

User's Guide Baumer Camera Explorer Baumer GAPI Test Tool v2.10.0

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1. Introduction

The *Baumer GAPI Camera Explorer* is the perfect evaluation tool for all Baumer cameras with GigE, Dual-GigE and USB interfaces and is part of the generic application programming interface from Baumer.

It allows you to investigate the extensive functionality of our innovative cameras.

The Tool provides you with an easy to use graphical user interface to test your specific camera features and allows different camera models to be opened simultaneously.

The *Baumer GAPI Camera Explorer* supports cameras with one GigE port (Single-GigE), with two GigE ports (Dual-GigE) and cameras with a USB port. The use of cameras with dual GigE requires the prior setting of Link Aggregation Group Configuration (LAG).

2. General System Requirements

Single-camera system		Multi-camera system
Recommended		
CPU	Intel(R) Core(TM) i5-2520M CPU @ 2.50GHz, Cores: 4	Intel(R) Core(TM) i7-3770 CPU @ 3.40GHz, Cores: 8
RAM	4 GB	8 GB
Operating system (OS)		
GigE Vision®	Microsoft® Windows® 7 32/64 bit systems	
Windows®	Microsoft® Windows® 8 32/64 bit systems	
	Microsoft® Windows® 10 32/64 bit systems	
	Linux®	OpenSUSE 13.1 / 42.3 Ubuntu® 14.04 / 16.04 Fedora 26 / 27 Debian 8.10 / 9.3
USB3 Vision™	Microsoft® Windows® 7 32/64 bit systems	
	Microsoft® Windows® 8 32/64 bit systems	
	Microsoft® Windows® 10 32/64 bit systems	
	Linux®	(Linux Kernel ≥ 3.3) OpenSUSE 13.1 / 42.3 Ubuntu® 14.04 / 16.04 Fedora 26 / 27 Debian 8.10 / 9.3
Graphics	recommended resolution at least 1280 x 1024, color depth 32 bit	

Notice

For full use of GigE Vision® the blocking of the firewall must be repealed.

3. User Interface

3.1 Program Start

Open the Baumer Camera Explorer via "Start" → "All Programs" → "Baumer GAPI SDK" → "Camera Explorer xx¹".

Notice

There are several command-line parameters. To get an overview, start with -h.
(`bexplorer.exe -h`)

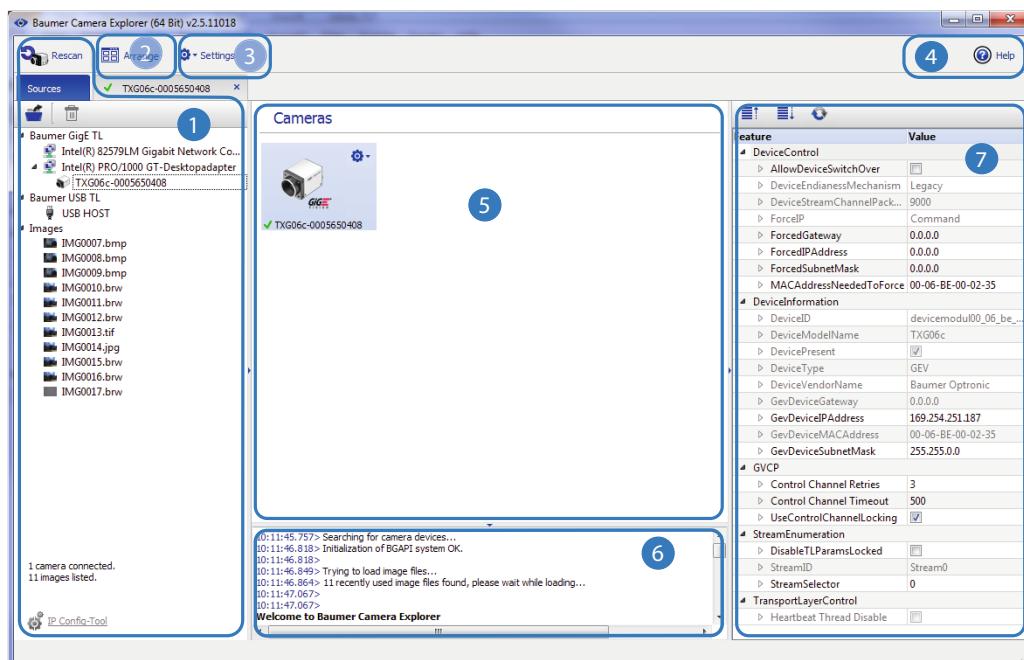
3.2 Start Screen

The Camera Explorer can have the following start conditions:

- if no camera is connected, the last snapshot is displayed or nothing
- if only one camera is connected, a live image is displayed immediately (If *Automatic start of image acquisition on live view* is enabled.)
- if several cameras were connected during the last session, they will be displayed with their availability marked / If the option *Open camera view automatically* (⚙️ - on camera) is activated, the respective camera(s) view will open automatically

The number and position of the windows are restored as at the last session.

On the Start Screen, you will find a user interface that is separated into several areas, which are described in greater detail within the following paragraphs.



◀ Figure 1
Start Screen with marked areas

1 Source tree
[see chapter 5.3](#)

2 Arrange Windows
[see chapter 3.3](#)

3 Program Settings
[see chapter 3.3.1](#)

4 Help
[see chapter 3.3.2](#)

5 Cameras / Images
[see chapter 3.3.3](#)

6 System Status / Log View
[see chapter 3.3.4](#)

7 Main Class Features
[see chapter 3.3.5](#)

1) xx stands for 32 or 64, i.e. 32 / 64 bit as defined by the OS used

3.2.1 Source tree

In this area, all existing sources, cameras and images are displayed in a tree list. The cameras are displayed under the name of the respective interface (hardware) and producer.

You can open the selected image or camera by double clicking.

This area can be expanded and collapsed.

After selecting a camera from the list by double clicking, a new camera tab with the *Camera View* (see chapter 3.5) will be opened.

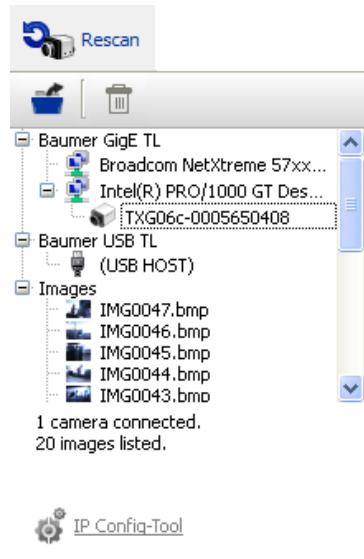


Figure 2 ►

Source tabs with located TXG Camera and snapshots.

This area shows the following icons with functions as described below:

Icon	Description
	Start search for available cameras. The cameras recognized are listed under the respective interface.
	You can use this function to load images from the PC.
	Remove the selected image. Cameras cannot be deleted. Notice Selected images are removed only from the GUI and remain in their storage location.
	You can use this function to set the width of the area. At a certain point, the area closes completely. Here, several options for the GigE interface in terms of persistent IP Options, Force IP Options and more, can be adjusted. Notice The IP Config-Tool is a separate program and not part of the Baumer GAPI Camera Explorer. It is available only on Microsoft® Windows®.

Figure 3 ►

Source tab icons and their functions

3.3 Arrange Windows

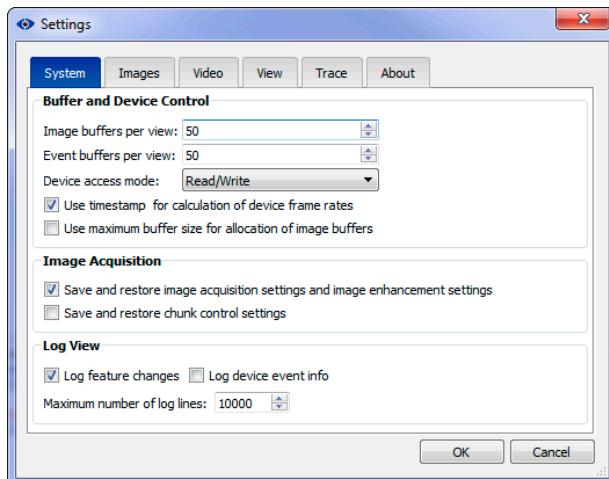
Icon	Description
 Arrange	<p>Open all cameras and tabs (images).</p> <p>Notice</p> <p>This button is only available if the <i>Open camera view automatically</i> function is activated for at least one camera, or if tabs are opened.</p> <p>Settings for <i>Arrange windows</i>: <i>Program settings</i> → <i>View / Arrange Windows</i></p>

3.3.1 Program Settings

Several program options can be adjusted here.

Icon	Description
	This icon or [F10] will open the dialog window for program configurations.

System



Function	Description
Buffer and Device Control	
Image buffers per view	<p>Set the number of image buffers (2-500).</p> <p>Notice Extended buffering will prevent image loss but requires a larger memory capacity. Only set the required buffer number (1 buffer = 1 image). The system does not check whether there is sufficient memory available.</p>
Event buffers per view	Set the number of event buffers.
Device access mode	<p>Define the access authorisation rights.</p> <p>Read/Write: full access Read Only: access to read the features only Exclusive: camera locked for other applications</p>
Use timestamp for calculation of device frame rates	<p>Uses the time stamps of images to calculate the frame rate, this is more accurate than timing via the PC.</p> <p>Notice Whether this feature is supported depends on the connected camera.</p>
Use maximum buffer size for allocation of image buffers	<p>Disable this option to save system memory or to allocate image buffers as much as possible.</p> <p>Enable this option to prevent display errors when the size of the allocated image buffers will become smaller than the current payload size.</p>
Image Acquisition	
Save and restore image acquisition settings and image enhancement settings	If this option is activated, the Camera Explorer will save the previous settings for the Image Acquisition Tab and the Image Enhancement Tab available in the Basic Mode profile.

Save and restore chunk control settings If this option is activated, the Camera Explorer will save the Chunk Control Settings of the camera.

Notice

Activating this option may lead to issues if the camera is used with some 3rd Party Software products.

Log view

Log feature changes Write a log message for each feature modification.

Log device event info When you activate this feature, all events activated by the respective camera as part of the *Event Control* feature are logged.

Notice

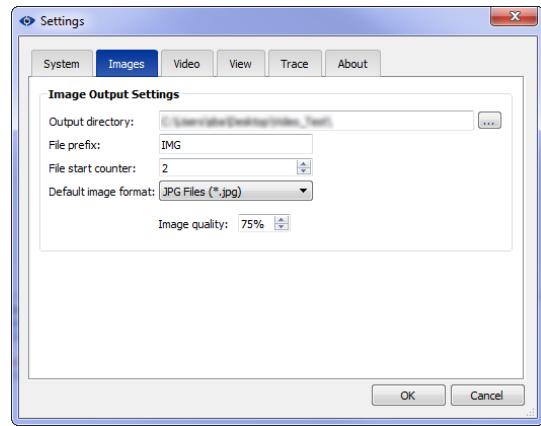
The Event Control feature is available for the GenICam Expert and *GenICam Guru* profiles.

Maximum number of log lines Here, you can set the maximum number of log lines. If the maximum is reached, the older log lines will be deleted.

Notice

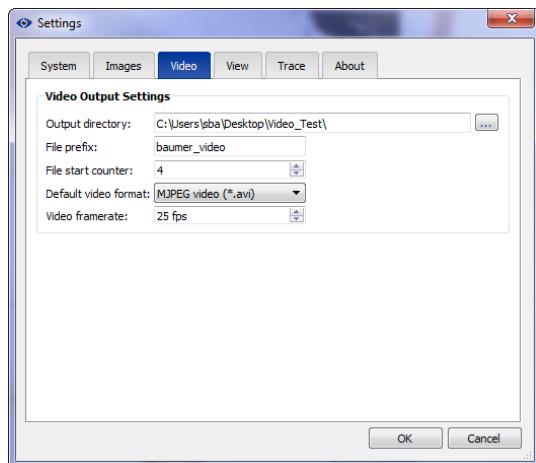
0 = unlimited log lines

Images



Function	Description
Image Output Settings	
Output directory	Choose the destination path for the snapshots and images captured with the <i>Image Recorder</i> .
File prefix	Set the prefix for the file name.
File start counter	File name start number for the first image. Will be appended to postfix of snapshot image file names.
Select the image format for the snapshots and the <i>Image Recorder</i> .	
*.jpg	With the *.jpg image format you have the extra option to set the image quality.
*.bmp	This image format has no extra options.
*.png	This image format has no extra options.
Default image format	With the *.tif image format, you have the extra option to adjust the bits per channel to 16 bit if the output format of the camera is > 8 bit.
	*.tif
*.webp	With the *.webp image format you have the extra option to set the image quality.
	*.brw
Image quality	With the *.brw image format, you have the extra option to adjust the <i>Default view Format</i> (RAW, RGB8, Mono8) and the option to save as compressed image.
	Set the image quality from 1 to 100%.

Video

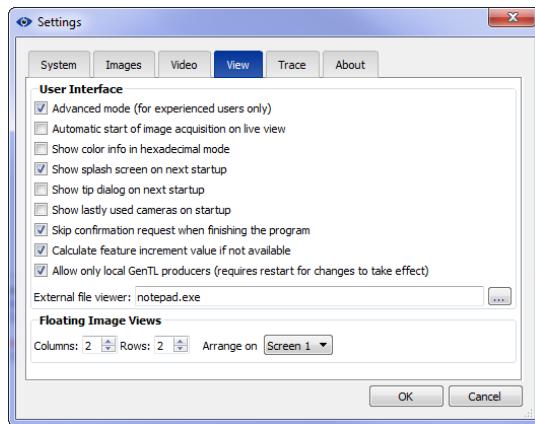


Notice

For the Video function OpenCL ≥ v1.2 required.

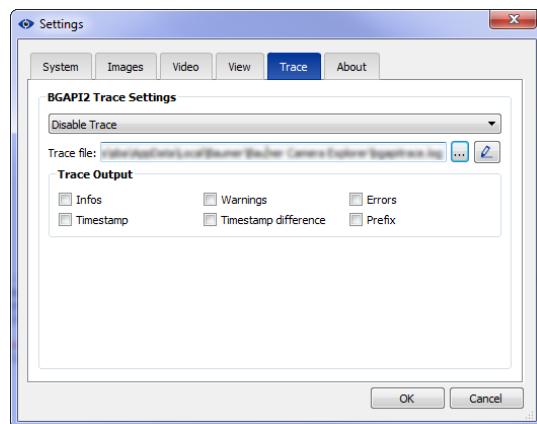
Function	Description
Video Output Settings	
Output directory	Choose the destination path for the videos captured with <i>Frame Capture</i> or <i>Image Recorder</i> .
File prefix	Set the prefix for the file name.
File start counter	File start counter will be appended to postfix video file name for saving of video files. Notice The file start counter will be ignored if the value is set to -1.
Select the video format for <i>Image Recorder</i> and <i>Frame Capture</i> .	
Default video format	MJPEG video *.avi The videos produced have an average file size.
	XVID video *.avi The generated videos have a small file size.
	I420 - YUV 4:2:0 *.avi The generated videos have a large file size.
	Video framerate Set the framerate for creation of video files.

View



Function	Description
Advanced mode (for experienced users only)	Enable additional functions for camera exploration.
Automatic start of image acquisition on live view	Enable automatic start of image acquisition on program start.
Show color info in hexadecimal mode	Show the color information in the <i>Status Bar</i> in hexadecimal format.
Show splash screen on next startup	Select when to start the software and whether the splash screen is enabled. If you turn off the view of the splash screen, you will see the initialisation in the System Status window instead.
Show tip dialog on next startup	If you activate this, the <i>Tip of the day...</i> is shown on the next startup [Alt]+[F1].
Show lastly used cameras on startup	The most recently used cameras will be shown on startup even if not accessible.
Skip confirmation request when finishing the program	Disable the query when closing the Camera Explorer.
Calculate feature increment value if not available	Calculate missing increment value for features of type double. Notice After activating this function SpinBoxes can also be displayed if there is no increment.
Allow only local GenTL producers (require restart for changes to take effect)	Allow only GenTL producers located in the start directory of the Camera Explorer. Disable this option to use all other producers found at Baumer GAPI initialization.
External file viewer:	Set a viewer for the camera's XML file or the trace file.
Floating Image View	
Columns	Select the number of columns for arranging the image views.
Rows	Select the number of rows for arranging the image views. Notice If the windows are too large, they will overlap.
Arrange on	Select the destination screen for arranging the image views.

Trace

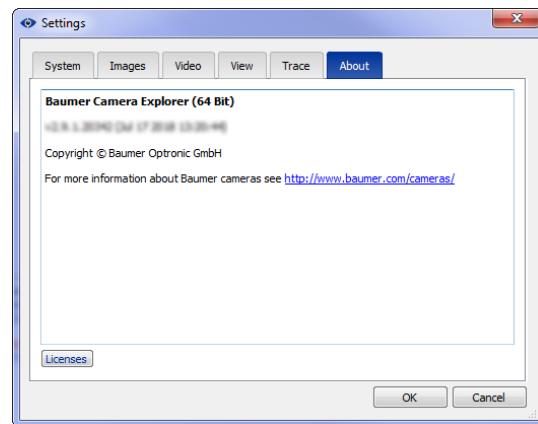


The Trace function allows you to monitor program execution. The following options are available.

Function	Description
BGAPI2 Trace Settings	
Disable Trace	No trace storing.
Trace to Debugger	Trace will be transferred to external debugger.
Trace to File	Trace is stored in the specified file.
Trace file	Select the path of the trace file.
	Show the trace file with the currently selected file viewer.
Trace Output	
Infos	Logging of general information. <div style="background-color: #0070C0; color: white; padding: 2px;">Notice</div> <div style="border: 1px solid black; padding: 2px;">This selection creates a high volume of data. Activate only when necessary.</div>
Warnings	Logging of warnings.
Errors	Logging of errors.
Timestamp	Logs the timestamp of every event.
Timestamp difference	Logs the interval from the last traced event to the current one.
Prefix	Shows the source (.dll) of the log entry.

About

This tab shows the program version and other information.



3.3.2 Help

You can open the help file within the program.

Icon	Description
	Click this button or [F1] to open the help file. Use [Alt]+[F1] to open the <i>Tip of the day</i>

3.3.3 Camera / Image area

The recognized cameras or open images are displayed here.

Cameras

In this area, the connected cameras are displayed with their model name, a status icon and the serial number. Start the *Camera View* by double clicking on the icon.

Cameras



◀ Figure 4

Camera area with an VCXG camera with full access

Meanings of the status icons shown as part of the camera icon.

Icon	Description
	Full access to the camera is available.
	Camera accessibility is limited. Features are shown but cannot be amended.
	Camera is not accessible.
	Device disabled. Other programs can use this device instead.
	Camera is in the wrong subnet. Double-click opens the <i>IP Config-Tool</i> .

Camera settings Dialog

To the right of the available cameras, there is the option button.

Icon	Description
	Click this button to open the options for the respective camera.
<div style="border: 1px solid black; padding: 10px;"><p><input type="checkbox"/> Open camera view automatically ×</p><p><input checked="" type="checkbox"/> Save and restore image acquisition settings and image enhancement settings</p><p><input type="checkbox"/> Disable device</p></div>	
Function	Description
Open camera view automatically	If this function activated, the respective <i>Camera View(s)</i> will be opened automatically when the Camera Explorer is next started. If only one camera is connected, a live image is displayed immediately, regardless of this option.
Save and restore image acquisition settings and image enhancement settings	If this option is activated, the Camera Explorer will save the previous settings for the Image Acquisition Tab and the Image Enhancement Tab available in the Basic Mode profile. Notice You can activate this function in the Program Settings. <i>Program Settings → System (Save and restore image acquistion settings and image enhancement settings)</i>
Disable device	Disable this device for further use. Other programs can use this device instead.

Images

The captured snapshots and the loaded images are displayed here. Their storage location will be shown as a tooltip. You can open an image in the *Image View* by double clicking it.

Remove the selected image with [Del].

Notice

Selected images are removed only from the GUI and remain in their storage location.

Images



◀ Figure 5

Image area with images

3.3.4 System Status Window / Log View

In this area, the program activities are shown in chronological order.

For example, you can access information about:

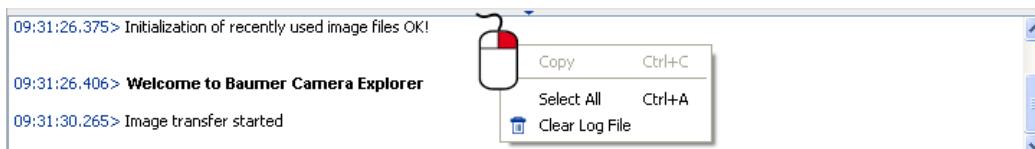
- starting procedure
- recognized cameras
- occurred errors
- used producers

The height of the area is adjustable, and it can be expanded and collapsed. This is marked with an identifier.

Notice

Settings for the *Log View* can be adjusted in *Program Settings* → *System*.

Right-click in this area to display different options.



◀ Figure 6

System Status window

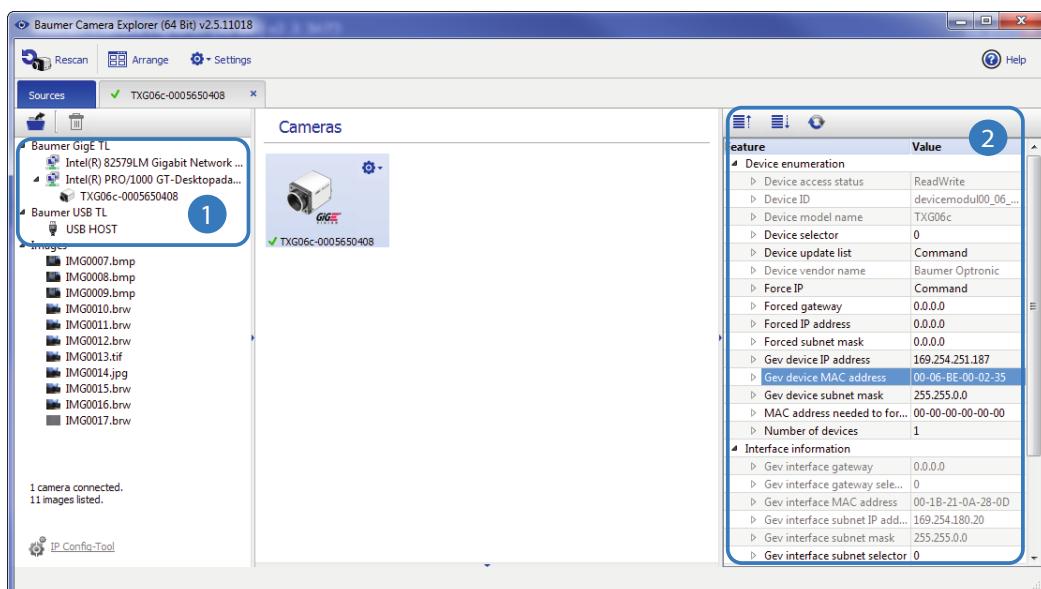
3.3.5 Main Class Features

Here, you have the option to adjust various features of the main classes (*System, Interface, Device*).

Notice

Function only available in *Advanced mode*. Activation: *Program settings* → *View*

To do this, click on *Source Tree* 1 on the desired object. The available features are now displayed in the *Main Class Features Tree* 2.



Producer (e.g. Baumer GigE TL) = Main Class *System*

Interface (e.g. Intel(R) PRO/1000 GT Desktop Adapter) = Main Class *Interface*

Device (e.g. TXG06c-0005650408) = Main Class *Device*

The features are displayed in the view property grid within their respective category.

Notice

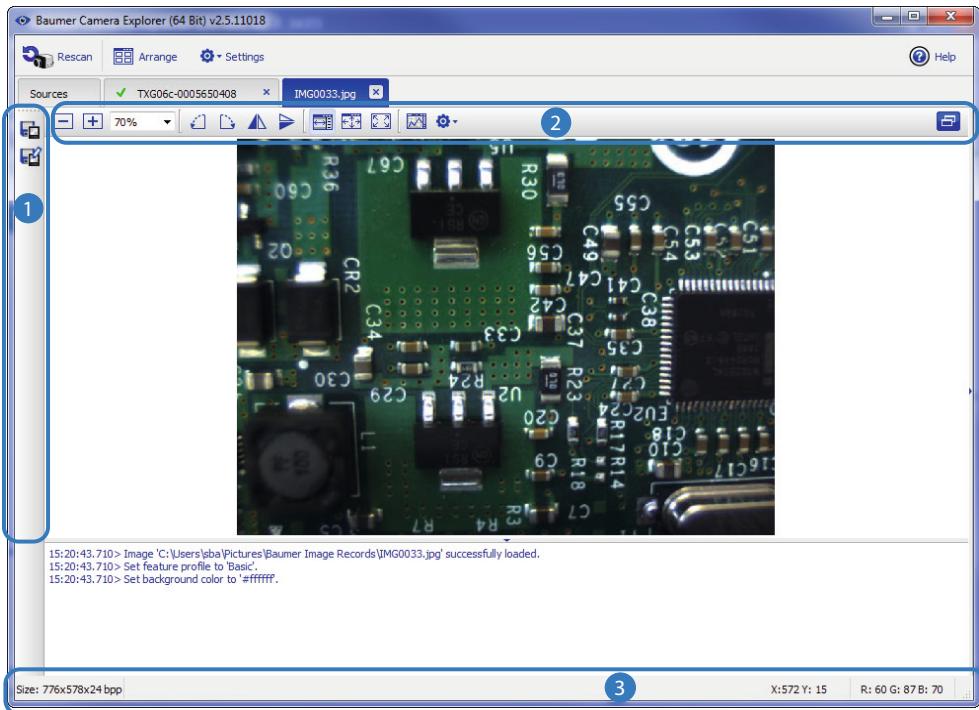
The features for the *Stream* main class are visible in the Feature Control Area with the profile set to *BGAPI Stream*.

This area shows the following icons with functions as described below:

Icon	Description
	Collapse all feature control categories.
	Expand all feature control categories.
	Refresh all feature values. [F5]
	You can use this function to set the width of the area. At a certain point, the area closes completely.

3.4 Image View

Each image will open in a separate tab. The tabs are separated into different areas. The content of the areas is described below.



- 1 Tool Bar
[see chapter 3.4.1](#)
 - 2 View Settings
[see chapter 3.4.2](#)
 - 3 Status Bar
[see chapter 3.4.3](#)

3.4.1 Tool Bar

Here, you have various options for storing the displayed image. The tool bar can be placed on all sides of the Camera Explorer or within the area.

Icon	Description
	Save current image to file.
	Save current image to new file.

Image Formats

Format	Description
*.jpg	normal jpg
*.bmp	normal bitmap graphic
*.png	normal portable network graphic
*.tif	8 bit / 16 bit images
*.jp2	images in jpeg2000 format
*.brw	special raw-format / only for Camera Explorer

3.4.2 View Settings

View Settings provides several options to manipulate the displayed image.

Double click on the image to open it in fullscreen mode. Zoom in using [Ctrl] + [mouse wheel].

Primary view settings

Icon	Description
	Zoom in / out.
	Manual enlargement input [Ctrl] + [mouse wheel]. Notice You can scroll in a zoomed image with [Alt] + [mouse], [shift] + [mouse].
	Rotate image by 90°.
	Vertical / horizontal mirroring of image view.
	Image view fit to window. [F2]
	Toggle maximized mode [F3]
	Activates fullscreen mode. Notice In fullscreen mode, you can zoom into/out of the image with [Ctrl] + [mouse wheel].
	Activate Diagram Tool, see chapter 3.6
	Open the tab as a separate window.

Figure 7 ►

Primary View settings icons

Secondary view settings

Icon	Description
	Open the secondary view setting layer.

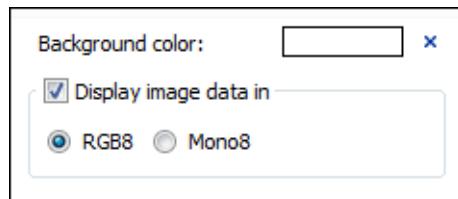
This has the following options:

- change background color
- disable / enable the converting of the image data and choose RGB8 or Mono8. (only .brw) [F6]

Notice

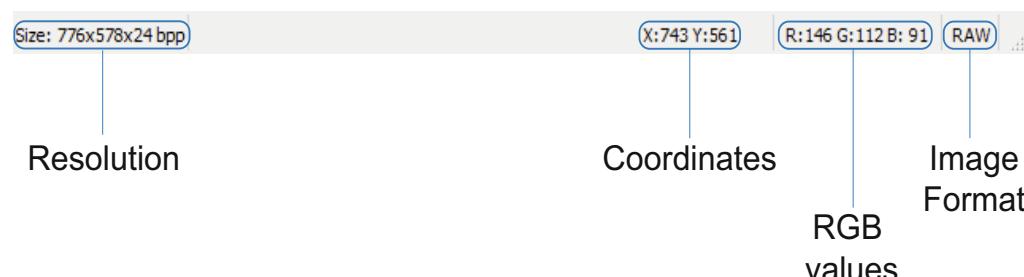
You can change the image format in the Program Settings.

Program Settings → Images (Default image format)



3.4.3 Status Bar

The status bar at the bottom of the Image View tab gives some information about the respective image.



◀ Figure 8

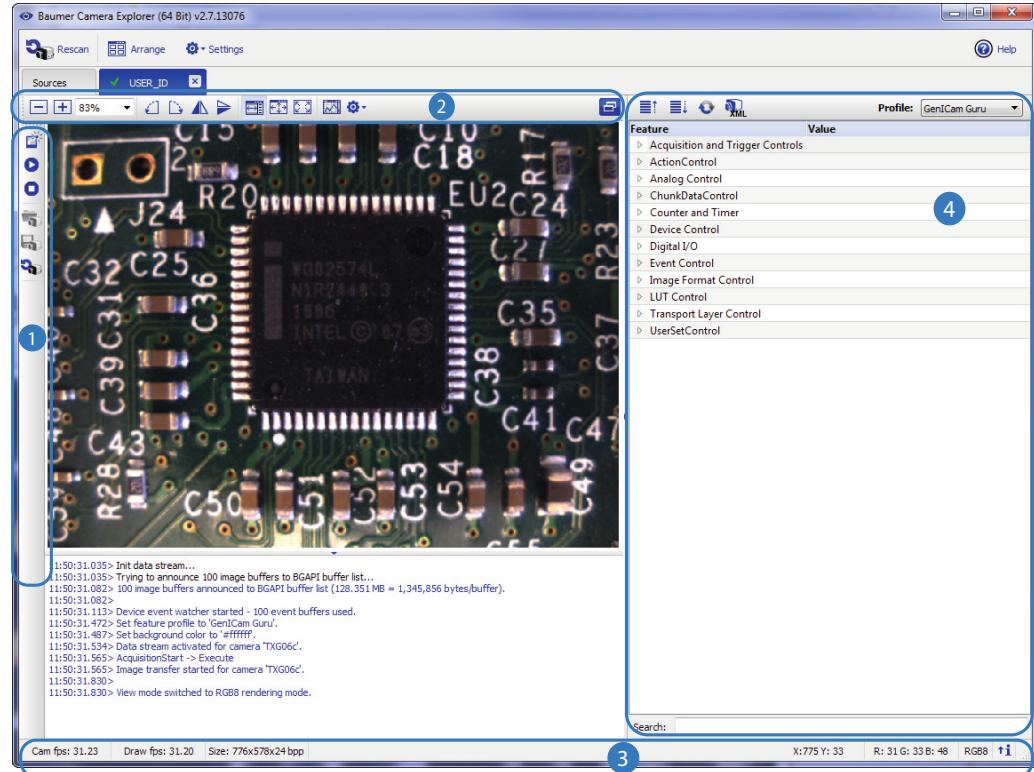
Status Bar image view

Information	Description
Resolution	Current resolution of the image.
Coordinates	Position of mouse cursor within the image.
RGB values	The Red Green Blue values for the current mouse position.
Image Format	<p>Shows the current view mode. Change with [F6].</p> <p>Notice</p> <p>The display format can be changed. <i>Program settings → View → Show color info in hexa-decimal mode</i></p>

3.5 Camera View

Each opened camera will be shown in a separate tab. The tabs are separated into different areas. The content of the areas is described below.

With [F6] you can show the image in raw mode.



1 Tool Bar
[see chapter 3.4.1](#)

2 View Settings
[see chapter 3.4.2](#)

3 Status Bar
[see chapter 3.4.3](#)

4 Feature control area
[see chapter 4](#)

3.5.1 Tool Bar

In the Tool Bar there are different icons with functions for image acquisition, loading and storing feature setting files and resetting the camera.

The tool bar can be placed on all sides of the Camera Explorer or within the area.

Icon	Description
	<p>Take a snapshot of the current image [F9].</p> <div style="border: 1px solid black; padding: 5px;"> Notice Settings for snapshots: <i>Program settings → Images / Output Settings</i> </div>
	<p>Start image acquisition [F12].</p> <div style="border: 1px solid black; padding: 5px;"> Notice Starting image acquisition locking all features which affect the payloadsize. </div>
	<p>Stop image acquisition [F11].</p>
	<p>You can use this function to load a feature setting file from the PC.</p> <div style="border: 1px solid black; padding: 5px;"> Notice Whether this feature is supported depends on the connected camera. </div>
	<p>Here, you can save a feature setting file to the PC. The feature setting file contains all adjusted values.</p>
	<p>With this function, you can reset all camera settings to the default <i>UserSet</i>.</p> <div style="border: 1px solid black; padding: 5px;"> Notice The camera will be reset to the <i>UserSet</i>, which is set by default in <i>UsersetControl → UserSetDefaultSelector</i>. </div>
	<p>Save current image permanently to camera.</p> <div style="border: 1px solid black; padding: 5px;"> Notice Whether this feature is supported depends on the connected camera. </div>
	<p>Show permanently stored image from camera.</p> <div style="border: 1px solid black; padding: 5px;"> Function only available in <i>Advanced mode</i>. Activation: <i>Program settings → View</i> </div>

◀ **Figure 9**
 Tool Bar icons and their functions

3.5.2 View Settings

View Settings provides several functions to manipulate the displayed image.

View Settings only changes the visualization of the Camera Explorer. Nothing is set on the connected camera.

Double click on the image to open it in fullscreen mode.

Primary view settings

Icon	Description
	Zoom in / out.
	Manual enlargement input [Ctrl] + [mouse wheel]. Notice You can scroll in a zoomed image with [Alt] + [mouse], [shift] + [mouse].
	Rotate image by 90°.
	Vertical / horizontal mirroring of image view.
	Image view fit to window. [F2]
	Toggle maximized mode [F3] Activates fullscreen mode.
	Notice In fullscreen mode, you can zoom into/out of the image with [Ctrl] + [mouse wheel].
	Activate Diagram Tool, see chapter 3.6 Open the tab as a separate window.

Figure 10 ►

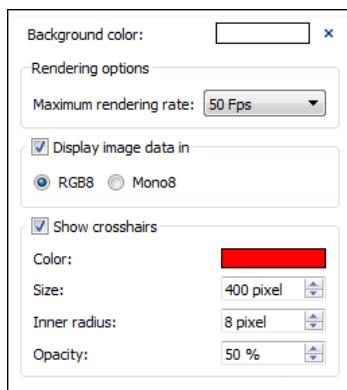
Primary View settings icons

Image view settings

Icon	Description
	Open the image view setting layer.

This layer has the following options:

- change background color
- enable rendering of the image and set the maximum rendering rate
- disable / enable the converting of the image data and choose RGB8 or Mono8 [F6]
- show crosshair (position can be adjusted)  and set size, color, radius of the circle as well as opacity



3.5.3 Status Bar

The status bar at the bottom of the camera tab gives additional information about the selected camera.

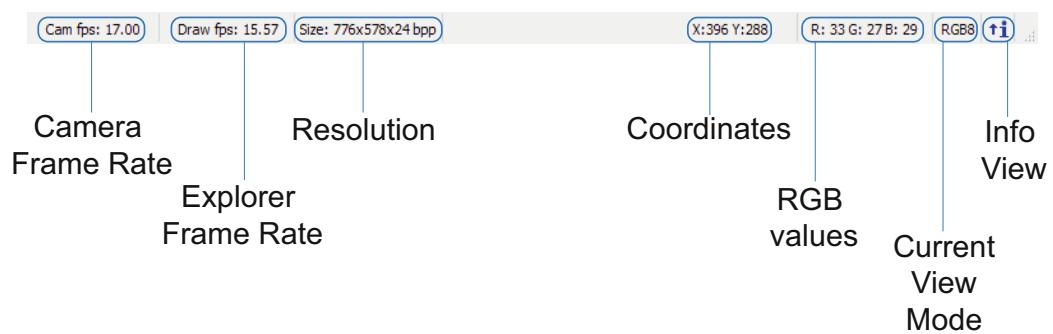


Figure 11 ▶

Status Bar / Camera View

Information	Description
Camera Frame Rate	Current frame rate of the camera (frames per second [fps])
Explorer Frame Rate	Current frame rate of the Explorer (frames per second [fps])
Resolution	Current resolution of the image.
Coordinates	Position of mouse cursor within the image.
RGB values	The Red Green Blue values for the current mouse position.
Notice <i>The display format can be changed. Program settings → View → Show color info in hex-decimal mode</i>	
View mode	Shows the current view mode [F6]
Info View	Open a layer with detailed information and help.

Info View

When you click on the in the status bar, the Info View opens. In the lower section, there are the two tabs *Info* and *Help*. On the tab *Info*, you can access additional information about the image and data transfer. Hover your mouse cursor over respective value to display brief information in the form of a tool tip.

On the tab *Help* you get information about the respective marked feature or category. For example, a description and the available values for features of type enumeration.

Icon	Description
	Expand all info categories.
	Collapse all info categories.
	Clear the values which are no longer required (e.g. values of chunk mode if deactivated).
	You can use this function to reset the values on the respective layer (e.g. counter).
	You can use this function to set the width of the area.
	At a certain point, the area closes completely.

Chunk Info (Tab Info)

Here you can access information about the chunk data. The content of the chunk depends on the connected camera.

Notice

Activating Chunk Mode

1. GigE cameras must first be stopped:
  or *Acquisition and Trigger Controls* → *Acquisition Stop* or [F 11]
2. Enable chunk mode:
Profile: GenICam Guru / ChunkDataControl → *Chunk Mode Active*
3. Re-start GigE camera:
  or *Acquisition and Trigger Controls* → *Acquisition Start* or [F 12]

Activating the *Auto Exposure* function also activates the *Chunk Mode* function. If *Auto Exposure* is then deactivated, *Chunk Mode* remains active.

Info View	
Feature	Value
▶ Chunk Info	
▶ Chunk Binning Horizontal	1
▶ Chunk Binning Vertical	1
▶ Chunk Black Level	0.000000
▶ Chunk Black Level Selector	All
▶ Chunk Device Temperature	58.000000 °C
▶ Chunk Exposure Time	50.000000 µs
▶ Chunk Frame ID	230328
▶ Chunk Gain	1.000000
▶ Chunk Gain Selector	All
Info	Help

Example content (depends on the connected camera)

Information	Description
Chunk Info	
Chunk Binning Horizontal	Number of binned pixel horizontal.
Chunk Binning Vertical	Number of binned pixel vertical.
Chunk Black Level	Black Level is used to capture the image.
Chunk Black Level Selector	Select which black level to retrieve data from.
Chunk Device Temperature	Temperature of the device.
Chunk Exposure Time	Exposure time of the current image.
Chunk Frame ID	Unique identifier of the feature.
Chunk Gain	Gain used to capture the image.
Chunk Gain Selector	Type of gain.

Event Info (Tab Info)

Here you can access information about the event data.

Notice
Activating Event Info
1. Event selection: <i>Profile GenICam Guru / Event Control → Event Selector / e.g. ExposureStart, FrameEnd, ExposureEnd</i>
2. Activation: <i>Profile GenICam Guru / Event Control → Event Notification / On</i>

Info View	
Feature	Value
▷ Chunk Info	
◀ Event Info	
◀ ExposureStart	
▷ Event ExposureStart Counter	156377
▷ Event Exposure Start	0x9000
▷ Event Exposure Start Timestamp	345306642360
◀ FrameEnd	
▷ Event FrameEnd Counter	20134
▷ Event Frame End	0x9003
▷ Event Frame End Timestamp	345306651640
◀ FrameTransferSkipped	
▷ Event FrameTransferSkipped Counter	5774
▷ Event Frame Transfer Skipped	0x9011
▷ Event Frame Transfer Skipped Timestamp	345271178880
Info	Help

Example content (depends on the connected camera)

Information	Description
ExposureStart	
Event ExposureStart Counter	Number of received ExposureStart events.
Event Exposure Start	Unique Identifier of event.
Event Exposure Start Timestamp	Timestamp of the event.
FrameEnd	
Event FrameEnd Counter	Number of received FrameEnd events.
Event FrameEnd	Unique Identifier of event.
Event Frame End Timestamp	Timestamp of the event.
FrameTransferSkipped	
Event FrameTransferSkipped-Counter	Number of received FrameTransferSkipped events.
Event Frame Transfer Skipped	Unique Identifier of event.
Event Frame Transfer Skipped Timestamp	Timestamp of the event.

Statistics Info (Tab Info)

Feature	Value
▷ Chunk Info	
▷ Event Info	
⚠ Statistics Info	
△ Buffer	
Current ID	153792
Current State	OK
Drawn	46134
Incomplete	0
Received	153791
Timestamp	26m:52s:236ms
Underruns	0
△ Stream	
▷ StreamStatisticBufferManagement	
▷ StreamStatisticDataBlock	
▷ StreamStatisticMaintenance	
▷ StreamStatisticPacket	

Example content (depends on the connected camera)

Information	Description
Buffer	
Current ID	ID of the current image.
Current State	Current State
Drawn	Number of drawn images.
Incomplete	Number of resend packets.
Received	Number of received images.
Timestamp	Timestamp of the current image.
Underruns	Number of images discarded due to unavailable buffer.
<div style="background-color: #0070C0; color: white; padding: 2px;"> Notice </div> Set the number of buffers: <i>Program settings → System / Frame Buffer per View</i>	
Stream	
StreamStatistics-BufferManagement	
State Buffer Insufficient Buffer Size	Statistic count attempt copy data from packet into a too small available buffer, buffer size too small.
State Buffer Underrun	Statistic count for data block window size overflow, count packets with old datablock id.
StreamStatistic-DataBlock	
Data Block Complete	Statistic count for complete received data blocks.
Data Block Missing	Statistic count for missed data blocks.
StreamStatistic-Maintenance	
Bitrate	Calculated bitrate bandwidth.
Throughput	Calculated fpf throughput.
StreamStatistic-Packet	
Packet Status Error	Statistic count for received packets with status error.
Packet Status Success	Statistic count for received packets with status success.

Help (Tab Help)

On the tab *Help* you get information about the respective marked feature or category. For example, a description and the available values for features of type enumeration.

The screenshot shows a software interface with a feature tree on the left and a detailed description on the right. A blue arrow points from the 'Timer Trigger Source' entry in the tree down to its corresponding description in the details panel.

Counter And Timer Control

Frame Counter	2
Timer Delay	0.000000 µs
Timer Duration	10.000000 µs
Timer Selector	Timer 1
Timer Trigger Activation	Rising Edge
Timer Trigger Source	Off

Timer Trigger Source

Selects the source of the trigger to start the Timer.

The following values are possible:

Action1:	Starts with the assertion of the chosen action signal.
ExposureEnd:	Starts with the reception of the Exposure End.
ExposureStart:	Starts with the reception of the Exposure Start.
FrameTransferSkipped:	
Line0:	Starts when the specified TimerTriggerActivation condition is met on the chosen I/O Line.
Off:	Disables the Timer trigger.
Software:	Starts when the trigger was generated by the software.
TriggerSkipped:	Starts when a trigger was skipped.

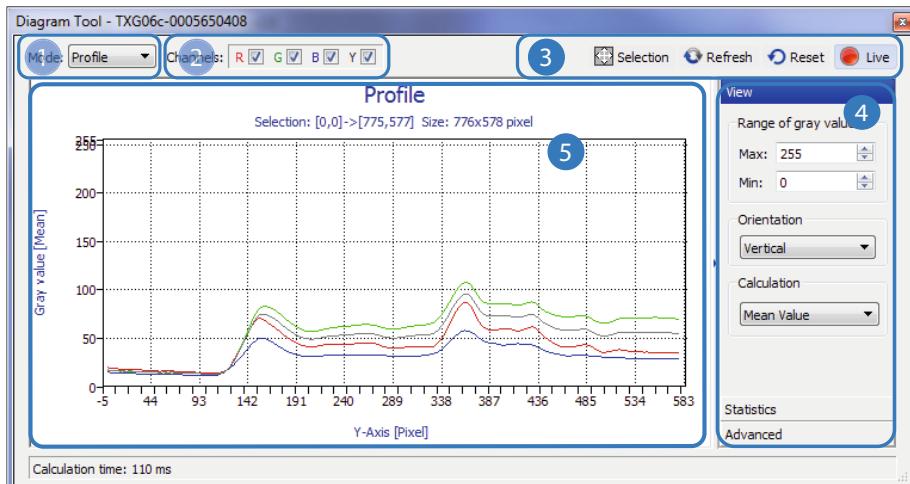
Info Help

Example content (depends on the marked feature, category and camera)

Information	Description
Marked Feature / Category	The feature or category marked in the feature tree.
Description	Description of the marked feature or category.
Possible Values	If values are selectable for the marked feature, they are displayed here.

3.6 Diagram Tool

With the diagram tool, you can analyze the profile and the histogram of captured images, live images and selected areas in images.



- | | |
|---|---|
| <p>1 Mode
see chapter 3.6.1</p> <p>2 Channels
see chapter 3.6.2</p> <p>3 Selection / Refresh / Reset / Live
see chapter 3.6.3</p> | <p>4 View /Statistic / Advanced
see chapter 3.6.4.</p> <p>5 Diagram
see chapter 3.6.5</p> |
|---|---|

3.6.1 Mode

Function	Description
Profile	Evaluation of the image profile. Notice The type of calculation (Mean Value, Center Line) can be selected under View.
Histogram	Frequency distribution for the selected channels.

3.6.2 Channels

Function	Description
R	Red components of image
G	Green components of image
B	Blue components of image
Y	Brightness of image

3.6.3 Selection / Refresh / Reset / Live

Function	Description
Selection	A selected area in the image is analyzed.
Refresh	Refresh values with data from current image.
Reset	Reset the diagram settings.
Live	Show live diagram. The values are constantly updated. Notice Function is only available in the Camera View and not with captured image.

3.6.4 View / Statistics / Advanced

View

Function	Description
Range of gray values	Set the maximum for the axes of the diagram here.
Orientation	<i>Horizontal:</i> The entire image / marked area is analyzed horizontally. <i>Vertical:</i> The entire image / marked area is analyzed vertically. Notice Function is only available in the Mode <i>Profile</i> .
Calculation	<i>Mean Value:</i> The entire image / marked area is analyzed in the selected orientation. <i>Center Line:</i> The image / marked area is analyzed centrally in the selected orientation. The orientation is marked with a yellow line in the image / marked area, if you selected this under <i>Advanced</i> → <i>Show center line</i> . Notice Function is only available in the Mode <i>Profile</i> .

Statistics

Function	Description
Channel	Here for each selected channel (Red, Green, Blue, Brightness) values are displayed.

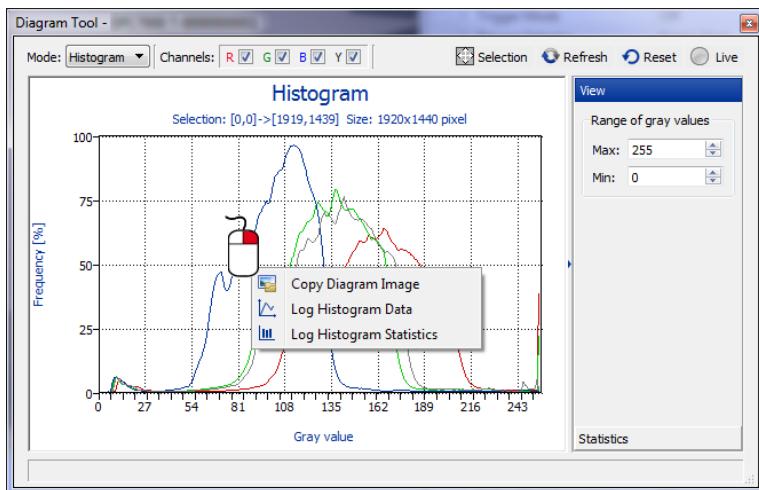
Advanced

Function	Description
Show tooltip	Show tooltip info inside the diagram area.
Show center line	Show center line for profiles when calculated.

3.6.5 Diagram

In the diagram, the determined values are displayed graphically.

Hover your mouse cursor over the diagram to display brief information in the form of a tool tip.

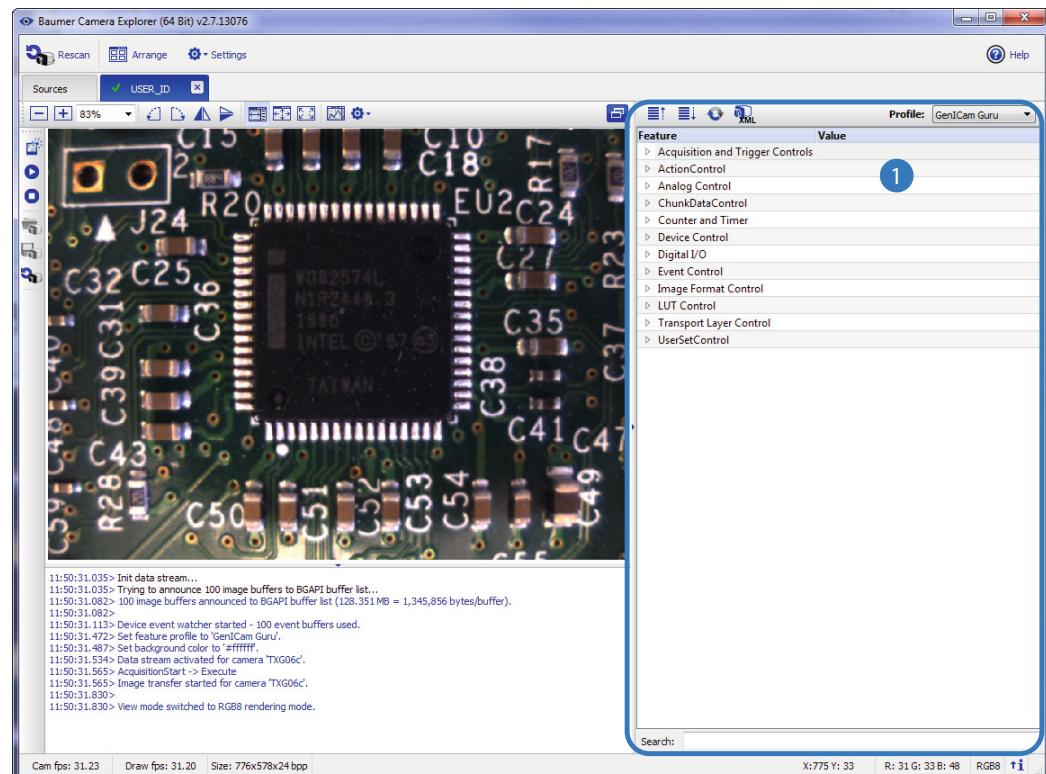


Right-click in this area to display different options.

Function	Description
Copy Diagram Image	Copies the diagram as an image for further use in the memory.
Log Histogram Data	Writes the currently determined values (Histogram / Profile) in the System Status Window / Log View.
Log Histogram Statistics	Writes the currently determined statistic values (Histogram / Profile) in the System Status Window / Log View.

4. Feature Control Area

Feature Controls provides several functions for parametrization of the camera. These settings will be stored in the camera.



1 Feature Control Area

4.1 Feature View Icons

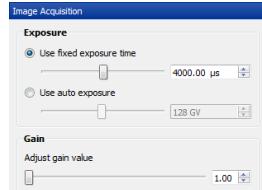
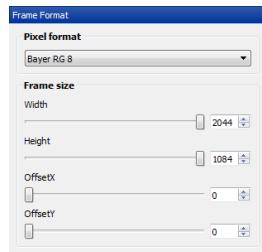
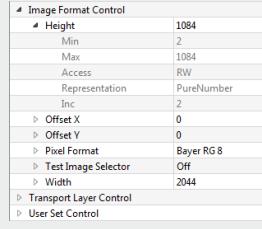
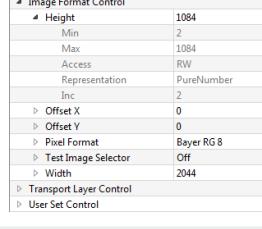
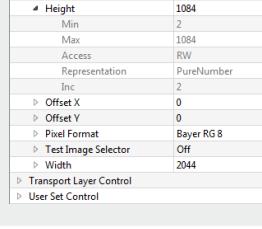
The icons at the top of the feature window have the following functions:

Icon	Function
	Expand all feature control categories.
	Collapse all feature control categories.
	Refresh all feature values. [F5]
	[Ctrl] + [click on icon] to toggle between feature name and display name. View the camera configuration file. Notice Function only available in <i>Advanced mode</i> . Activation: <i>Program settings</i> → <i>View / Advanced mode</i> You can set your own external viewer to show the camera configuration files. <i>Program settings</i> → <i>System / External Viewer</i>
	Select a user defined set of features. This selection can be saved for every camera and is loaded automatically. Notice This function is only available in the <i>GenICam User</i> profile.
	You can use this function to set the width of the area. At a certain point, the area closes completely.
	Search for feature names or feature display names.

4.2 Profiles

You can choose between seven different profiles. You can use the combobox to choose your desired profile or [F4] to switch between profiles.

The differences between the profiles are the number of categories, the view and the number of features.

Profile	Description	Screenshot
Basic	<p>Choose this profile to configure basic functionality.</p> <p>This profile will display the features in one column.</p> <p>Auto Exposure Function Using the Basic Profile</p> <p>Exposure time is set automatically to reach the pre-set average gray value (GV) across the entire image.</p> <p>Notice</p> <p>The <i>Use auto exposure</i> feature depends on the connected camera.</p> <p>Activating the <i>Auto Exposure</i> function also activates the <i>Chunk Mode</i> function. If <i>Auto Exposure</i> is then deactivated, <i>Chunk Mode</i> remains active.</p>	 
GenICam Beginner	<p>This profile provides the most frequently used features.</p> <p>The features in this profile are displayed in the view property grid within their respective category.</p>	
GenICam Expert	<p>This profile offers more functionality than the Beginner profile.</p> <p>The features in this profile are displayed in the view property grid within their respective category.</p>	
GenICam Guru	<p>This profile provides maximum functionality. It will display all possible settings.</p> <p>The features in this profile are displayed in the view property grid within their respective category.</p>	

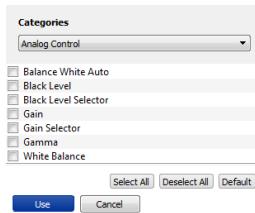
GenICam User

Within this profile you have the option to define your own feature selection.

Click on the pen icon  and choose a category to select the features.

Press **Use** to apply your selection.

This selection is saved for every camera and is loaded automatically when you connect the camera.

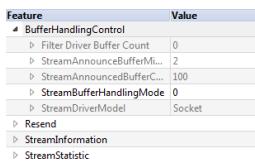
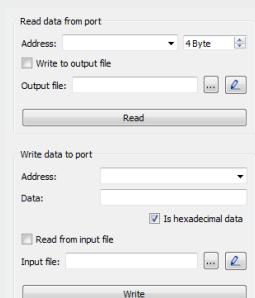


Main Class Profiles

Notice

These profiles are only available in Advanced Mode:

Activation: *Program Settings → View / Advanced mode (for experienced users only)*.

Profile	Description	Screenshot
BGAPI Stream	<p>This profile provides you with the features of the <i>main class BGAPI Stream</i>.</p> <p>The features in this profile are displayed in the view property grid within their respective category.</p>	
Port Interface	<p>Enables read and write of camera addresses.</p> <p>Furthermore, it is possible to read address contents from a file or to write to a file.</p> <p>Notice</p> <p>Inappropriate changes may impair operation or even render the camera unusable. For this reason, a password must be assigned.</p>	

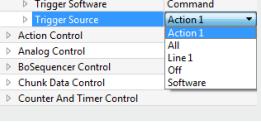
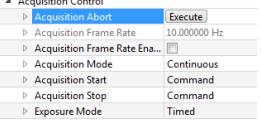
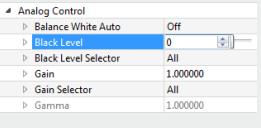
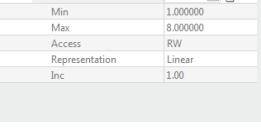
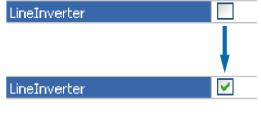
4.3 Feature Interaction

The features of the profiles *GenICam Beginner*, *GenICam Expert*, *GenICam Guru* and *GenICam User defined* follow the GenICam standard and are shown in the property grid. In the property grid, the current values of the features are permanently displayed in columns.

Hover your mouse cursor over the feature value to display brief information in the form of a tool tip. When you click on the  in the status bar, the Info View opens. On the tab Help you get information about the respective marked feature. For example, a description and the available values for features of type enumeration.

To make changes, click on the value and, depending on the type of feature, a graphical element opens. Changes can also be made via the keyboard.

Some features correlate with each other and will be immediately updated. To change some features some cameras may need to be stopped. (Stop - [F11], Start - [F12])

Feature Types	Description	Screenshot
Strings	<p>In the Strings feature type, you can enter a value into a text box.</p> <p>Changes are effective immediately without confirmation.</p>	
Enumeration	<p>In the Enumeration feature type, you can choose a value from a selection in the form of a drop-down list.</p>	
Command	<p>Execution of selected features only.</p> <p>To execute the feature click on the respective button.</p>	
Integer	<p>In the Integer feature type, you can enter a value into a text box for some features or you can adjust the value using a variable slider.</p> <p>Identifier text boxes require hexadecimal value entry.</p>	
Float	<p>In the Float feature type, you can enter a value into a text box for some features or you can adjust the value using a variable slider.</p>	
Boolean	<p>In features in the Boolean feature type, you can choose in a check box whether the feature is enabled or not.</p>	

4.4 Categories

In the *GenICam Beginner*, *GenICam Expert* and *GenICam Guru* profiles, the features are divided into categories. When you select a category in this area, an associated feature tree is opened.

Depending on the selected profile and the connected camera, the categories and their features differ in number.

Notice

All standard features are described in "GenICam Standard Features Naming Convention". The standard is downloadable for free at: www.emva.org.

Some examples of features are shown in the table below.

Category	Examples of features in the category
DeviceControl	DeviceVendorName, DeviceModelName, DeviceID, ...
ImageFormatControl	Width, Height, OffsetX, OffsetY, PixelFormat, ...
AcquisitionControl	AcquisitionStart, AcquisitionStop, ExposureTime, ...
DigitalIOControl	LineSelector, LineMode, LineSource, ...
CounterAndTimerControl	FrameCounter, TimerDelay, CounterReset, ...
EventControl	EventSelector, EventNotification, EventSoftwareData, ...
AnalogControl	Gain, Gamma, WhiteBalance, ...
LUTControl	DefectPixelCorrection, DefectPixelListIndex, ...
TransportLayerControl	GevInterfaceSelector, GevNumberOfInterfaces, ...
UserSetControl	UserSetSelector, UserSetLoad, UserSetSave, ...
ChunkDataControl	ChunkModeActive, ChunkSelector, ChunkFrameID, ...
ActionControl	ActionDeviceKey, ActionGroupMask, ActionGroupKey, ...
HDRControl	HDREnable, HDRIndex, ...

5. Further Functions

Notice

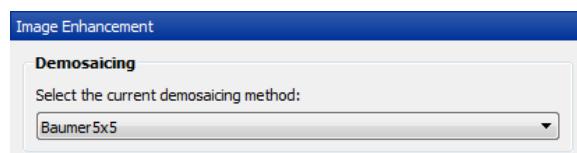
These further functions are only available in the *Basic* profile.

5.1 Image Enhancement

5.1.1 Demosaicing

A demosaicing algorithm is a digital image process used to reconstruct a full color image from the incomplete color samples output from an image sensor overlaid with a color filter array.

With this function you can influence the algorithm.



The following options are available:

- Baumer 5x5
- Bilinear 3x3
- NearestNeighbor

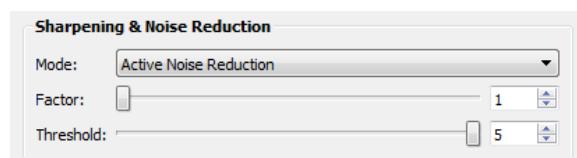
5.1.2 Sharpening & Noise Reduction

Here you have different options to influence the sharpness and the noise of the images.

Notice

Sharpening is only available if the demosaicing method is set to *Baumer 5x5* and if the current pixel format is supported.

Only Bayer and mono pixel formats are supported!



The following options are available:

- Off
- Global Sharpening
- Adaptive Sharpening
- Active Noise Reduction

5.1.3 Color Correction

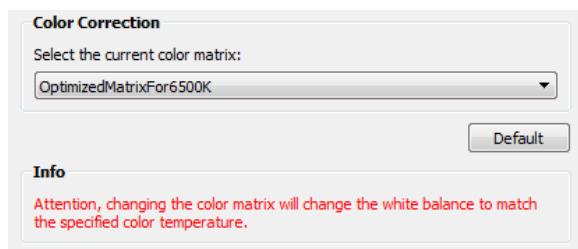
Here you can set a another color matrix.

Notice

You must stop the image acquisition to switch the active color matrix.

Notice

Changing the color matrix will also change the white balance to match the specified color temperature.



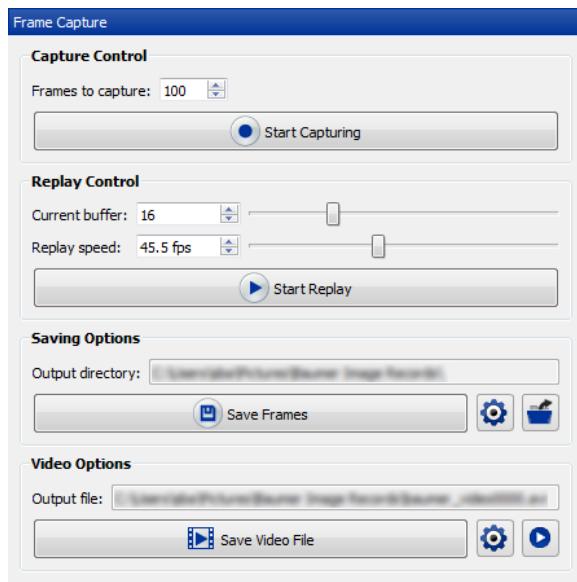
The following options (color matrices) are available:

- No color correction
- OptimizedMatrixFor3000K
- OptimizedMatrixFor6500K

Icon	Description
Default	Reset all Image Enhancement settings to default values.

5.2 Frame Capture

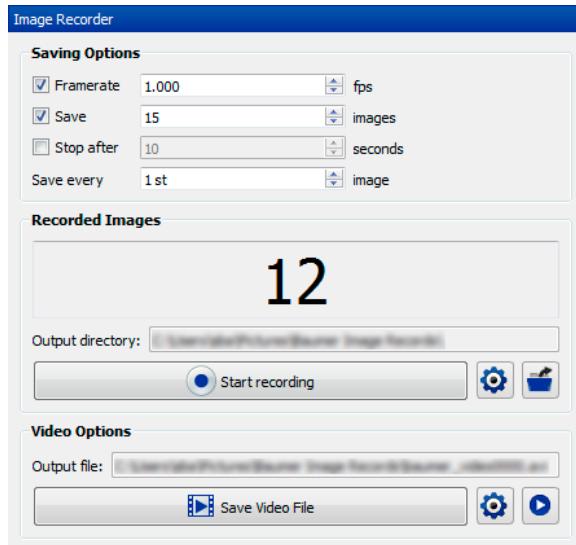
Capture frames / videos with several conditions.



Function	Description
Capture Control	
Frame to capture:	Select the number of frame buffers for next frame capturing.
Start / Stop Cap-turing	Start / Stop Frame capturing into memory buffers.
Replay Control	
Current buffer:	Select the frame to show.
Replay speed:	Select the replay frame rate.
Start / Stop Re-play	Start / Stop the replay of the captured frames.
Saving Options	
Output directory:	Shows the output directory for the captured images.
Save Frames	Save captured frames to the selected output directory.
	Change output directory and image format settings.
	Open the output directory to show the saved frames.
Video Options	
Notice	
At least 10 images must have been captured in order to use this function.	
Output file:	Shows the output directory / file name for the captured video file.
Save Video File	Save captured frames to video file.
	Change output directory and video format settings.
	Start playing the saved video file with a external video player.

5.3 Image Recorder

Record images / videos with several conditions.



Function	Description
Saving Options	
Framerate	Set camera frame rate for saving. Notice If this function is grayed out, the camera is in Trigger Mode. <i>Acquisition and Trigger Controls → TriggerMode</i>
Save	Limit the number of images to save.
Stop after	Limit the number of seconds to save per image.
Save every	Skip saving of images by defining an image save interval.
Recorded Images	
Recorded Images	12 Number of recorded images.
Output directory:	Shows the output directory for the recorded frames.
Start / Stop recording	Start / Stop frame recording to new sub directory.
	Change output directory and image format settings.
	Open the output directory with last recorded images.
Video Options	
Notice	
At least 10 images must have been recorded in order to use this function.	
Output file:	Shows the output directory / file name for the video file.
Save Video File	Save recorded images to video file.
	Change output directory and video format settings.
	Start playing the saved video file with a external video player.

6. Support

In the event of any questions, or for troubleshooting, please contact our support team.

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