

Topic:

This technical note describes additional information stored with TIFF files exported from Phylum or Volocity 3.5.1 or higher. This additional information includes properties from Phylum and Volocity that are not part of the standard TIFF format.

Description:

Volocity will read and write the following information when exporting or importing TIFF images. The additional data is stored as text in the IMAGEDESCRIPTION tag (270) for each page (image) in the TIFF file.

The text has this format:

```
[Improvision Data]
ImageName=<the name of the image>
TimeStampMicroseconds=<timestamp in microseconds>
TimeStamp=<time and date in readable format>
XCalibrationMicrons=<X calibration in μm>
YCalibrationMicrons=<Y calibration in μm >
ZCalibrationMicrons=<Z calibration in μm >
ChannelName=<name of the channel>
TimepointName=<name of the timepoint>
.
.
.
```

Each line is separated by a return character (\r).

BlackPoint	Pixel value that is considered to be black in the image. Pixels with this value or lower will be rendered as black. (Volocity/Phylum 4.0 and higher)
ChannelName	Name of the channel this image came from
ChannelNo	Number of the channel. This must be a numeric sequence starting at 1, i.e. 1, 2, 3 etc. (Volocity/Phylum 4.0 and higher)
ImageName	The name of the image as ASCII text
TimepointName	Name of the timepoint this image came from. This is often a numeric sequence (e.g. 1, 2, 3), though it does not have to be
TimepointNo	Number of the timepoint. This must be a numeric sequence sequence starting at 1, i.e. 1, 2, 3 etc. (Volocity/Phylum 4.0 and higher)
TimeStamp	The timestamp of the image in human-readable form

TimeStampMicroseconds	<p>The timestamp value in microseconds. This value can be interpreted in two ways:</p> <p>If this value is less than or equal to:</p> $1000000 \times 60 \times 60 \times 24 \times 365 = 3.1536e13 = 1 \text{ year in microseconds}$ <p>then this should be treated as a relative time since the beginning of the experiment (or the beginning of the sequence).</p> <p>If the value is greater than 3.1536e13, it should be treated as an absolute time in microseconds since 00:00 on 1 Jan 1904.</p> <p>Note that this number is a 64-bit integer value and will exceed the limits of a 32-bit integer.</p>
TotalChannels	The total number of channels in the file. (Volocity/Phylum 4.0 and higher)
TotalTimepoints	The total number of timepoints in the file. (Volocity/Phylum 4.0 and higher)
TotalZPlanes	The total number of Z planes in the file. (Volocity/Phylum 4.0 and higher)
WhiteColour	RGB triplet describing the white color (or color tint) for the image. The values are on a scale of 0 to 255. (Volocity/Phylum 4.0 and higher)
WhitePoint	Pixel value that is considered to be white in the image. Pixels with this value or higher will be rendered with the white color. (Volocity/Phylum 4.0 and higher)
XCalibrationMicrons	Width of each voxel in micrometres
YCalibrationMicrons	Height of each voxel in micrometres
ZCalibrationMicrons	Depth of each voxel in micrometres
ZPlane	Number of the Z plane. This must be a numeric sequence starting at 1, i.e. 1, 2, 3 etc. (Volocity/Phylum 4.0 and higher)

Here are two examples from Volocity 3.5.1:

```
[Improvisation Data]
ImageName=Improvisation's example image
TimeStampMicroseconds=1100000
TimeStamp=00:00:01.1
XCalibrationMicrons=0.045
YCalibrationMicrons=0.045
ZCalibrationMicrons=0.1
ChannelName=Channel 1 (FITC)
```

TimepointName=1

```
[Improvisation Data]
ImageName=Another example image
TimeStampMicroseconds=3086679815852057
TimeStamp=12:03:35.852 on 23 Oct 2001
XCalibrationMicrons=0.134
YCalibrationMicrons=0.134
ZCalibrationMicrons=0.2
ChannelName=Channel 2 (DAPI)
TimepointName=T3
```

Here is an example from Volocity 4.0:

```
[Improvisation Data]
ImageName=Mitosis 4D Sequence T=1 C=1 (Red) Z=1
TimeStampMicroSeconds=3115370439294958
TimeStamp=13:40:39.294 on 20 Sep 2002
ChannelName=1 (Red)
ChannelNo=1
TimepointName=1
TimepointNo=1
ZPlane=1
BlackPoint=0
WhitePoint=255
WhiteColour=255,0,0
XCalibrationMicrons=0.2
YCalibrationMicrons=0.2
ZCalibrationMicrons=1
TotalChannels=2
TotalTimepoints=40
TotalZPlanes=14
```

Lines may or may not be present depending on the data available for the original images. New data may be added to this list later, however the format and meaning of the data described above will not change.