

TeliU3vViewer

User's Guide

Ver.1.0.0

TOSHIBA TELI CORPORATION

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1. About This Document

This document describes how to use an image viewer application software for USB3 Vision cameras called **TeliU3vViwer**.

2. System Requirements

A host computer should satisfy the following requirements to run the viewer. These requirements are the minimum recommendation and some resource consuming features might require you to have more high performance equipment.

2.1. Supported Operating Systems

Supported operating systems are listed as follows.

- Windows XP SP3, 32bit
- Windows Vista, 32bit/64bit
- Windows 7, 32bit/64bit
- Windows 8.1, 32bit/64bit

2.2. Recommended Computer Specifications

CPU: Pentium D, 2.66GHz or higher

Memory: 1GByte or more

Graphics: with 128MByte or more VRAM

2.3. Recommended USB3 Adapter Cards

We recommend the adapters which work with a Renesas Electronics host controller.

2.4. Supported Cameras

TeliU3vViwer supports only Toshiba Teli's USB3 cameras.

2.5. Required Runtime Libraries

The following runtime libraries are necessary to run the viewer.

- GenICam GenApi reference implementation v.2.3.0 or later
- Microsoft Visual C++ 2010 SP1 Redistributable Package (x86/x64)
- Microsoft Direct X End-User Runtime (DirectX 9.0c or later)

3. Using TeliU3vViewer

Please complete each setup procedure in advance following another document titled “Startup guide”. TeliU3vViewer cannot be launched if any of the required procedure was not completed.

3.1. Launching Viewer

Launch **TeliU3vViewer.exe** located in the installation directory. The following main screen will appear.

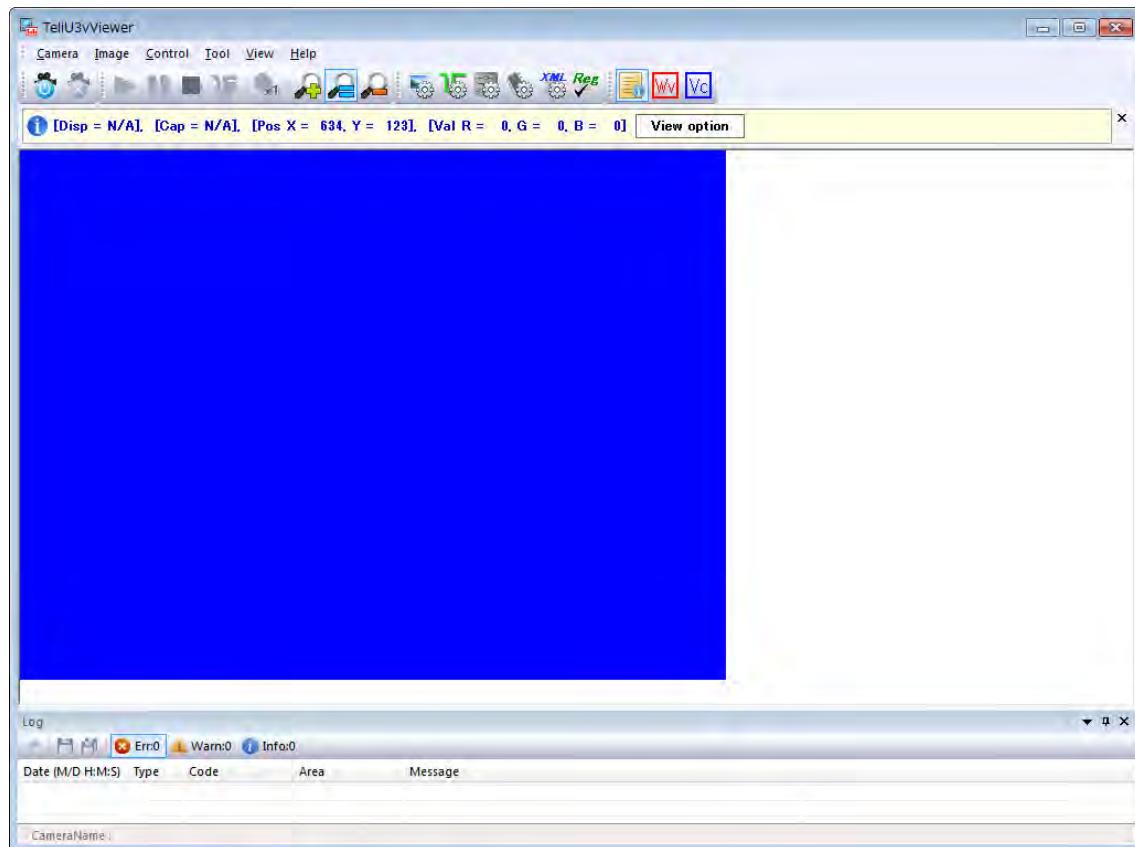


Figure 1: The main screen.

3.2. Closing Viewer

To terminate the viewer, click **x** in the top-right corner of the main screen or click **Camera > Exit** in the menu bar.

4. Controlling a Camera

In this chapter, you will learn how to control a camera from the viewer.

4.1. Connecting to a Camera

The camera selection dialog box will appear clicking **Open** in the tool bar or **Camera > Open** in the menu bar. Select a camera displayed in the dialog box and click **Open** to connect to the camera. To disconnect from the camera, click **Close**.

- **Open**  Click the button to connect to the target camera.

- **Close**  Click the button to disconnect from the target camera.

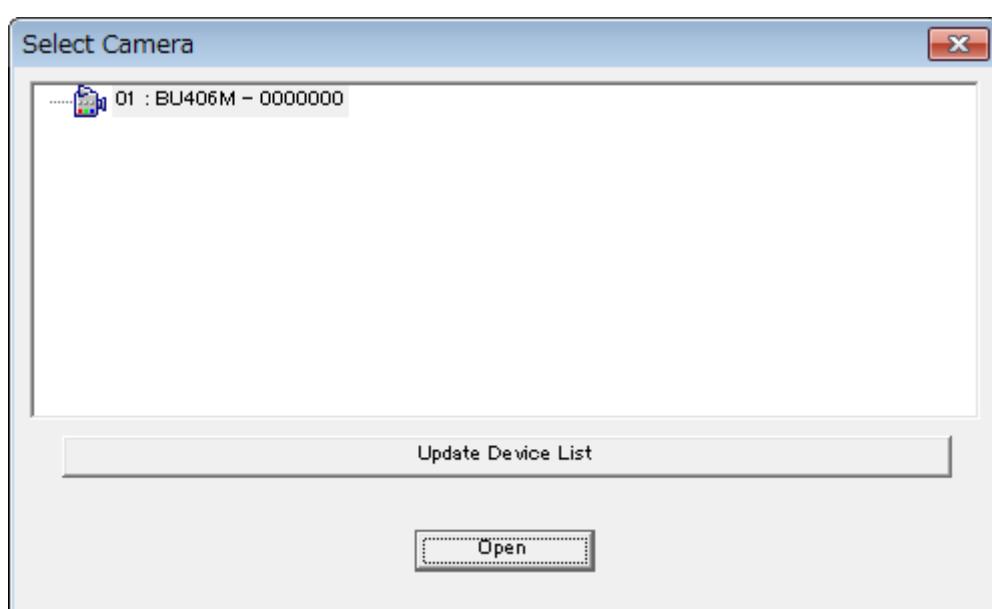


Figure 2: Selecting a camera to control.

4.2. Acquiring Images

After successfully connected to a camera, you can set up the camera to acquire images. Controlling a camera for that purpose, you will use the following tool box or the correspond items in **Image** in the menu bar.



Figure 3: Image tool box.

- **Start**

Click the button to start image acquisition. Images will be immediately displayed in the display section when they are acquired by the viewer.

- **Pause**

Click the button to pause displaying images. Please note that the image acquisition thread will be still running in the background even though the display section was not updated.

- **Stop**

Click the button to stop image acquisition.

- **One shot**

Click the button to generate a software trigger to the target camera. To set up a camera so that it accepts a software trigger as a stimulation to start image acquisition, please go through the following instructions.

1. Open the **Trigger** tab clicking **Trigger Settings** in the tool bar or **Control > Trigger** in the menu bar.
2. To turn on random trigger shutter mode, select **On** in the **TriggerMode** drop-down list in the **AcquisitionControl** section, and select **Software** in the **TriggerSource** drop-down list.
3. Click **Start** in the tool bar or **Image > Start** in the menu bar. Having clicked **Start**, the **One shot** button in the tool box will be activated.
4. Clicking **One shot** in the tool bar or **Image > One Shot** in the menu bar, a software trigger will be generated. The display section will be updated with a new image every time an

image is acquired by the viewer.

- **Snap**

Click the button to save a still image displayed in the display section. Having clicked the button, a common dialog window titled “Save with name” will appear to get a filename for the image to be saved. The Image will be saved as a 32bit bitmap file.

- **Zoom in**

Click the button to display images enlarging the original version. It's available up to 800%.

- **100%**

Click the button to display images in the original size, i.e., 100%.

- **Zoom out**

Click the button to display images shrinking the original version. It's available down to 12.5%.

4.3. Controlling a Camera

You can access camera registers to control the connected camera. The **Control** tabs section will appear by clicking the **Control** button in the tool bar or **Control** in the menu bar. Push **x** to close a tab.



Figure 4: Control tool box.

The **Control** tabs section consists of the following tabs.

- **Image**

Click the button to show the tab which consists of image related features such as pixel format, size, etc.



- **Trigger** 

Click the button to show the tab which consists of trigger signal related features.

- **Feature** 

Click the button to show the tab which consists of camera related features such as exposure time, gain, black level, etc.

- **Memory** 

Click the button to show the tab which consists of user set related features.

- **XML** 

Click the button to show the tab which lists the all GenApi nodes in the camera description file. You can control each feature node in the tab. The categories listed above are collection of feature nodes, which were categorized for usability.

- **Register** 

Click the button to show the tab to directly access camera registers. In general, they are used for debugging purpose.



4.4. Appearance: Feature Layout in Tabs

4.4.1. Image Tab

Figure 5 shows the appearance of the **Image** tab.

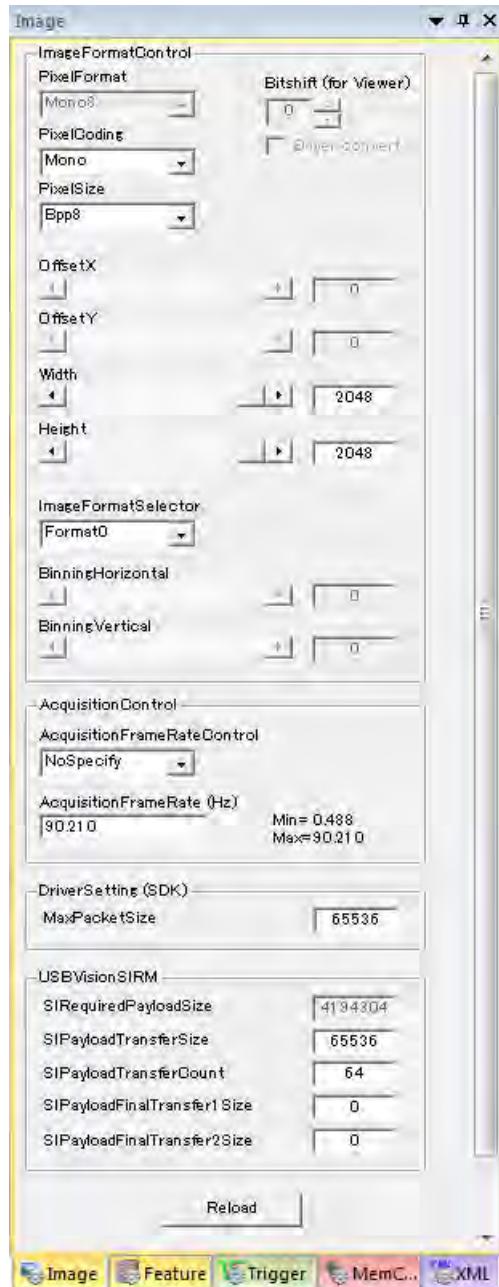


Figure 5: Image tab.

4.4.2. Feature Tab

Figure 6 shows the appearance of the **Feature** tab.

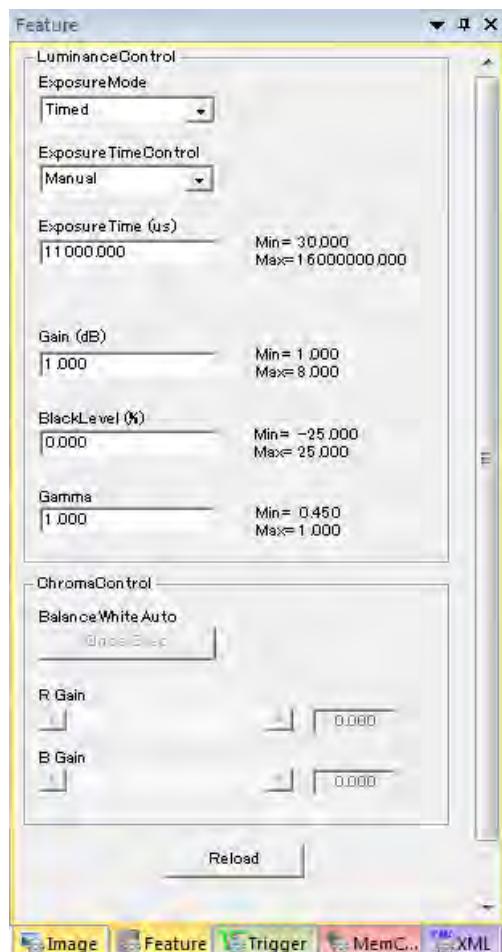


Figure 6: Feature tab.



4.4.3. MemCtrl Tab

Figure 7 shows the appearance of the **MemCtrl** tab.



Figure 7: MemCtrl tab.

4.4.4. Trigger Tab

Figure 8 shows the appearance of the **Trigger** tab.

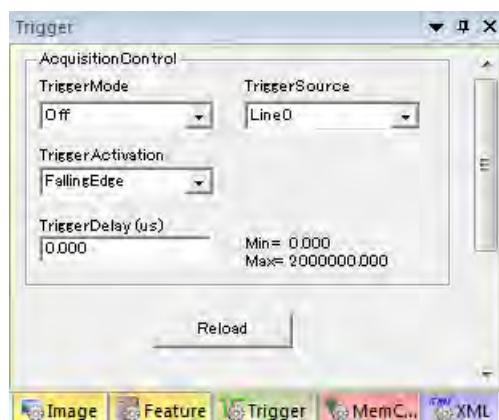


Figure 8: Trigger tab.



4.5. Image Tab

Image related features can be controlled in the **Image** tab.

4.5.1. Pixel Format Related Features

● PixelFormat

Shows the current pixel format, which has been applied to the images.

● PixelCoding

Select a pixel coding type such as BayerRG or Mono which is listed in the drop down list box. You have to stop acquiring images to change the value.

● PixelSize

Select a bit depth that a single pixel data can hold. You have to stop acquiring images to change the value.

● Bitshift

In case of the pixel format has a bit depth over 10 bits such as Mono10 or BayerRG10, you can shift the bit range to display in the display section. Each pixel data will be n-bit right-shifted by the number of bits which is set in the edit box.

● Bayer convert

In case of a color model which transfers images in Bayer format, you can chose either way to display images as raw data or filtered RGB data demosaicing them. To turn on/off the filter feature, you have to stop image acquisition.

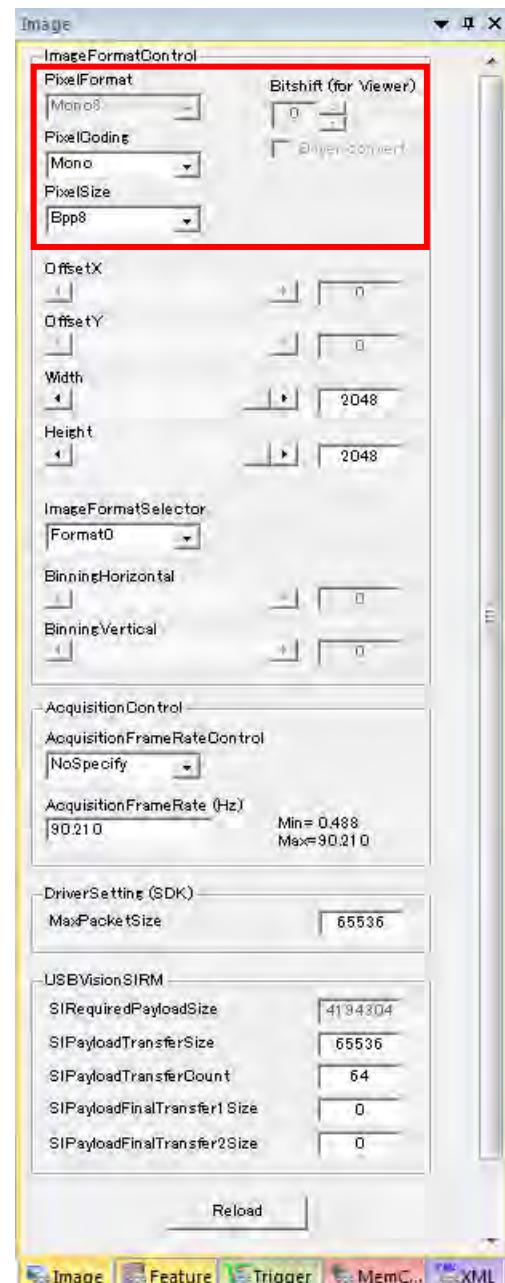


Figure 9: Pixel format related features.

4.5.2. Region of Interest (ROI) Related Features

You can have a specific size of area in the whole region produced by the effective pixels. Having specified arbitrary read-out region, in general, it boosts frame rate and/or reduces the payload size consumed by the image data comparing to the case reading out the whole effective region. You can configure ROI in the **ImageFormatControl** section in the **Image** tab. You have to stop image acquisition while you change either of the following features.

- **OffsetX**

Set a position in the X-coordinate to start reading.

- **OffsetY**

Set a position in the Y-coordinate to start reading.

- **Width**

Set the horizontal width of the image.

- **Height**

Set the vertical height of the image.

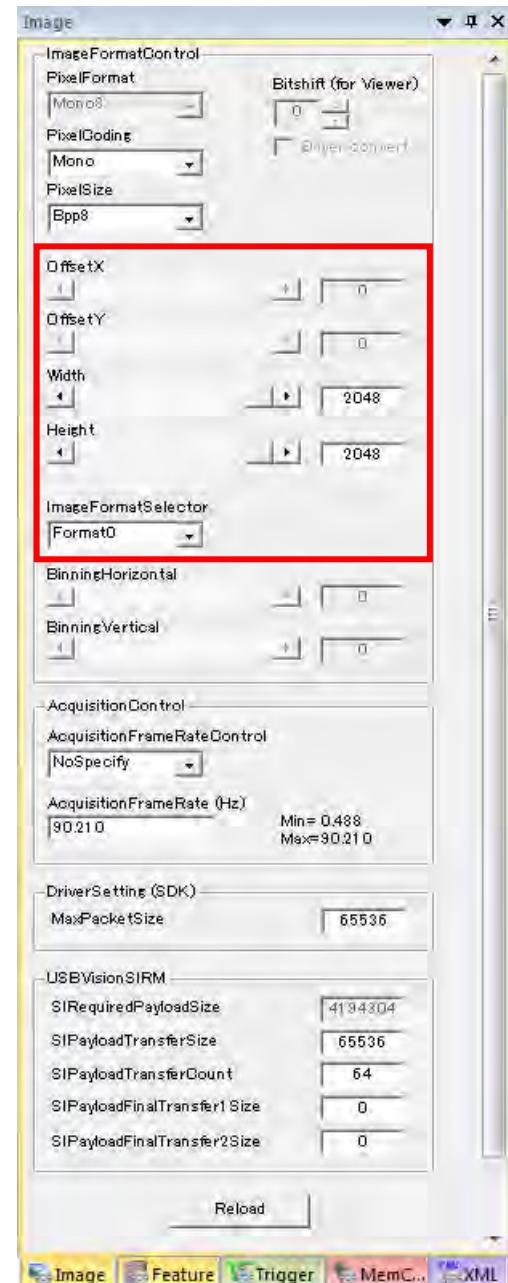


Figure 10: ROI related features.

4.5.3. Binning Related Features

According to the Standard Feature Naming Convention, SFNC in short, binning feature is defined as a feature which combines arbitrary number of horizontal/vertical photo-sensitive cells to increase the intensity or signal to noise ratio. Having enabled the feature, horizontal/vertical resolution will also be reduced following the number of combined cells. Binning related feature is controlled in the **ImageFormatControl** section. You have to stop image acquisition while you change either of the following features.

- **BinningHorizontal**

Set the number of horizontal pixels to combine.

- **BinningVertical**

Set the number of vertical pixels to combine.

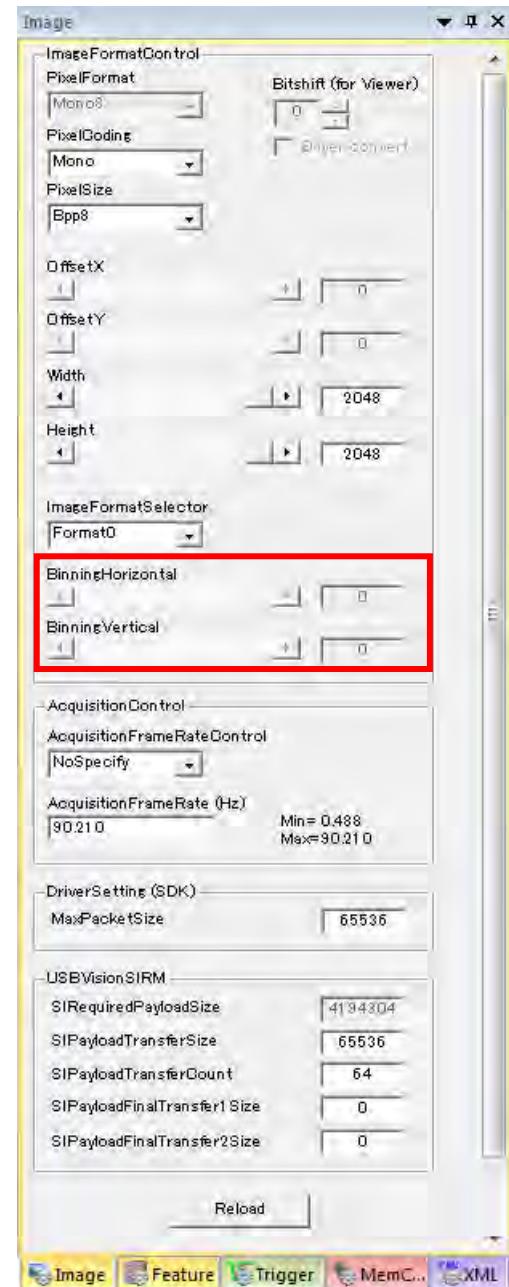


Figure 11: Binning related features.

4.5.4. Frame Rate Feature

Frame rate can be controlled in **AcquisitionControl** section in the **Image** tab. You have to stop image acquisition while you change either of the following features.

- **AcquisitionFrameRateControl**

Select **NoSpecify** to apply the fastest frame rate; **AcquisitionFrameRate** is available while **AcquisitionFrameRateControl** holds **NoSpecify**. Select **Manual** to apply an arbitrary frame rate.

- **AcquisitionFrameRate**

Set frame rate to acquire in Hz. The value must be in the range defined by “Min.” and “Max.”

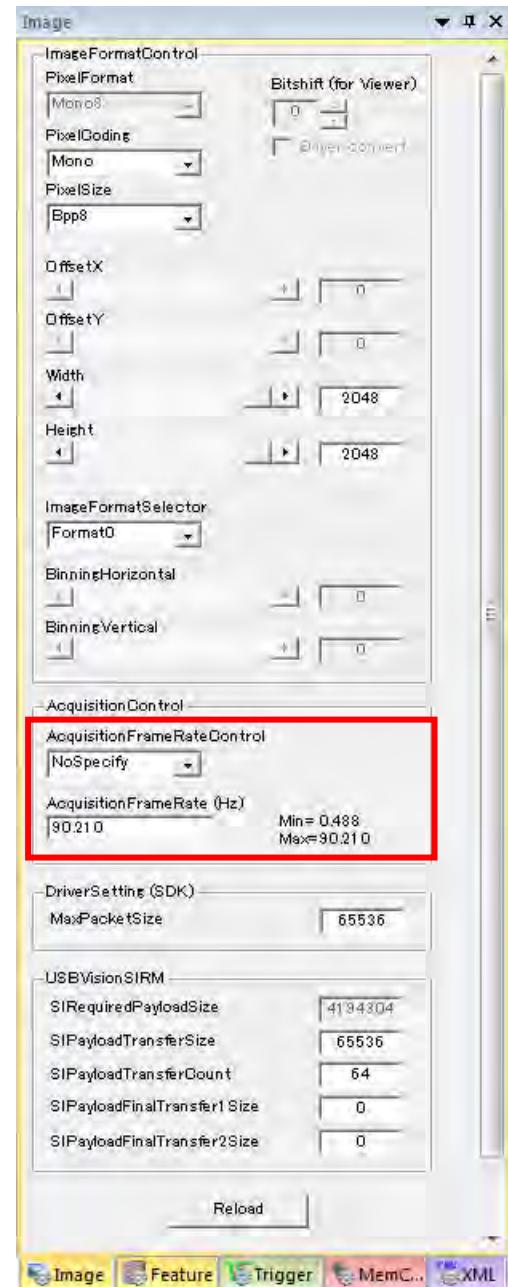


Figure 12: Acquisition related features.

4.6. Trigger Tab

Trigger related features can be controlled in the **Trigger** tab.

4.6.1. Random Trigger Shutter Related Features

Trigger mode, trigger source and trigger polarity can be controlled in **AcquisitionControl** section **Trigger** tab.

- **TriggerMode**

Turns on/off random trigger shutter mode. Select **On** to turn on random trigger shutter mode. Selecting **Off**, the camera is triggered by the internal trigger source.

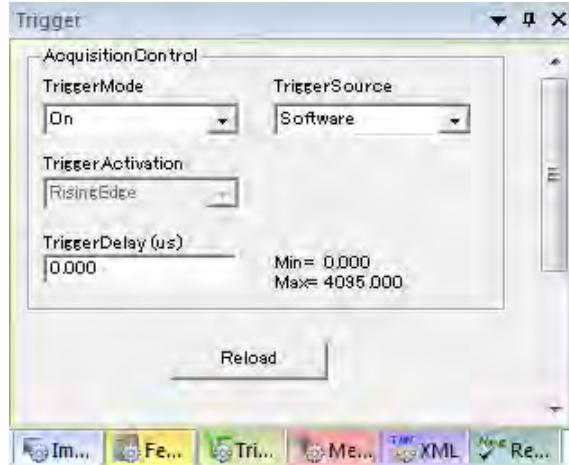


Figure 13: Random trigger shutter related features.

- **TriggerSource**

Set a trigger source. Select **Line0** to take a trigger signal over the I/O connector or **Software** to take a trigger signal from a packet on the bus.

- **TriggerActivation**

Set a trigger polarity to configure signal activity. Select **FallingEdge** to take a transition which goes high to low as active. Select **RisingEdge** to take a transition which goes low to high as active.

- **TriggerDelay**

Set amount of delay between the active signal and the point to start exposure of the imaging sensor. The value must be in the range between the minimum and the maximum.

4.7. Feature Tab

Various unclassified features are located in the **Feature** tab.

4.7.1. Exposure Time Related Features

Exposure time related features can be controlled in **AcquisitionControl** section in the **Feature** tab.

● **ExposureMode**

Set a mode of random trigger shutter feature. Select **Timed** to specify exposure time by the value of **ExposureTime** feature node. Select **TriggerWidth** to specify exposure time by the active duration of the external trigger signal. The value is ignored while random trigger shutter mode is off.

● **ExposureTimeControl**

Turns on/off automatic exposure time control feature. Select **Continuous** to turn on the feature. Select **Off** to manually control the exposure time.

● **ExposureTime**

Set an exposure time to apply. The value is ignored while the automatic control feature is on. The value must be in the range between the minimum and the maximum.

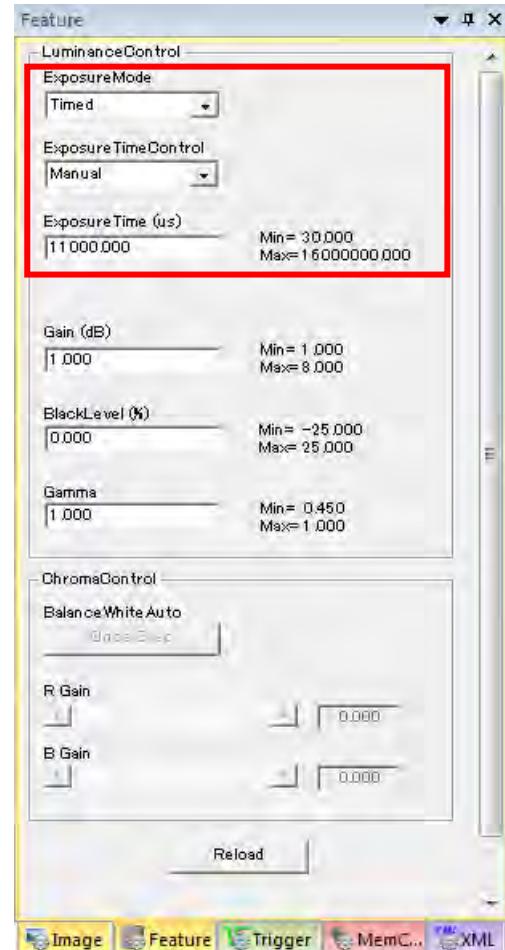


Figure 14: Exposure time related features.

4.7.2. Gain, Black Level, and Gamma

Gain, black level, and gamma correction can be controlled in **AnalogControl** section in **Feature** tab.

- **Gain**

Set gain in dB. The value must be in the range between the minimum and the maximum.

- **BlackLevel**

Set black level of the images in percent. The value must be in the range between the minimum and the maximum.

- **Gamma**

Set the exponent of its base for the gamma correction. The value must be in the range between the minimum and the maximum.

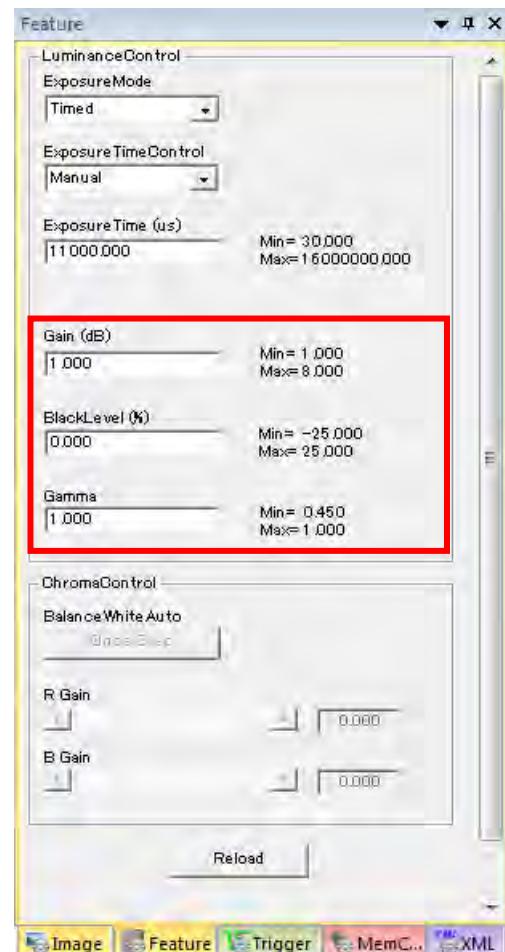


Figure 15: Gain, black level, and gamma.

4.7.3. White Balance Related Features

The color models support white balance related features and they can be controlled in **AnalogControl** section in the **Feature** tab.

- **BalanceWhiteAuto**

Clicking the **Once Exec** button, camera will automatically adjust both R and B gain to balance them assuming the object must be white.

- **R Gain**

Set the gain to be applied to the R channel in times.

- **B Gain**

Set the gain to be applied to the B channel in times.

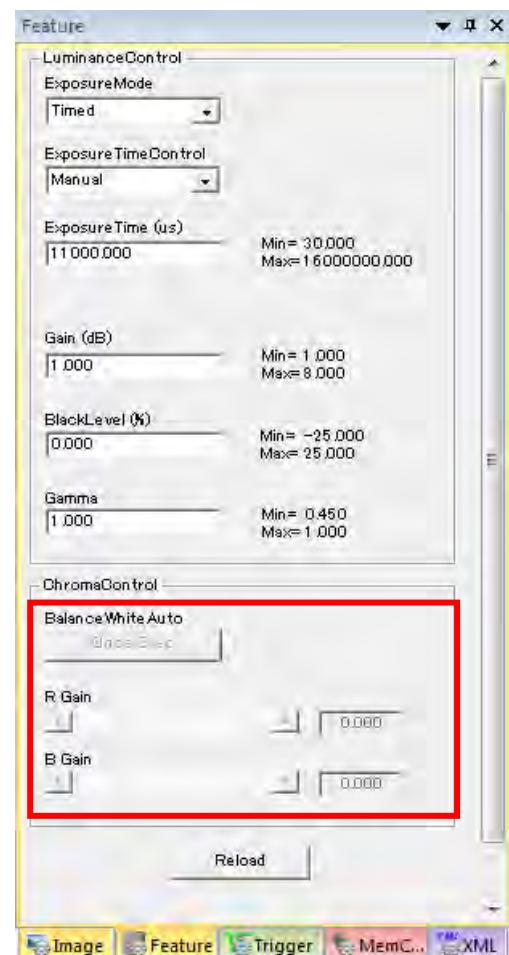


Figure 16: White balance related features.

4.8. MemCtrl Tab

User set related features can be controlled in the **MemCtrl** tab.

4.8.1. User Set Related Features

User setting can be saved to and loaded from the internal non-volatile memory of the camera. User set related features can be controlled in **UserSetControl** section in the **MemCtrl** tab.

- **UserSetSelector**

Select a memory channel to be manipulated by the following features.

- **UserSetDefaultSelector**

Select a memory channel to load at every power up cycle.

- **UserSetLoad**

Click the button to load and apply the user set selected by **UserSetSelector**. You have to stop image acquisition when you load a user set.

- **UserSetSave**

Click the button to save the current user set to the memory channel selected by **UserSetSelector**. You cannot save any user set to **UserSet0** because it's the factory default.

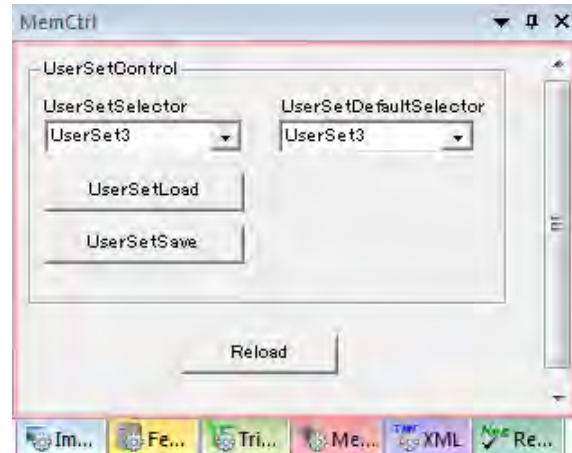


Figure 17: User set related features.



4.9. Using Utility Tools

TeliU3vViewer offers you some useful tools and you might use them clicking either button in the tool bar or the items in **Tool** in the menu bar.



- **Log** 

The logging tool is used to display various types of log messages. There are three types of categories such as **Error**, **Warning** and **Information**. Having activated either category, the log messages will be filtered and displayed in the log pane.

- **Waveform** 

The waveform tool is a simple waveform viewer. You might use it to check each level of each vertical pixel.

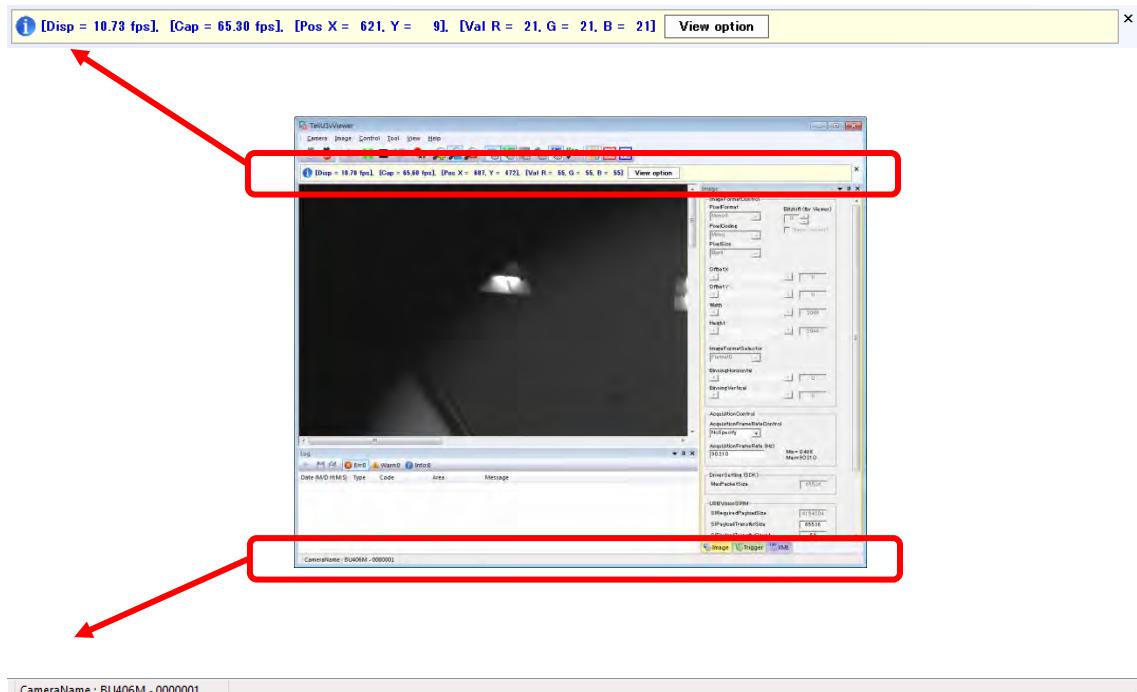
- **Vector** 

The vector tool is a simple vector scope. You might use it to adjust the color balance of a color camera.



4.10. Miscellaneous

Image display or acquisition frequency, the pixel data information pointed by your mouse pointer will be displayed in the following section which is located in the top of the main screen. To hide the section, click the **x** button located in the right side of the section. The camera information is displayed in the status bar which is located in the bottom of the main screen.



You can show/hide arbitrary section clicking an item in **View** in the menu bar. The almost section can be detached or docked to the main screen. It offers you to customize the appearance of the main screen.

5. Miscellaneous

5.1. Revision History

| Date (YYYY/MM/DD) | Version | Description |
|----------------------|---------|--|
| 2016/09/02 | 1.0.0 | Initial release of the English version. |
| 2018/01/16 | 1.0.0 | Updated the contact information: Still keeps the version number because it's a minor change which doesn't affect to product's specification. |

5.2. Disclaimer

Disclaimer of this application software is described in "License Agreement TeliCamSDK Eng.pdf" that is located in the installation directory.

5.3. Licenses

Microsoft, Windows, Windows XP, Windows Vista, Windows 7, Windows 8 and Visual C++ are trademark or registered trademark of Microsoft. Other product names are trademark or registered trademark of each company. Please refer to the Documents/Licenses folder in the installation folder to lean the licenses.

5.4. Inquiry

If you should have any questions regarding our products, please feel free to send a message to the following contact information:

Imaging Solution Engineering Section
Toshiba Teli Corporation

Postal Address: 4-7-1, Asahigaoka, Hino, Tokyo, 191-0065, JAPAN
E-mail: TELI-EXT-technical-support@toshiba-teli.co.jp

Our FAQ page is also available at the following URL:

<https://secure.toshiba-teli.co.jp/ttfa/web/faq/top.html>