹⁷ or the previous versions⁴⁴⁹⁸ page to find documentation for the version you are using.

18.2.126 UnisokuReader

This page lists supported metadata fields for the Bio-Formats Unisoku STM format reader.

These fields are from the OME data model⁴⁴⁹⁹. 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%).

⁴⁴⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁴⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁴⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁴⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁴⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁴⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁴⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁴⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁴⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁴⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁴⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁴⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁴⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁴⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁴⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁴⁹⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁴⁹⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁴⁹⁹<http://www.openmicroscopy.org/site/support/ome-model/>

Supported fields

These fields are fully supported by the Bio-Formats Unisoku STM format reader:

- Channel : ID⁴⁵⁰⁰
- Channel : SamplesPerPixel⁴⁵⁰¹
- Image : AcquisitionDate⁴⁵⁰²
- Image : Description⁴⁵⁰³
- Image : ID⁴⁵⁰⁴
- Image : Name⁴⁵⁰⁵
- Pixels : BigEndian⁴⁵⁰⁶
- Pixels : DimensionOrder⁴⁵⁰⁷
- Pixels : ID⁴⁵⁰⁸
- Pixels : Interleaved⁴⁵⁰⁹
- Pixels : PhysicalSizeX⁴⁵¹⁰
- Pixels : PhysicalSizeY⁴⁵¹¹
- Pixels : SignificantBits⁴⁵¹²
- Pixels : SizeC⁴⁵¹³
- Pixels : SizeT⁴⁵¹⁴
- Pixels : SizeX⁴⁵¹⁵
- Pixels : SizeY⁴⁵¹⁶
- Pixels : SizeZ⁴⁵¹⁷
- Pixels : Type⁴⁵¹⁸
- Plane : TheC⁴⁵¹⁹
- Plane : TheT⁴⁵²⁰
- Plane : TheZ⁴⁵²¹

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 version⁴⁵²²](#) or the [previous](#)

⁴⁵⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁵⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁵⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁵⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁵⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁵⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁵⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁵⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁵⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁵⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁵¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁵¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁵¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁵¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁵¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁵¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁵¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁵¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁵¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁵¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁵²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁵²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

versions⁴⁵²³ page to find documentation for the version you are using.

18.2.127 VarianFDFReader

This page lists supported metadata fields for the Bio-Formats Varian FDF format reader.

These fields are from the [OME data model](#)⁴⁵²⁴. 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 : ID⁴⁵²⁵
- Channel : SamplesPerPixel⁴⁵²⁶
- Image : AcquisitionDate⁴⁵²⁷
- Image : ID⁴⁵²⁸
- Image : Name⁴⁵²⁹
- Pixels : BigEndian⁴⁵³⁰
- Pixels : DimensionOrder⁴⁵³¹
- Pixels : ID⁴⁵³²
- Pixels : Interleaved⁴⁵³³
- Pixels : PhysicalSizeX⁴⁵³⁴
- Pixels : PhysicalSizeY⁴⁵³⁵
- Pixels : PhysicalSizeZ⁴⁵³⁶
- Pixels : SignificantBits⁴⁵³⁷
- Pixels : SizeC⁴⁵³⁸
- Pixels : SizeT⁴⁵³⁹
- Pixels : SizeX⁴⁵⁴⁰

⁴⁵²²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁵²³<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁵²⁴<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁵²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁵²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁵²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁵²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁵²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁵³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁵³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁵³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁵³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁵³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁵³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁵³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁴⁵³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁵³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁵³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁵⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

- Pixels : SizeY⁴⁵⁴¹
- Pixels : SizeZ⁴⁵⁴²
- Pixels : Type⁴⁵⁴³
- Plane : PositionX⁴⁵⁴⁴
- Plane : PositionY⁴⁵⁴⁵
- Plane : PositionZ⁴⁵⁴⁶
- Plane : TheC⁴⁵⁴⁷
- Plane : TheT⁴⁵⁴⁸
- Plane : TheZ⁴⁵⁴⁹

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 version⁴⁵⁵⁰](#) or the [previous versions⁴⁵⁵¹](#) page to find documentation for the version you are using.

18.2.128 VeecoReader

This page lists supported metadata fields for the Bio-Formats Veeco format reader.

These fields are from the [OME data model⁴⁵⁵²](#). 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 : ID⁴⁵⁵³
- Channel : SamplesPerPixel⁴⁵⁵⁴
- Image : AcquisitionDate⁴⁵⁵⁵
- Image : ID⁴⁵⁵⁶
- Image : Name⁴⁵⁵⁷

⁴⁵⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁵⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁵⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁵⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

⁴⁵⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

⁴⁵⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

⁴⁵⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁵⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁵⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁵⁵⁰<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁵⁵¹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁵⁵²<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁵⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁵⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁵⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁵⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁵⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

- Pixels : BigEndian⁴⁵⁵⁸
- Pixels : DimensionOrder⁴⁵⁵⁹
- Pixels : ID⁴⁵⁶⁰
- Pixels : Interleaved⁴⁵⁶¹
- Pixels : SignificantBits⁴⁵⁶²
- Pixels : SizeC⁴⁵⁶³
- Pixels : SizeT⁴⁵⁶⁴
- Pixels : SizeX⁴⁵⁶⁵
- Pixels : SizeY⁴⁵⁶⁶
- Pixels : SizeZ⁴⁵⁶⁷
- Pixels : Type⁴⁵⁶⁸
- Plane : TheC⁴⁵⁶⁹
- Plane : TheT⁴⁵⁷⁰
- Plane : TheZ⁴⁵⁷¹

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 version⁴⁵⁷² or the previous versions⁴⁵⁷³ page to find documentation for the version you are using.

18.2.129 VGSAMReader

This page lists supported metadata fields for the Bio-Formats VG SAM format reader.

These fields are from the OME data model⁴⁵⁷⁴. 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:

- ⁴⁵⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ⁴⁵⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ⁴⁵⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁴⁵⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁴⁵⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁴⁵⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁴⁵⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁴⁵⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁴⁵⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁴⁵⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁴⁵⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁴⁵⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁴⁵⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁴⁵⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁴⁵⁷²<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁴⁵⁷³<http://www.openmicroscopy.org/site/support/legacy/>
- ⁴⁵⁷⁴<http://www.openmicroscopy.org/site/support/ome-model/>

- Channel : ID⁴⁵⁷⁵
- Channel : SamplesPerPixel⁴⁵⁷⁶
- Image : AcquisitionDate⁴⁵⁷⁷
- Image : ID⁴⁵⁷⁸
- Image : Name⁴⁵⁷⁹
- Pixels : BigEndian⁴⁵⁸⁰
- Pixels : DimensionOrder⁴⁵⁸¹
- Pixels : ID⁴⁵⁸²
- Pixels : Interleaved⁴⁵⁸³
- Pixels : SignificantBits⁴⁵⁸⁴
- Pixels : SizeC⁴⁵⁸⁵
- Pixels : SizeT⁴⁵⁸⁶
- Pixels : SizeX⁴⁵⁸⁷
- Pixels : SizeY⁴⁵⁸⁸
- Pixels : SizeZ⁴⁵⁸⁹
- Pixels : Type⁴⁵⁹⁰
- Plane : TheC⁴⁵⁹¹
- Plane : TheT⁴⁵⁹²
- Plane : TheZ⁴⁵⁹³

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 version⁴⁵⁹⁴ or the previous versions⁴⁵⁹⁵ page to find documentation for the version you are using.

18.2.130 VisitechReader

This page lists supported metadata fields for the Bio-Formats Visitech XYS format reader.

- ⁴⁵⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID
- ⁴⁵⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel
- ⁴⁵⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate
- ⁴⁵⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ⁴⁵⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ⁴⁵⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ⁴⁵⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ⁴⁵⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁴⁵⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁴⁵⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁴⁵⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁴⁵⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁴⁵⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁴⁵⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁴⁵⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁴⁵⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁴⁵⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁴⁵⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁴⁵⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁴⁵⁹⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁴⁵⁹⁵<http://www.openmicroscopy.org/site/support/legacy/>

These fields are from the [OME data model](#)⁴⁵⁹⁶. 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 : ID⁴⁵⁹⁷
- Channel : SamplesPerPixel⁴⁵⁹⁸
- Image : AcquisitionDate⁴⁵⁹⁹
- Image : ID⁴⁶⁰⁰
- Image : Name⁴⁶⁰¹
- Pixels : BigEndian⁴⁶⁰²
- Pixels : DimensionOrder⁴⁶⁰³
- Pixels : ID⁴⁶⁰⁴
- Pixels : Interleaved⁴⁶⁰⁵
- Pixels : SignificantBits⁴⁶⁰⁶
- Pixels : SizeC⁴⁶⁰⁷
- Pixels : SizeT⁴⁶⁰⁸
- Pixels : SizeX⁴⁶⁰⁹
- Pixels : SizeY⁴⁶¹⁰
- Pixels : SizeZ⁴⁶¹¹
- Pixels : Type⁴⁶¹²
- Plane : TheC⁴⁶¹³
- Plane : TheT⁴⁶¹⁴
- Plane : TheZ⁴⁶¹⁵

⁴⁵⁹⁶<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁵⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁵⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁵⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁶⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁶⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁶⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁶⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁶⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁶⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁶⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁶⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁶⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁶⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁶¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁶¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁶¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁶¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁶¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁶¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

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 version⁴⁶¹⁶](#) or the [previous versions⁴⁶¹⁷](#) page to find documentation for the version you are using.

18.2.131 VelocityClippingReader

This page lists supported metadata fields for the Bio-Formats Velocity Library Clipping format reader.

These fields are from the [OME data model⁴⁶¹⁸](#). 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 Velocity Library Clipping format reader:

- Channel : ID⁴⁶¹⁹
- Channel : SamplesPerPixel⁴⁶²⁰
- Image : AcquisitionDate⁴⁶²¹
- Image : ID⁴⁶²²
- Image : Name⁴⁶²³
- Pixels : BigEndian⁴⁶²⁴
- Pixels : DimensionOrder⁴⁶²⁵
- Pixels : ID⁴⁶²⁶
- Pixels : Interleaved⁴⁶²⁷
- Pixels : SignificantBits⁴⁶²⁸
- Pixels : SizeC⁴⁶²⁹
- Pixels : SizeT⁴⁶³⁰
- Pixels : SizeX⁴⁶³¹
- Pixels : SizeY⁴⁶³²

⁴⁶¹⁶<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁶¹⁷<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁶¹⁸<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁶¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁶²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁶²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁶²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁶²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁶²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁶²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁶²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁶²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁶²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁶²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁶³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁶³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁶³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

- Pixels : SizeZ⁴⁶³³
- Pixels : Type⁴⁶³⁴
- Plane : TheC⁴⁶³⁵
- Plane : TheT⁴⁶³⁶
- Plane : TheZ⁴⁶³⁷

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 version⁴⁶³⁸](#) or the [previous versions⁴⁶³⁹](#) page to find documentation for the version you are using.

18.2.132 VolocityReader

This page lists supported metadata fields for the Bio-Formats Volocity Library format reader.

These fields are from the [OME data model⁴⁶⁴⁰](#). 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 Volocity Library format reader:

- Channel : ID⁴⁶⁴¹
- Channel : Name⁴⁶⁴²
- Channel : SamplesPerPixel⁴⁶⁴³
- Detector : ID⁴⁶⁴⁴
- Detector : Model⁴⁶⁴⁵
- DetectorSettings : ID⁴⁶⁴⁶
- Image : AcquisitionDate⁴⁶⁴⁷
- Image : Description⁴⁶⁴⁸
- Image : ID⁴⁶⁴⁹

⁴⁶³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁶³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁶³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁶³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁶³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁶³⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁶³⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁶⁴⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁶⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁶⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁴⁶⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁶⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴⁶⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁶⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁴⁶⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁶⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁶⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : InstrumentRef⁴⁶⁵⁰
- Image : Name⁴⁶⁵¹
- Instrument : ID⁴⁶⁵²
- Objective : Correction⁴⁶⁵³
- Objective : ID⁴⁶⁵⁴
- Objective : Immersion⁴⁶⁵⁵
- Objective : NominalMagnification⁴⁶⁵⁶
- ObjectiveSettings : ID⁴⁶⁵⁷
- Pixels : BigEndian⁴⁶⁵⁸
- Pixels : DimensionOrder⁴⁶⁵⁹
- Pixels : ID⁴⁶⁶⁰
- Pixels : Interleaved⁴⁶⁶¹
- Pixels : PhysicalSizeX⁴⁶⁶²
- Pixels : PhysicalSizeY⁴⁶⁶³
- Pixels : PhysicalSizeZ⁴⁶⁶⁴
- Pixels : SignificantBits⁴⁶⁶⁵
- Pixels : SizeC⁴⁶⁶⁶
- Pixels : SizeT⁴⁶⁶⁷
- Pixels : SizeX⁴⁶⁶⁸
- Pixels : SizeY⁴⁶⁶⁹
- Pixels : SizeZ⁴⁶⁷⁰
- Pixels : Type⁴⁶⁷¹
- Plane : DeltaT⁴⁶⁷²
- Plane : PositionX⁴⁶⁷³
- Plane : PositionY⁴⁶⁷⁴
- Plane : PositionZ⁴⁶⁷⁵

⁴⁶⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁴⁶⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁶⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴⁶⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁴⁶⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴⁶⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁴⁶⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁴⁶⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁴⁶⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁶⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁶⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁶⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁶⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁶⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁶⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁴⁶⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁶⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁶⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁶⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁶⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁶⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁶⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁶⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁴⁶⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

⁴⁶⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

⁴⁶⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

- Plane : TheC⁴⁶⁷⁶
- Plane : TheT⁴⁶⁷⁷
- Plane : TheZ⁴⁶⁷⁸

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 version⁴⁶⁷⁹](#) or the [previous versions⁴⁶⁸⁰](#) page to find documentation for the version you are using.

18.2.133 WATOPReader

This page lists supported metadata fields for the Bio-Formats WA Technology TOP format reader.

These fields are from the [OME data model⁴⁶⁸¹](#). 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:

- Channel : ID⁴⁶⁸²
- Channel : SamplesPerPixel⁴⁶⁸³
- Image : AcquisitionDate⁴⁶⁸⁴
- Image : Description⁴⁶⁸⁵
- Image : ID⁴⁶⁸⁶
- Image : Name⁴⁶⁸⁷
- Pixels : BigEndian⁴⁶⁸⁸
- Pixels : DimensionOrder⁴⁶⁸⁹
- Pixels : ID⁴⁶⁹⁰
- Pixels : Interleaved⁴⁶⁹¹
- Pixels : PhysicalSizeX⁴⁶⁹²

⁴⁶⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁶⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁶⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁶⁷⁹<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁶⁸⁰<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁶⁸¹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁶⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

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#Image_AcquisitionDate

⁴⁶⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁶⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁶⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁶⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁶⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁶⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁶⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁶⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

- Pixels : PhysicalSizeY⁴⁶⁹³
- Pixels : SignificantBits⁴⁶⁹⁴
- Pixels : SizeC⁴⁶⁹⁵
- Pixels : SizeT⁴⁶⁹⁶
- Pixels : SizeX⁴⁶⁹⁷
- Pixels : SizeY⁴⁶⁹⁸
- Pixels : SizeZ⁴⁶⁹⁹
- Pixels : Type⁴⁷⁰⁰
- Plane : TheC⁴⁷⁰¹
- Plane : TheT⁴⁷⁰²
- Plane : TheZ⁴⁷⁰³

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 version⁴⁷⁰⁴](#) or the [previous versions⁴⁷⁰⁵](#) page to find documentation for the version you are using.

18.2.134 BMPReader

This page lists supported metadata fields for the Bio-Formats Windows Bitmap format reader.

These fields are from the [OME data model⁴⁷⁰⁶](#). 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 : ID⁴⁷⁰⁷
- Channel : SamplesPerPixel⁴⁷⁰⁸
- Image : AcquisitionDate⁴⁷⁰⁹

⁴⁶⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁶⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁶⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁶⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁶⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁶⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁶⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁷⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁷⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁷⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁷⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁷⁰⁴<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷⁰⁵<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁷⁰⁶<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁷⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁷⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁷⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

- Image : ID⁴⁷¹⁰
- Image : Name⁴⁷¹¹
- Pixels : BigEndian⁴⁷¹²
- Pixels : DimensionOrder⁴⁷¹³
- Pixels : ID⁴⁷¹⁴
- Pixels : Interleaved⁴⁷¹⁵
- Pixels : PhysicalSizeX⁴⁷¹⁶
- Pixels : PhysicalSizeY⁴⁷¹⁷
- Pixels : SignificantBits⁴⁷¹⁸
- Pixels : SizeC⁴⁷¹⁹
- Pixels : SizeT⁴⁷²⁰
- Pixels : SizeX⁴⁷²¹
- Pixels : SizeY⁴⁷²²
- Pixels : SizeZ⁴⁷²³
- Pixels : Type⁴⁷²⁴
- Plane : TheC⁴⁷²⁵
- Plane : TheT⁴⁷²⁶
- Plane : TheZ⁴⁷²⁷

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 version⁴⁷²⁸ or the previous versions⁴⁷²⁹ page to find documentation for the version you are using.

18.2.135 WlZReader

This page lists supported metadata fields for the Bio-Formats Woolz format reader.

These fields are from the OME data model⁴⁷³⁰. 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*:

- ⁴⁷¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID
- ⁴⁷¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name
- ⁴⁷¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian
- ⁴⁷¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder
- ⁴⁷¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID
- ⁴⁷¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved
- ⁴⁷¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX
- ⁴⁷¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY
- ⁴⁷¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits
- ⁴⁷¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC
- ⁴⁷²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT
- ⁴⁷²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX
- ⁴⁷²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY
- ⁴⁷²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ
- ⁴⁷²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type
- ⁴⁷²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC
- ⁴⁷²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT
- ⁴⁷²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ
- ⁴⁷²⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>
- ⁴⁷²⁹<http://www.openmicroscopy.org/site/support/legacy/>
- ⁴⁷³⁰<http://www.openmicroscopy.org/site/support/ome-model/>

- 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 : ID⁴⁷³¹
- Channel : SamplesPerPixel⁴⁷³²
- Image : AcquisitionDate⁴⁷³³
- Image : ID⁴⁷³⁴
- Image : Name⁴⁷³⁵
- Pixels : BigEndian⁴⁷³⁶
- Pixels : DimensionOrder⁴⁷³⁷
- Pixels : ID⁴⁷³⁸
- Pixels : Interleaved⁴⁷³⁹
- Pixels : PhysicalSizeX⁴⁷⁴⁰
- Pixels : PhysicalSizeY⁴⁷⁴¹
- Pixels : PhysicalSizeZ⁴⁷⁴²
- Pixels : SignificantBits⁴⁷⁴³
- Pixels : SizeC⁴⁷⁴⁴
- Pixels : SizeT⁴⁷⁴⁵
- Pixels : SizeX⁴⁷⁴⁶
- Pixels : SizeY⁴⁷⁴⁷
- Pixels : SizeZ⁴⁷⁴⁸
- Pixels : Type⁴⁷⁴⁹
- Plane : TheC⁴⁷⁵⁰
- Plane : TheT⁴⁷⁵¹
- Plane : TheZ⁴⁷⁵²
- StageLabel : Name⁴⁷⁵³

⁴⁷³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁷³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁷³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁷³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁷³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁷³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁷³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁷³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁷³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁷⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁷⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁴⁷⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁴⁷⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁷⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁷⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁷⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁷⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁷⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁷⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁷⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁷⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁷⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁷⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Name

- StageLabel : X⁴⁷⁵⁴
- StageLabel : Y⁴⁷⁵⁵
- StageLabel : Z⁴⁷⁵⁶

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 version⁴⁷⁵⁷](#) or the [previous versions⁴⁷⁵⁸](#) page to find documentation for the version you are using.

18.2.136 ZeissLMSReader

This page lists supported metadata fields for the Bio-Formats Zeiss LMS format reader.

These fields are from the [OME data model⁴⁷⁵⁹](#). 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 Zeiss LMS format reader:

- Channel : ID⁴⁷⁶⁰
- Channel : SamplesPerPixel⁴⁷⁶¹
- Image : AcquisitionDate⁴⁷⁶²
- Image : ID⁴⁷⁶³
- Image : Name⁴⁷⁶⁴
- Instrument : ID⁴⁷⁶⁵
- Objective : ID⁴⁷⁶⁶
- Objective : NominalMagnification⁴⁷⁶⁷
- ObjectiveSettings : ID⁴⁷⁶⁸
- Pixels : BigEndian⁴⁷⁶⁹
- Pixels : DimensionOrder⁴⁷⁷⁰

⁴⁷⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_X

⁴⁷⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Y

⁴⁷⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#StageLabel_Z

⁴⁷⁵⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷⁵⁸<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁷⁵⁹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁷⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁷⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁷⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁷⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁷⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁷⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴⁷⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴⁷⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁴⁷⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁴⁷⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁷⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

- Pixels : ID⁴⁷⁷¹
- Pixels : Interleaved⁴⁷⁷²
- Pixels : SignificantBits⁴⁷⁷³
- Pixels : SizeC⁴⁷⁷⁴
- Pixels : SizeT⁴⁷⁷⁵
- Pixels : SizeX⁴⁷⁷⁶
- Pixels : SizeY⁴⁷⁷⁷
- Pixels : SizeZ⁴⁷⁷⁸
- Pixels : Type⁴⁷⁷⁹
- Plane : TheC⁴⁷⁸⁰
- Plane : TheT⁴⁷⁸¹
- Plane : TheZ⁴⁷⁸²

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 version⁴⁷⁸³ or the previous versions⁴⁷⁸⁴ page to find documentation for the version you are using.

18.2.137 ZeissTIFFReader

This page lists supported metadata fields for the Bio-Formats Zeiss AxioVision TIFF format reader.

These fields are from the OME data model⁴⁷⁸⁵. 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 : ID⁴⁷⁸⁶
- Channel : SamplesPerPixel⁴⁷⁸⁷

⁴⁷⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁷⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁷⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁷⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁷⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁷⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁷⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁷⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁷⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁷⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁷⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁷⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁷⁸³<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁷⁸⁴<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁷⁸⁵<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁷⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁷⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

- Image : AcquisitionDate⁴⁷⁸⁸
- Image : ID⁴⁷⁸⁹
- Image : Name⁴⁷⁹⁰
- Pixels : BigEndian⁴⁷⁹¹
- Pixels : DimensionOrder⁴⁷⁹²
- Pixels : ID⁴⁷⁹³
- Pixels : Interleaved⁴⁷⁹⁴
- Pixels : SignificantBits⁴⁷⁹⁵
- Pixels : SizeC⁴⁷⁹⁶
- Pixels : SizeT⁴⁷⁹⁷
- Pixels : SizeX⁴⁷⁹⁸
- Pixels : SizeY⁴⁷⁹⁹
- Pixels : SizeZ⁴⁸⁰⁰
- Pixels : Type⁴⁸⁰¹
- Plane : TheC⁴⁸⁰²
- Plane : TheT⁴⁸⁰³
- Plane : TheZ⁴⁸⁰⁴

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 version⁴⁸⁰⁵ or the previous versions⁴⁸⁰⁶ page to find documentation for the version you are using.

18.2.138 ZeissZVIReader

This page lists supported metadata fields for the Bio-Formats Zeiss Vision Image (ZVI) format reader.

These fields are from the OME data model⁴⁸⁰⁷. 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%).

⁴⁷⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁷⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁷⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁷⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁷⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁷⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁷⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁷⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁷⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁷⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁷⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁷⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁸⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁸⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁸⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁸⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁸⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁸⁰⁵<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁸⁰⁶<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁸⁰⁷<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 Zeiss Vision Image (ZVI) format reader:

- Channel : ID⁴⁸⁰⁸
- Channel : SamplesPerPixel⁴⁸⁰⁹
- Image : AcquisitionDate⁴⁸¹⁰
- Image : ID⁴⁸¹¹
- Image : Name⁴⁸¹²
- Pixels : BigEndian⁴⁸¹³
- Pixels : DimensionOrder⁴⁸¹⁴
- Pixels : ID⁴⁸¹⁵
- Pixels : Interleaved⁴⁸¹⁶
- Pixels : SignificantBits⁴⁸¹⁷
- Pixels : SizeC⁴⁸¹⁸
- Pixels : SizeT⁴⁸¹⁹
- Pixels : SizeX⁴⁸²⁰
- Pixels : SizeY⁴⁸²¹
- Pixels : SizeZ⁴⁸²²
- Pixels : Type⁴⁸²³
- Plane : TheC⁴⁸²⁴
- Plane : TheT⁴⁸²⁵
- Plane : TheZ⁴⁸²⁶

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 version⁴⁸²⁷ or the previous versions⁴⁸²⁸ page to find documentation for the version you are using.

⁴⁸⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁸⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁸¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁸¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁸¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁸¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁸¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁸¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁸¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁸¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁸¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁸¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁸²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁸²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁸²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁸²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁸²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁸²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁸²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁸²⁷<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁸²⁸<http://www.openmicroscopy.org/site/support/legacy/>

18.2.139 ZeissCZIReader

This page lists supported metadata fields for the Bio-Formats Zeiss CZI format reader.

These fields are from the [OME data model](#)⁴⁸²⁹. 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 : LotNumber⁴⁸³⁰
- Arc : Manufacturer⁴⁸³¹
- Arc : Model⁴⁸³²
- Arc : Power⁴⁸³³
- Arc : SerialNumber⁴⁸³⁴
- Channel : AcquisitionMode⁴⁸³⁵
- Channel : Color⁴⁸³⁶
- Channel : EmissionWavelength⁴⁸³⁷
- Channel : ExcitationWavelength⁴⁸³⁸
- Channel : FilterSetRef⁴⁸³⁹
- Channel : Fluor⁴⁸⁴⁰
- Channel : ID⁴⁸⁴¹
- Channel : IlluminationType⁴⁸⁴²
- Channel : Name⁴⁸⁴³
- Channel : PinholeSize⁴⁸⁴⁴
- Channel : SamplesPerPixel⁴⁸⁴⁵
- Detector : AmplificationGain⁴⁸⁴⁶
- Detector : Gain⁴⁸⁴⁷

⁴⁸²⁹<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁸³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁸³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁸³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁸³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁴⁸³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁸³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_AcquisitionMode

⁴⁸³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

⁴⁸³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_EmissionWavelength

⁴⁸³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ExcitationWavelength

⁴⁸³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterSetRef_ID

⁴⁸⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Fluor

⁴⁸⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁸⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_IlluminationType

⁴⁸⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁴⁸⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

⁴⁸⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁸⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_AmplificationGain

⁴⁸⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

- Detector : ID⁴⁸⁴⁸
- Detector : LotNumber⁴⁸⁴⁹
- Detector : Manufacturer⁴⁸⁵⁰
- Detector : Model⁴⁸⁵¹
- Detector : Offset⁴⁸⁵²
- Detector : SerialNumber⁴⁸⁵³
- Detector : Type⁴⁸⁵⁴
- Detector : Zoom⁴⁸⁵⁵
- DetectorSettings : Binning⁴⁸⁵⁶
- DetectorSettings : Gain⁴⁸⁵⁷
- DetectorSettings : ID⁴⁸⁵⁸
- Dichroic : ID⁴⁸⁵⁹
- Dichroic : LotNumber⁴⁸⁶⁰
- Dichroic : Manufacturer⁴⁸⁶¹
- Dichroic : Model⁴⁸⁶²
- Dichroic : SerialNumber⁴⁸⁶³
- Ellipse : ID⁴⁸⁶⁴
- Ellipse : RadiusX⁴⁸⁶⁵
- Ellipse : RadiusY⁴⁸⁶⁶
- Ellipse : Text⁴⁸⁶⁷
- Ellipse : X⁴⁸⁶⁸
- Ellipse : Y⁴⁸⁶⁹
- Experimenter : Email⁴⁸⁷⁰
- Experimenter : FirstName⁴⁸⁷¹
- Experimenter : ID⁴⁸⁷²
- Experimenter : Institution⁴⁸⁷³

⁴⁸⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴⁸⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁸⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁸⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁸⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Offset

⁴⁸⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁸⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁴⁸⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Zoom

⁴⁸⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁴⁸⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Gain

⁴⁸⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁴⁸⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

⁴⁸⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁸⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁸⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁸⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁸⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁴⁸⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusX

⁴⁸⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusY

⁴⁸⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁴⁸⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_X

⁴⁸⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_Y

⁴⁸⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_Email

⁴⁸⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_FirstName

⁴⁸⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

⁴⁸⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_Institution

- Experimenter : LastName⁴⁸⁷⁴
- Experimenter : MiddleName⁴⁸⁷⁵
- Experimenter : UserName⁴⁸⁷⁶
- Filament : LotNumber⁴⁸⁷⁷
- Filament : Manufacturer⁴⁸⁷⁸
- Filament : Model⁴⁸⁷⁹
- Filament : Power⁴⁸⁸⁰
- Filament : SerialNumber⁴⁸⁸¹
- Filter : FilterWheel⁴⁸⁸²
- Filter : ID⁴⁸⁸³
- Filter : LotNumber⁴⁸⁸⁴
- Filter : Manufacturer⁴⁸⁸⁵
- Filter : Model⁴⁸⁸⁶
- Filter : SerialNumber⁴⁸⁸⁷
- Filter : Type⁴⁸⁸⁸
- FilterSet : DichroicRef⁴⁸⁸⁹
- FilterSet : EmissionFilterRef⁴⁸⁹⁰
- FilterSet : ExcitationFilterRef⁴⁸⁹¹
- FilterSet : ID⁴⁸⁹²
- FilterSet : LotNumber⁴⁸⁹³
- FilterSet : Manufacturer⁴⁸⁹⁴
- FilterSet : Model⁴⁸⁹⁵
- FilterSet : SerialNumber⁴⁸⁹⁶
- Image : AcquisitionDate⁴⁸⁹⁷
- Image : Description⁴⁸⁹⁸
- Image : ExperimenterRef⁴⁸⁹⁹

⁴⁸⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_LastName

⁴⁸⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_MiddleName

⁴⁸⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_UserName

⁴⁸⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁸⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁸⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁸⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁴⁸⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁸⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_FilterWheel

⁴⁸⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

⁴⁸⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁸⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁸⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁸⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁸⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_Type

⁴⁸⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID

⁴⁸⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

⁴⁸⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

⁴⁸⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterSet_ID

⁴⁸⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁸⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁸⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁸⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁸⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁴⁸⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁴⁸⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ExperimenterRef_ID

- Image : ID⁴⁹⁰⁰
- Image : InstrumentRef⁴⁹⁰¹
- Image : Name⁴⁹⁰²
- Image : ROIRef⁴⁹⁰³
- ImagingEnvironment : AirPressure⁴⁹⁰⁴
- ImagingEnvironment : CO2Percent⁴⁹⁰⁵
- ImagingEnvironment : Humidity⁴⁹⁰⁶
- ImagingEnvironment : Temperature⁴⁹⁰⁷
- Instrument : ID⁴⁹⁰⁸
- Laser : LotNumber⁴⁹⁰⁹
- Laser : Manufacturer⁴⁹¹⁰
- Laser : Model⁴⁹¹¹
- Laser : Power⁴⁹¹²
- Laser : SerialNumber⁴⁹¹³
- LightEmittingDiode : LotNumber⁴⁹¹⁴
- LightEmittingDiode : Manufacturer⁴⁹¹⁵
- LightEmittingDiode : Model⁴⁹¹⁶
- LightEmittingDiode : Power⁴⁹¹⁷
- LightEmittingDiode : SerialNumber⁴⁹¹⁸
- Line : ID⁴⁹¹⁹
- Line : Text⁴⁹²⁰
- Line : X1⁴⁹²¹
- Line : X2⁴⁹²²
- Line : Y1⁴⁹²³
- Line : Y2⁴⁹²⁴
- Microscope : LotNumber⁴⁹²⁵

⁴⁹⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

⁴⁹⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁴⁹⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁴⁹⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ROIRef_ID

⁴⁹⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_AirPressure

⁴⁹⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_CO2Percent

⁴⁹⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Humidity

⁴⁹⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ImagingEnvironment_Temperature

⁴⁹⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁴⁹⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁴⁹¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁹¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_Power

⁴⁹¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁹¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁴⁹²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁴⁹²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X1

⁴⁹²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X2

⁴⁹²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y1

⁴⁹²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y2

⁴⁹²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

- Microscope : Manufacturer⁴⁹²⁶
- Microscope : Model⁴⁹²⁷
- Microscope : SerialNumber⁴⁹²⁸
- Microscope : Type⁴⁹²⁹
- Objective : CalibratedMagnification⁴⁹³⁰
- Objective : Correction⁴⁹³¹
- Objective : ID⁴⁹³²
- Objective : Immersion⁴⁹³³
- Objective : Iris⁴⁹³⁴
- Objective : LensNA⁴⁹³⁵
- Objective : LotNumber⁴⁹³⁶
- Objective : Manufacturer⁴⁹³⁷
- Objective : Model⁴⁹³⁸
- Objective : NominalMagnification⁴⁹³⁹
- Objective : SerialNumber⁴⁹⁴⁰
- Objective : WorkingDistance⁴⁹⁴¹
- ObjectiveSettings : CorrectionCollar⁴⁹⁴²
- ObjectiveSettings : ID⁴⁹⁴³
- ObjectiveSettings : Medium⁴⁹⁴⁴
- ObjectiveSettings : RefractiveIndex⁴⁹⁴⁵
- Pixels : BigEndian⁴⁹⁴⁶
- Pixels : DimensionOrder⁴⁹⁴⁷
- Pixels : ID⁴⁹⁴⁸
- Pixels : Interleaved⁴⁹⁴⁹
- Pixels : PhysicalSizeX⁴⁹⁵⁰
- Pixels : PhysicalSizeY⁴⁹⁵¹

⁴⁹²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁹²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Microscope_Type

⁴⁹³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_CalibratedMagnification

⁴⁹³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁴⁹³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

⁴⁹³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁴⁹³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Iris

⁴⁹³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

⁴⁹³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_LotNumber

⁴⁹³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Manufacturer

⁴⁹³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁴⁹³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁴⁹⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_SerialNumber

⁴⁹⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_WorkingDistance

⁴⁹⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_CorrectionCollar

⁴⁹⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁴⁹⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_Medium

⁴⁹⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_RefractiveIndex

⁴⁹⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁴⁹⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁴⁹⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁴⁹⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁴⁹⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁴⁹⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

- Pixels : PhysicalSizeZ⁴⁹⁵²
- Pixels : SignificantBits⁴⁹⁵³
- Pixels : SizeC⁴⁹⁵⁴
- Pixels : SizeT⁴⁹⁵⁵
- Pixels : SizeX⁴⁹⁵⁶
- Pixels : SizeY⁴⁹⁵⁷
- Pixels : SizeZ⁴⁹⁵⁸
- Pixels : Type⁴⁹⁵⁹
- Plane : DeltaT⁴⁹⁶⁰
- Plane : ExposureTime⁴⁹⁶¹
- Plane : PositionX⁴⁹⁶²
- Plane : PositionY⁴⁹⁶³
- Plane : PositionZ⁴⁹⁶⁴
- Plane : TheC⁴⁹⁶⁵
- Plane : TheT⁴⁹⁶⁶
- Plane : TheZ⁴⁹⁶⁷
- Polygon : ID⁴⁹⁶⁸
- Polygon : Points⁴⁹⁶⁹
- Polygon : Text⁴⁹⁷⁰
- Polyline : ID⁴⁹⁷¹
- Polyline : Points⁴⁹⁷²
- Polyline : Text⁴⁹⁷³
- ROI : Description⁴⁹⁷⁴
- ROI : ID⁴⁹⁷⁵
- ROI : Name⁴⁹⁷⁶
- Rectangle : Height⁴⁹⁷⁷

⁴⁹⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁴⁹⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁴⁹⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁴⁹⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁴⁹⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁴⁹⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁴⁹⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁴⁹⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁴⁹⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁴⁹⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_ExposureTime

⁴⁹⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

⁴⁹⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

⁴⁹⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

⁴⁹⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁴⁹⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

⁴⁹⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁴⁹⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁴⁹⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

⁴⁹⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁴⁹⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁴⁹⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polyline_Points

⁴⁹⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁴⁹⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Description

⁴⁹⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

⁴⁹⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_Name

⁴⁹⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

- Rectangle : ID⁴⁹⁷⁸
- Rectangle : Text⁴⁹⁷⁹
- Rectangle : Width⁴⁹⁸⁰
- Rectangle : X⁴⁹⁸¹
- Rectangle : Y⁴⁹⁸²
- TransmittanceRange : CutIn⁴⁹⁸³
- TransmittanceRange : CutInTolerance⁴⁹⁸⁴
- TransmittanceRange : CutOut⁴⁹⁸⁵
- TransmittanceRange : CutOutTolerance⁴⁹⁸⁶
- TransmittanceRange : Transmittance⁴⁹⁸⁷

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 version⁴⁹⁸⁸ or the previous versions⁴⁹⁸⁹ page to find documentation for the version you are using.

18.2.140 ZeissLSMReader

This page lists supported metadata fields for the Bio-Formats Zeiss Laser-Scanning Microscopy format reader.

These fields are from the OME data model⁴⁹⁹⁰. 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 : Color⁴⁹⁹¹
- Channel : ID⁴⁹⁹²
- Channel : Name⁴⁹⁹³
- Channel : PinholeSize⁴⁹⁹⁴

⁴⁹⁷⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁴⁹⁷⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁴⁹⁸⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

⁴⁹⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

⁴⁹⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

⁴⁹⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn

⁴⁹⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutInTolerance

⁴⁹⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut

⁴⁹⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOutTolerance

⁴⁹⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_Transmittance

⁴⁹⁸⁸<http://www.openmicroscopy.org/site/support/bio-formats5.0/>

⁴⁹⁸⁹<http://www.openmicroscopy.org/site/support/legacy/>

⁴⁹⁹⁰<http://www.openmicroscopy.org/site/support/ome-model/>

⁴⁹⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Color

⁴⁹⁹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_ID

⁴⁹⁹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_Name

⁴⁹⁹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_PinholeSize

- Channel : SamplesPerPixel⁴⁹⁹⁵
- Detector : AmplificationGain⁴⁹⁹⁶
- Detector : Gain⁴⁹⁹⁷
- Detector : ID⁴⁹⁹⁸
- Detector : Type⁴⁹⁹⁹
- Detector : Zoom⁵⁰⁰⁰
- DetectorSettings : Binning⁵⁰⁰¹
- DetectorSettings : ID⁵⁰⁰²
- Dichroic : ID⁵⁰⁰³
- Dichroic : Model⁵⁰⁰⁴
- Ellipse : FontSize⁵⁰⁰⁵
- Ellipse : ID⁵⁰⁰⁶
- Ellipse : RadiusX⁵⁰⁰⁷
- Ellipse : RadiusY⁵⁰⁰⁸
- Ellipse : StrokeWidth⁵⁰⁰⁹
- Ellipse : Transform⁵⁰¹⁰
- Ellipse : X⁵⁰¹¹
- Ellipse : Y⁵⁰¹²
- Experimenter : ID⁵⁰¹³
- Experimenter : UserName⁵⁰¹⁴
- Filter : ID⁵⁰¹⁵
- Filter : Model⁵⁰¹⁶
- Filter : Type⁵⁰¹⁷
- Image : AcquisitionDate⁵⁰¹⁸
- Image : Description⁵⁰¹⁹
- Image : ID⁵⁰²⁰

⁴⁹⁹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Channel_SamplesPerPixel

⁴⁹⁹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_AmplificationGain

⁴⁹⁹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Gain

⁴⁹⁹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_ID

⁴⁹⁹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Type

⁵⁰⁰⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Detector_Zoom

⁵⁰⁰¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_Binning

⁵⁰⁰²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DetectorSettings_ID

⁵⁰⁰³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Dichroic_ID

⁵⁰⁰⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁵⁰⁰⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵⁰⁰⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰⁰⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusX

⁵⁰⁰⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_RadiusY

⁵⁰⁰⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

⁵⁰¹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Transform

⁵⁰¹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_X

⁵⁰¹²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Ellipse_Y

⁵⁰¹³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_ID

⁵⁰¹⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Experimenter_UserName

⁵⁰¹⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_ID

⁵⁰¹⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁵⁰¹⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Filter_Type

⁵⁰¹⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_AcquisitionDate

⁵⁰¹⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Description

⁵⁰²⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_ID

- Image : InstrumentRef⁵⁰²¹
- Image : Name⁵⁰²²
- Image : ROIRef⁵⁰²³
- Instrument : ID⁵⁰²⁴
- Label : FontSize⁵⁰²⁵
- Label : ID⁵⁰²⁶
- Label : StrokeWidth⁵⁰²⁷
- Label : Text⁵⁰²⁸
- Label : X⁵⁰²⁹
- Label : Y⁵⁰³⁰
- Laser : ID⁵⁰³¹
- Laser : LaserMedium⁵⁰³²
- Laser : Model⁵⁰³³
- Laser : Type⁵⁰³⁴
- Laser : Wavelength⁵⁰³⁵
- LightPath : DichroicRef⁵⁰³⁶
- LightPath : EmissionFilterRef⁵⁰³⁷
- Line : FontSize⁵⁰³⁸
- Line : ID⁵⁰³⁹
- Line : StrokeWidth⁵⁰⁴⁰
- Line : X1⁵⁰⁴¹
- Line : X2⁵⁰⁴²
- Line : Y1⁵⁰⁴³
- Line : Y2⁵⁰⁴⁴
- Objective : Correction⁵⁰⁴⁵
- Objective : ID⁵⁰⁴⁶

⁵⁰²¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#InstrumentRef_ID

⁵⁰²²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Image_Name

⁵⁰²³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROIRef_ID

⁵⁰²⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Instrument_ID

⁵⁰²⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵⁰²⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰²⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

⁵⁰²⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_Text

⁵⁰²⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_X

⁵⁰³⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Label_Y

⁵⁰³¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#LightSource_ID

⁵⁰³²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_LaserMedium

⁵⁰³³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ManufacturerSpec_Model

⁵⁰³⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Type

⁵⁰³⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Laser_Wavelength

⁵⁰³⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#DichroicRef_ID

⁵⁰³⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#FilterRef_ID

⁵⁰³⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵⁰³⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰⁴⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

⁵⁰⁴¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X1

⁵⁰⁴²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_X2

⁵⁰⁴³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y1

⁵⁰⁴⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Line_Y2

⁵⁰⁴⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Correction

⁵⁰⁴⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_ID

- Objective : Immersion⁵⁰⁴⁷
- Objective : Iris⁵⁰⁴⁸
- Objective : LensNA⁵⁰⁴⁹
- Objective : NominalMagnification⁵⁰⁵⁰
- ObjectiveSettings : ID⁵⁰⁵¹
- Pixels : BigEndian⁵⁰⁵²
- Pixels : DimensionOrder⁵⁰⁵³
- Pixels : ID⁵⁰⁵⁴
- Pixels : Interleaved⁵⁰⁵⁵
- Pixels : PhysicalSizeX⁵⁰⁵⁶
- Pixels : PhysicalSizeY⁵⁰⁵⁷
- Pixels : PhysicalSizeZ⁵⁰⁵⁸
- Pixels : SignificantBits⁵⁰⁵⁹
- Pixels : SizeC⁵⁰⁶⁰
- Pixels : SizeT⁵⁰⁶¹
- Pixels : SizeX⁵⁰⁶²
- Pixels : SizeY⁵⁰⁶³
- Pixels : SizeZ⁵⁰⁶⁴
- Pixels : TimeIncrement⁵⁰⁶⁵
- Pixels : Type⁵⁰⁶⁶
- Plane : DeltaT⁵⁰⁶⁷
- Plane : PositionX⁵⁰⁶⁸
- Plane : PositionY⁵⁰⁶⁹
- Plane : PositionZ⁵⁰⁷⁰
- Plane : TheC⁵⁰⁷¹
- Plane : TheT⁵⁰⁷²

⁵⁰⁴⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Immersion

⁵⁰⁴⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_Iris

⁵⁰⁴⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_LensNA

⁵⁰⁵⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Objective_NominalMagnification

⁵⁰⁵¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#ObjectiveSettings_ID

⁵⁰⁵²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_BigEndian

⁵⁰⁵³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_DimensionOrder

⁵⁰⁵⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_ID

⁵⁰⁵⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Interleaved

⁵⁰⁵⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeX

⁵⁰⁵⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeY

⁵⁰⁵⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_PhysicalSizeZ

⁵⁰⁵⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SignificantBits

⁵⁰⁶⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeC

⁵⁰⁶¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeT

⁵⁰⁶²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeX

⁵⁰⁶³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeY

⁵⁰⁶⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_SizeZ

⁵⁰⁶⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_TimeIncrement

⁵⁰⁶⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Pixels_Type

⁵⁰⁶⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_DeltaT

⁵⁰⁶⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionX

⁵⁰⁶⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionY

⁵⁰⁷⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_PositionZ

⁵⁰⁷¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheC

⁵⁰⁷²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheT

- Plane : TheZ⁵⁰⁷³
- Polygon : FontSize⁵⁰⁷⁴
- Polygon : ID⁵⁰⁷⁵
- Polygon : Points⁵⁰⁷⁶
- Polygon : StrokeWidth⁵⁰⁷⁷
- Polyline : FontSize⁵⁰⁷⁸
- Polyline : ID⁵⁰⁷⁹
- Polyline : Points⁵⁰⁸⁰
- Polyline : StrokeWidth⁵⁰⁸¹
- ROI : ID⁵⁰⁸²
- Rectangle : FontSize⁵⁰⁸³
- Rectangle : Height⁵⁰⁸⁴
- Rectangle : ID⁵⁰⁸⁵
- Rectangle : StrokeWidth⁵⁰⁸⁶
- Rectangle : Width⁵⁰⁸⁷
- Rectangle : X⁵⁰⁸⁸
- Rectangle : Y⁵⁰⁸⁹
- TransmittanceRange : CutIn⁵⁰⁹⁰
- TransmittanceRange : CutOut⁵⁰⁹¹

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 version⁵⁰⁹² or the previous versions⁵⁰⁹³ page to find documentation for the version you are using.

⁵⁰⁷³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#Plane_TheZ

⁵⁰⁷⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵⁰⁷⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰⁷⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Polygon_Points

⁵⁰⁷⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

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#Polyline_Points

⁵⁰⁸¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

⁵⁰⁸²http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#ROI_ID

⁵⁰⁸³http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_FontSize

⁵⁰⁸⁴http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Height

⁵⁰⁸⁵http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_ID

⁵⁰⁸⁶http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Shape_StrokeWidth

⁵⁰⁸⁷http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Width

⁵⁰⁸⁸http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_X

⁵⁰⁸⁹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ROI_xsd.html#Rectangle_Y

⁵⁰⁹⁰http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutIn

⁵⁰⁹¹http://www.openmicroscopy.org/Schemas/Documentation/Generated/OME-2015-01/ome_xsd.html#TransmittanceRange_CutOut

⁵⁰⁹²<http://www.openmicroscopy.org/site/support/bio-formats/5.0/>

⁵⁰⁹³<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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