MIPI CSI-2, GigE Vision, and USB3 Vision Cameras

Alvium

Features Reference

V2.9.1

FW 00.12.00.00611a22

This document at a glance

Read this document carefully

Learn to avoid damage to your camera and use it in the most safe and efficient way.
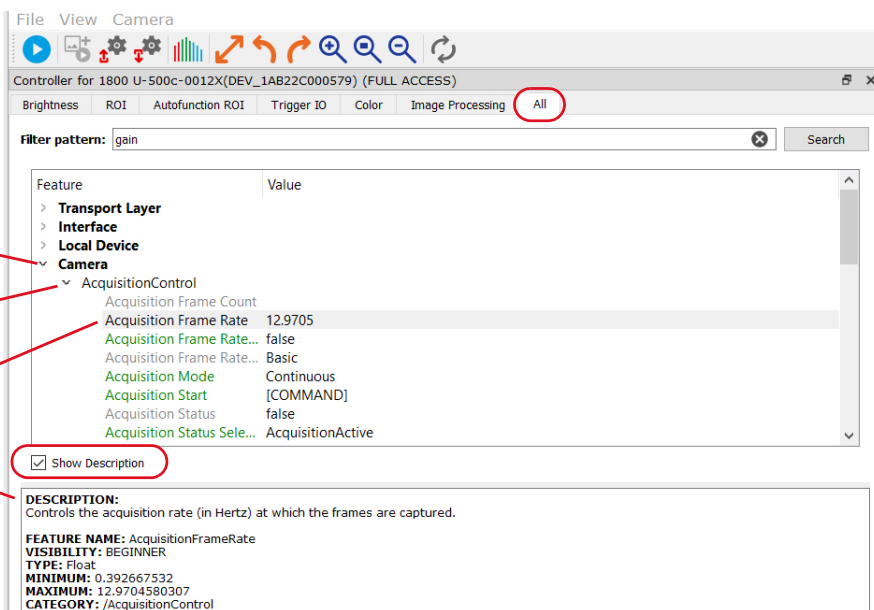
Features with Vimba X

Categories and features in this reference are organized as in the **Vimba X Viewer**. Order and visibility can be different on third party viewers.

Previous Vimba Viewer only displayed some transport layer features. **With Vimba X Viewer**, all transport layer features are displayed. In the viewer's feature tree, the features are categorized by the corresponding GenTL module. The node **Camera** contains all camera features, while the nodes **Transport Layer**, **Interface**, **Local Device**, and **Stream 0** contain the transport layer features.

Finding features

Camera firmware features can be found in the **Camera** GenTL Module of **Vimba X Viewer**. Transport layer features can be found in the other GenTL Modules. (These groups can differ when third party transport layers are used.) In this document, the included categories and features are listed in alphabetical order.

We recommend you to check **Show Descriptions in Vimba X Viewer** as shown in Figure 1. The **All** tab is selected to show the feature tree. You can search for features using the search bar in **Vimba X Viewer**. You can easily search for features in this document using the Index on page 289.

Figure 1: Features listed in the All tab of Vimba X Viewer

Differences in features and values

Features described in this document may not be supported by every Alvium model. Value ranges may differ between models as well.

GenICam for CSI-2 Access is supported for Alvium 1800 C models, please see the Alvium CSI-2 Cameras User Guide for details.

`ActionControl` features are supported only by Alvium GigE cameras.

`MultipleRegionControl` features are supported only by Alvium GigE and USB cameras with Sony IMX global shutter sensors.

`SequencerControl` features are supported only by Alvium GigE and USB cameras with Sony IMX global shutter sensors.

`TransferControl` features for image acquisition in burst mode are supported only by Alvium GigE cameras. Support for the other Alvium series is technically impossible.

What else do you need?

This is a selection of helpful links:

Download or topic	Link
Alvium camera documentation and application notes	www.alliedvision.com/en/support/technical-documentation
Vimba X SDK for Windows, Linux, and Linux/ARM, including **Vimba X Viewer**, **Firmware Updater**, and **Driver Installer** for Windows	www.alliedvision.com/en/products/software/vimba-x-sdk
Firmware downloads	www.alliedvision.com/en/support/firmware-downloads
Technical support	www.alliedvision.com/en/support

Table 1: Helpful links

Contact us

Website, email

General

www.alliedvision.com/en/contact
info@alliedvision.com

Distribution partners

www.alliedvision.com/en/avt-locations/avt-distributors

Support

www.alliedvision.com/en/support
www.alliedvision.com/en/about-us/contact-us/technical-support-repair-/-rma

Offices

Europe, Middle East, and Africa (Headquarters)

Allied Vision Technologies GmbH
Taschenweg 2a
07646 Stadtroda, Germany
T// +49 36428 677-0 (Reception)
T// +49 36428 677-230 (Sales)
F// +49 36428 677-28

Asia-Pacific

China

Allied Vision Technologies
(Shanghai) Co., Ltd.
2-2109 Hongwell Int. Plaza
1602# ZhongShanXi Road
Shanghai 200235, China
T// +86 21 64861133

Singapore

Allied Vision Technologies Asia Pte. Ltd
82 Playfair Rd, #07-01 D'Lithium
Singapore 368001
T// +65 6634 9027

North, Central, and South America

Canada

Allied Vision Technologies Canada Inc.
300 – 4621 Canada Way
Burnaby, BC V5G 4X8, Canada
T// +1 604 875 8855

USA

Allied Vision Technologies, Inc.
102 Pickering Way- Suite 502
Exton, PA 19341, USA
Toll-free// +1-877-USA-1394
T// +1 978 225 2030

Contents

Document history and conventions

This chapter includes:

Document history

Version	Date	Document updates
V2.9.1	2023-Jun-16	• Updated graphic in Image data flow on page 31. • Added GigE support for `TestPendingAck` in TestControl on page 243.
V2.9.0	2023-Jun-07	**Firmware version**: 00.12.00.00611a22 • Updated version for supported GigE Vision Standard from 1.2 to 2.2. • Removed entry for document V2.7.1 in this list that stated the support of `TestPattern`. This information was wrong and still is. Therefore, this document never included descriptions for this feature. • Adjusted document structure to match Vimba X Viewer. This includes: - Added information related to What else do you need? on page 3. - Added Feature descriptions: Transport Layer on page 35. - Added Feature descriptions: Interface on page 55. - Added Feature descriptions: Local Device on page 77. - Renamed previous "Feature descriptions" to Feature descriptions: Camera on page 90. - Added Feature descriptions: Stream 0 on page 262. - Moved categories from previous "Feature descriptions" to new "Feature descriptions..." chapters. **Note**: You can find categories and features in Contents on page 5 and PDF bookmarks, or in Index on page 289. - Removed contents about Config mode for IP settings. - Updated diagrams in Notes on feature description on page 30 for multiple regions. • Updated information in Differences in features and values on page 3. • Updated origin of feature for selected features in Feature descriptions: Camera on page 90. Continued on next page.

Table 2: Document history (Sheet 1 of 6)

Version	Date	Document updates
V2.9.0	2023-May-24	Continued from previous page. • Removed unit from `CounterDuration` in [CounterAndTimerControl](#) on page 135. • Changed interface support for `LineDebounceDuration` and `LineDebounceMode` in [DigitalIOControl](#) on page 166. • Added `SerialTxLock` to [SerialHub (subcategory)](#) on page 172. • Added *Sensor* option to `BinningSelector` in [ImageFormatControl](#) on page 185. • Added [MultipleRegionControl (subcategory)](#) on page 196. • Added LUTValueAll in [LUTControl](#) on page 220. • Removed `LUTEnable` from affected features and aligned the corresponding lists between `SequencerSelector` and `SequencerSetLoad` in [SequencerControl](#) on page 230. • Removed plural S for `StatFrame`... and `StatPacket`... features in [Stream](#) on page 266 and [StreamInformation](#) on page 284. • Applied editorial changes.
V2.8.1	2022-Nov-14	Updated the title image.
V2.8.0	2022-Oct-27	**Firmware version**: 00.11.00.9cf0c21e • Updated standard references in [Standards referred to in this document](#) on page 26. • Updated [Pseudo code example](#) on page 167 for `SequencerControl`. • Updated options for `TriggerSource` in [AcquisitionControl](#) on page 28, for `TimerTriggerSource` in [CounterAndTimerControl](#) on page 75, for `LineSource` in [DigitalIOControl](#) on page 106, and for `SequencerTriggerSource` in [SequencerControl](#) on page 166. • Added features support for [ActionControl](#) on page 43 by Alvium G1 cameras. • Added options for `DeviceTemperatureSelector` in [DeviceControl](#) on page 89. • Added Line Debounce features in [DigitalIOControl](#) on page 106. Continued on next page.

Table 2: Document history (Sheet 2 of 6)

Version	Date	Document updates
V2.8.0	2022-Oct-27	Continued from previous page. • Removed **ChunkDataControl** category. • Added Counter features to CounterAndTimerControl on page 75. • Updated options for SoftwareSignalSelector on page 178. • Added TransferControl on page 202 for burst image aquisition. • Applied editorial changes.
V2.7.2	2022-Jul-20	• Added notes that **ActionControl** features are not working properly on Alvium G1 cameras yet.
V2.7.1	2022-Jul-15	**Firmware versions** • Alvium CSI-2, G5, USB: 00.10.6c9062b1 • Alvium G1: 00.10.00.2cf3b22e **Applied changes** • Added options for **TriggerSource** in AcquisitionControl on page 28. • Added feature support for Alvium G5 in: – ActionControl on page 43 – GVCP (subcategory) on page 128 – PtpControl on page 159. • Added feature support for Alvium USB cameras in **ChunkDataControl**. • Added options for **TimerTriggerSource** in CounterAndTimerControl on page 75. • Added support for all Alvium cameras and reorganized features in SerialHub (subcategory) on page 112. • Added options to **FileSelector** in FileAccessControl on page 117. • Added TestPattern in ImageFormatControl on page 134. • Added features in SequencerControl on page 166. • Added features in SoftwareSignalControl on page 177. • Removed **ColorTransformationSelector** from ColorTransformationControl on page 66. Applied editorial changes.

Table 2: Document history (Sheet 3 of 6)

Version	Date	Document updates
V2.7.0	2022-Jun-09	**Firmware versions** • Alvium CSI-2, G5,USB: 00.08.00.6727174b • Alvium 1500 C-050, C-120, C-210, C-500, and 1800 C-500: 00.08.01.13f227a4 • Alvium G1: 00.09.00.45ce470f **Applied changes** • Added support for Alvium G1 and G5 models. • Added features in ActionControl on page 43. (Currently available for **Alvium G1 only**) • Added features in SerialHub (subcategory) on page 112. (Currently available for **Alvium G1 only**) • Added features in GVCP (subcategory) on page 128. (Currently available for **Alvium G1 only**) • Added features in PtpControl on page 159. (Currently available for **Alvium G1 only**) • Updated diagrams in AcquisitionControl on page 28 for GigE cameras. • Applied editorial changes.
V2.6.1	2022-Mar-28	Added *Timer0Active* and *Timer1Active* options for `LineSource`.
V2.6.0	2022-Mar-21	**Firmware version**: 00.08.00.6727174b • Added support for selected Alvium 1800 C models. • Updated diagrams in AcquisitionControl on page 28 for convolution filters. • Added the `CounterAndTimerControl` category. • Added `AcquitisitonFrameRateMode`, `ExposureActiveMode` and `SensorBitDepth`. • Added features to control convolution filters in the `ImageProcessingControl` category. • Added individual options *UserSet1* to *UserSet4* and descriptions to the `UserSetControl` category. • Added features that are specific to MPI CSI-2, including the subcategories `StreamInformation/Statistics` and `TransportLayerControl/Info`. • Applied editorial changes.

Table 2: Document history (Sheet 4 of 6)

Version	Date	Document updates
V2.5.0	2021-Dec-07	**Firmware version**: 00.07.00.81db3896 • Updated diagrams in AcquisitionControl on page 28 for new LUT and Sharpness features. • Added descriptions for `Sharpness`, `TriggerDelay`, and LUT features. • Removed descriptions for `ContrastConfigurationMode`. • Added information on using `ExposureMode`.
V2.4.1	2021-Sep-22	• Removed *FitRange* option from `IntensityControllerAlgorithm`.
V2.4.0	2021-Aug-04	**Firmware version**: 00.06.00.35992 • Updated Figure 2: Image data flow for Alvium cameras on page 31. • Added feature descriptions for `BinningHorizontal`, `BinningHorizontalMode`, `BinningSelector`, `BinningVertical`, `BinningVerticalMode`, and `DevicePowerSavingMode`. • Applied editorial changes.
V2.3.0.	2021-Apr-07	**Firmware version**: 00.04.00.34658 • Added feature descriptions for `DeviceLinkCommandTimeout`, `DeviceTLVersionMajor`, `DeviceTLVersionMinor`, `TimestampLatch`, `TimestampLatchValue`, `TimestampReset`. • Applied editorial changes.
V2.2.0	2020-Nov-13	**Firmware version**: 00.03.00.31919 • Added descriptions in AcquisitionControl on page 28. • Added *User* option to `CorrectionSet` and `CorrectionSetDefault` for defect pixel correction. • Applied editorial changes.
V2.1.2	2020-Jun-05	Corrected naming for the `IntensityAutoPrecedence` feature.
V2.1.1	2020-Mar-12	Removed notes for features previously enabled.
V2.1.0	2020-Feb-13	• Added contents for maximum values for contrast features. • Added `ShutterMode` to the feature descriptions.

Table 2: Document history (Sheet 5 of 6)

Version	Date	Document updates
V2.0.0	2020-Jan-07	**Firmware version**: 00.01.02.28100 • Added descriptions for `Contrast`, `Gamma`, `Hue`, `Saturation` features, and *ExposureActive* option for `TriggerSelector`. • Reorganized feature categories. • Added information on related selectors. • Reorganized introduction chapters. • Corrected typographical errors.
V1.0.3	2019-Sep-05	Applied editorial changes.
V1.0.2	2019-Jul-08	Applied editorial changes.
V1.0.1	2019-Jul-05	Applied editorial changes.
V1.0.0	2019-Jul-01	Associated firmware version: 00.01.00.26405 Release version

Table 2: Document history (Sheet 6 of 6)

Conventions used in this document

To give this document an easily understandable layout and to emphasize important information, the following typographical styles and symbols are used:

Styles

Style (example)	Function
Emphasis	Some important parts or items of the text are emphasized to make them more visible.
`Features names`	Features names are displayed as monospaced text.
`Features options`	Features options and values that are selectable by the user are displayed as monospaced italicized text.
`Non-standard features options`	Marked with superscript ([1]) are features that complement the features defined in the SFNC.
`InputCommand`	Text or command to type in by the user, selected menu options, or other selectable options.
`SourceCode`	Code words, such as for programs, used in running text. Mainly designated for use in software documentation.
UIElement	Text that is displayed, or output, by the system for the user, like parts of the GUI, dialog boxes, buttons, menus, important information, or windows titles.
WebReference	References to other documents or webpages, like weblinks, hypertext links, or emails.

Table 3: Markup conventions used in this reference

Symbols and notes

Practical tip

Additional information helps to understand or ease handling the camera.

Additional information

Web address or reference to an external source with more information is shown.

Avoiding malfunctions

Precautions are described.

Access

Acronym	Meaning
R/W	Feature is read/write.
R/(W)	Feature is readable, and it may be read/write, depending upon the user privilege level.
R/C	Feature is read-only and constant.
R	Feature is read-only and may change.
ROI	Region of interest
W	Feature is write-only.

Table 4: Abbreviations used in this reference

Standards referred to in this document

The document describes in alphabetical order the basic and advanced camera controls for Allied Vision Alvium cameras as seen from Vimba Viewer.

These features comply with the following standards:

- GigE Vision Standard Version 2.2
- USB3 Vision Standard Version 1.1
- GenICam Standard Document Version 2.1.1
- GenICam Standard Features Naming Convention (SFNC) Version 2.7
- GenICam Pixel Format Naming Convention (PFNC) Version 2.2
- GenICam Transport Layer Standard Features Naming Convention (GenTL SFNC)
    - CSI-2: Version 1.2.0
    - GigE: Version 1.1.1
    - USB: Version 1.0.0
- GenICam Generic Control Protocol (GenCP) Version 1.3

Downloads of applied common standards

For SFNC, GenTL SFNC, and GenCP, see www.genicam.org
For USB3 Vision and PFNC, see www.visiononline.org

Allied Vision custom features

Some features in this document are adapted SFNC features. Some features are custom features adding new functions to the features range defined by the SFNC. See Acronyms and terms on page 27.

Acronyms and terms

Abbreviation/term	Meaning
Custom	Non-SFNC features that are adding to new functions to the existing SFNC feature definitions
GenTL SFNC	GenICam Transport Layer Standard Features Naming Convention
GenTL SFNC adapted	Features that deviate from the GenTL SFNC definition
GEV	GigE Vision Standard
SFNC	GenICam Standard Features Naming Convention
SFNC adapted	Features that deviate from the SFNC definition
U3V	USB3 Vision Standard

Table 5: Standards used in this reference

Description scheme

This document is organized from GenTL Modules down to categories and features, in alphabetical order. For the structure in **Vimba X Viewer**, see Finding features on page 2.

The features in this reference are described according to the following formatting scheme.

Category name

First-level item, always starting a new page. Short description of category, including individual characteristics, and showing the Feature type as *(Category)*.

Subcategory

Second-level item. Short description of subcategory, including individual characteristics, and showing the Feature type as *(Category)*.

Feature

[Selector]

Second-level or third-level item. Short description of feature, including individual characteristics and possible values, and showing the full Category path.

Features availability

Some features are available for one camera interface only. Other features differ between camera interfaces. `AcquisitionFrameCount` is supported for all interfaces. If a feature is supported for some interfaces only, the Interface support is stated.

AcquisitionFrameCount

Controls the number of frames to acquire in *MultiFrame* acquisition mode.

Interface support	All
Display name	Acquisition Frame Count
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	(number)
Affected features	Not applicable
Category	/AcquisitionControl

Selectors

Some features have multiple instances. For these features, Selector features define which instance of the feature is accessed.

Example: the `LineInverter` feature, used to invert internal signal polarity, can be applied to all input and output lines of the camera. The line is selected by the `LineSelector` feature.

The headline for the feature description is `LineInverter[LineSelector]`, according to the C programming language convention for arrays: a pair of brackets follows the feature name, like in `SelectedFeature[Selector]`.

Invalidators

Some features have opposing functions. For example, `Sharpness` enhances edge contrast while `Blur` reduces edge contrast. Therefore, when `Sharpness` is enabled, `Blur` is automatically disabled. Feature descriptions provide an additional row for opposing features, called **Affected features**.

Copyright and trademarks

Notes on feature description

This chapter includes:

Image data flow

To develop your application effectively, note the order in which the features are processed in Alvium cameras.

In the Alvium user guides, the image data flow describes the sequence of image processing steps inside the camera. The shown functionalities represent features or feature groups.
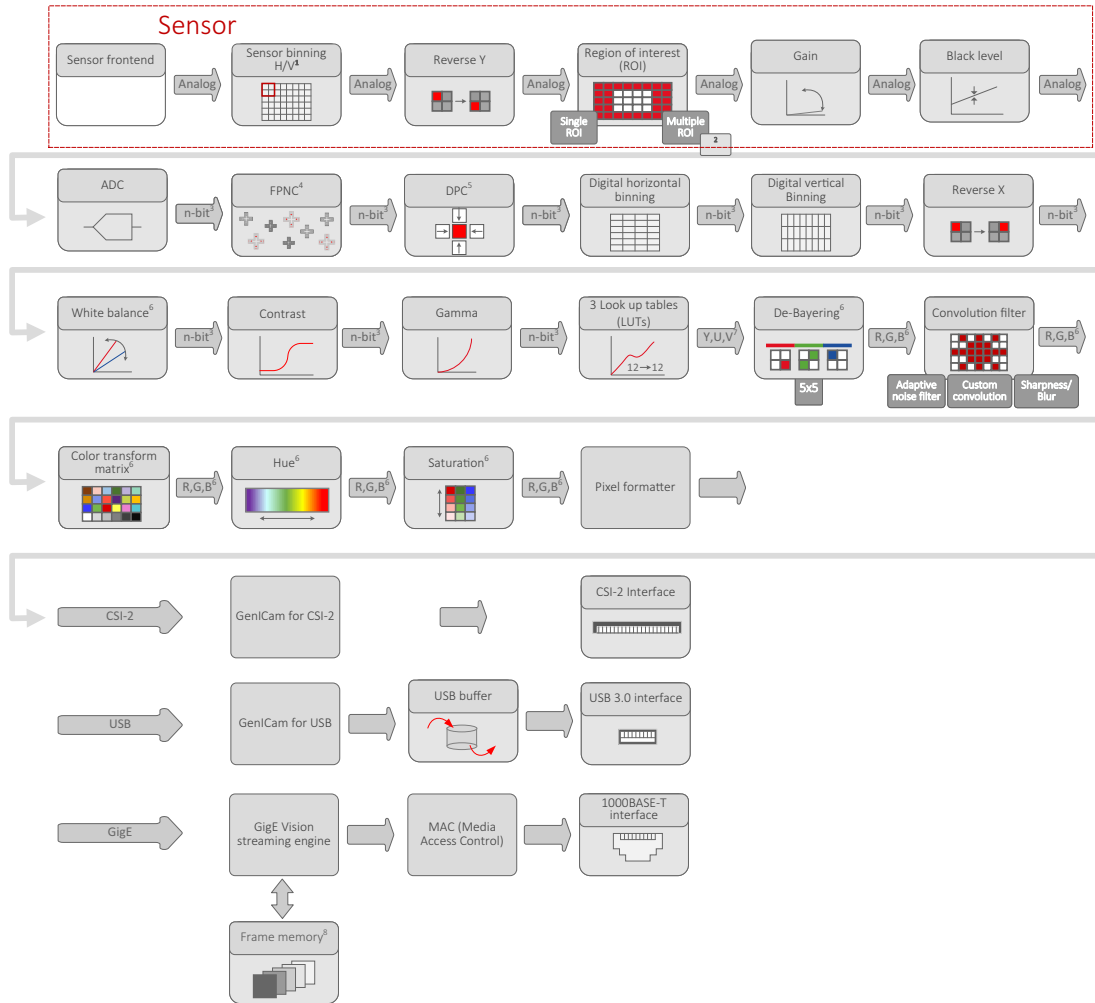
[1] Selected monochrome models only: See your Alvium camera's user guide.

[2] Selected models only: See your Alvium camera's user guide.

[3] Model dependent: See ADC bit depths stated in your Alvium camera's user guide.

[4] Factory preset for FPNC = Fixed Pattern Noise Correction. For model availability, see your Alvium camera's user guide.

[5] Factory preset for DPC = Defect pixel correction

[6] Color models only

[7] For monochrome models: Y only

[8] Referred to as **Image buffer** in the feature descriptions.

Figure 2: Image data flow for Alvium cameras

Feature interdependencies

The conversion between time and clock cycles affects control values. Features for pixel format, bandwidth, ROI, exposure time, and triggering are related to each other. Changing values for one feature can change values for another feature. For example, frame rates can be reduced when `PixelFormat` is changed subsequently. Figure 3 shows the interdependencies.
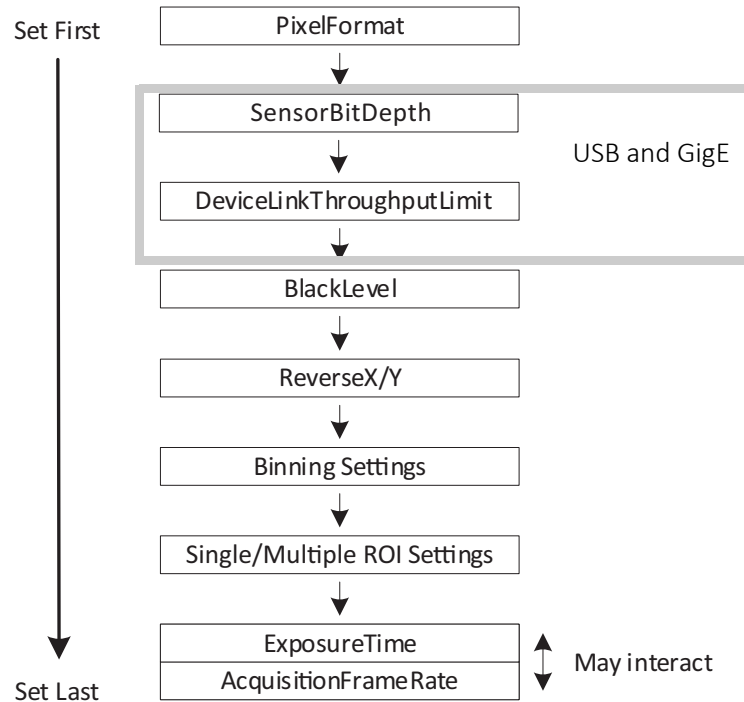
Figure 3: Interdependencies between features

Regions of interest and auto mode regions

Multiple regions

See descriptions in MultipleRegionControl (subcategory) on page 196.

Generally, auto mode regions are areas or regions on the image, where measurements are done to be used by various auto-features, for example measurement of the intensity for auto-exposure control.

The features used to define area of regions of interest (ROIs) and auto mode regions are displayed in Figure 4.
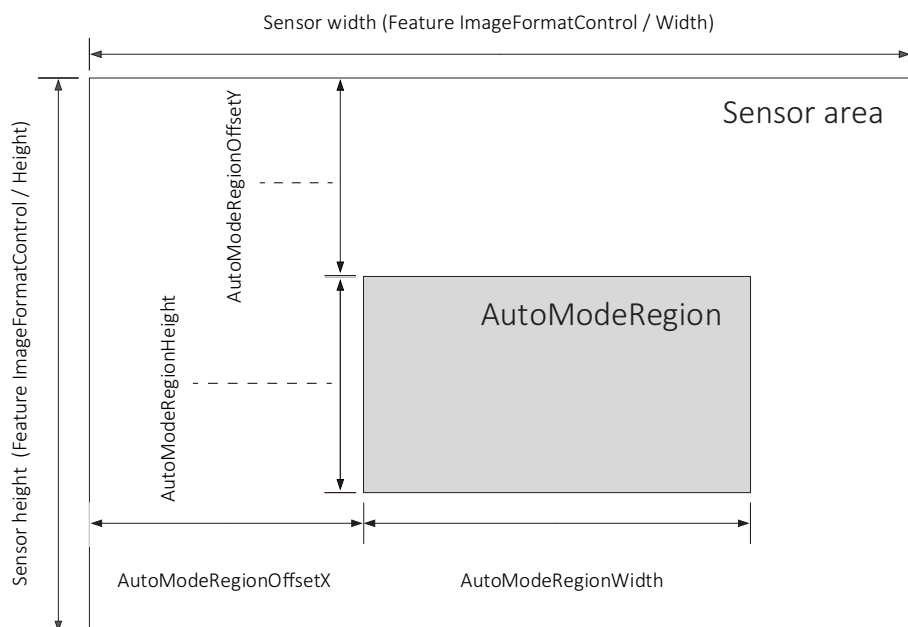
Figure 4: auto mode region and ROI measurement features

It is possible to have multiple auto mode regions. Also, multiple sensor-ROIs are supported that are called DisplayROI in this document. A DisplayROI covers the area that is being transmitted by the camera subsystem.

The interaction of auto mode regions and ROIs would allow for a huge variety of possibilities. However, the actual interaction is limited to a few useful possibilities that practically make sense.

Basic rules

- Auto mode regions must be explicitly enabled by a feature.
- One auto mode region inside a ROI is permitted. This provides a fixed correlation between ROI and auto mode region.

- Auto mode region and ROI coordinates are absolute to the sensor area. If the ROI position is changed, the position of the auto mode region is maintained. The auto mode region represents the content changed by shifting the ROI.
- The auto mode region must be inside the respective ROI.
- If auto mode regions are enabled, the position and size are set to the same position and size of the respective ROI. This means that disabling and re-enabling the auto mode regions resets their positions and sizes.
- If ROI is changed, auto mode region may need to be adjusted. To do so, **set the position before you set the size**.

  Therefore, as long as the origin of the auto mode region remains inside the ROI, the position and size of the auto mode region can be maintained.

  To ensure no part of the auto mode region is outside the ROI, the size of the auto mode region is adjusted until the minimum allowed size is reached. Only then the position may be altered.

ROI and auto mode region effects

Auto mode region is always treated as a subset of ROI. The following scenarios show the interaction between ROI and auto mode region and gives recommendations where auto mode region settings can be improved. Vice versa, you can adjust settings for ROI to match an existing auto mode region.
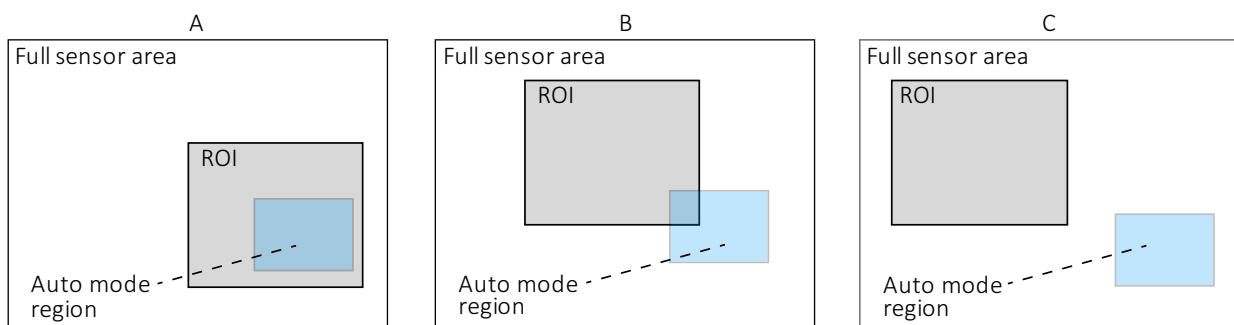
Figure 5: ROI and auto mode region effects

A. **Scenario**: User input creates an auto mode region included by a larger ROI.
   Result: Camera logic applies no changes to the selected auto mode region. The complete auto mode region is effective.
B. **Scenario**: User input creates a common area between ROI and auto mode region is only small.
   Result: Camera logic reduces the effective auto mode region to the common area between auto mode region and ROI.
   Recommendation: Relocate and resize auto mode region to become a subset of or to match ROI.
C. **Scenario**: User input creates ROI and auto mode region that have no common area.
   Result: Camera logic reduces the effective auto mode region to 0.
   Recommendation: Relocate and resize auto mode region to become a subset or to match ROI.

Allied Vision

Feature descriptions: Transport Layer

This chapter includes:

ActionControl

The features in this category can be used to send (scheduled) action commands to GigE cameras.

Interface support	GigE
Display name	Action Control
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

ActionCommand

Sends an action command.

Interface support	GigE
Display name	Action Command
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Command
Access	W
Affected features	Not applicable
Category	/ActionControl

ActionDeviceKey

Controlss the device key for an action command to be sent.

Note: This parameter must have the same value for all devices in a group.

Interface support	GigE
Display name	Action Device Key
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum value
4294967295	Maximum value

ActionGroupKey

Controls the group key for an action command to be sent.

Note: This parameter must have the same value for all devices in a group.

Interface support	GigE
Display name	Action Group Key
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum value
4294967295	Maximum value

ActionGroupMask

Controls the group mask for an action command to be sent.

Note: This parameter must have the same value for all devices in a group.

Interface support	GigE
Display name	Action Group Mask
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum value
4294967295	Maximum value

ActionScheduledTime

Controls the time in a time-enabled action command.

Interface support	GigE
Display name	Action Scheduled Time
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum value
9223372036854775807	Maximum value

ActionScheduledTimeEnable

Enables or disables time-enabled action commands.

Interface support	GigE
Display name	Action Scheduled Time Enable
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Boolean
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
True	Scheduled action command are enabled.
False	Scheduled action commands are disabled (default).

GevActionDestinationIPAddress

Controls the IP address for an action command to be sent.

Interface support	GigE
Display name	Gev Action Destination IP Address
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum value
4294967295	Maximum value

SystemInformation

The features in this category can be used to display versions of the used GenTL and GenTL SFNC, and to identify the GenTL Producer.

Interface support	All
Display name	System Information
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

GenTLSFNCVersionMajor

Displays the major version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer's XML.

Interface support	USB
Display name	Gen TL SFNC Version Major
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
-9223372036854775808	Minimum value
9223372036854775807	Maximum value

GenTLSFNCVersionMinor

Displays the minor version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer's XML.

Interface support	USB
Display name	Gen TL SFNC Version Minor
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
-9223372036854775808	Minimum value
9223372036854775807	Maximum value

GenTLSFNCVersionSubMinor

Displays the sub minor version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer's XML.

Interface support	USB
Display name	Gen TL SFNC Version Sub Minor
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
-9223372036854775808	Minimum value
9223372036854775807	Maximum value

GenTLVersionMajor

Displays the major version number of the GenTL specification the GenTL Producer implementation complies with.

Interface support	All
Display name	Gen TL Version Major
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
0	Minimum value
4294967295	Maximum value

GenTLVersionMinor

Displays the minor version number of the GenTL specification the GenTL Producer implementation complies with.

Interface support	All
Display name	Gen TL Version Minor
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
0	Minimum value
4294967295	Maximum value

GevVersionMajorNumber

Displays the major version number of the GigE Vision specification the GenTL Producer implementation complies to.

Interface support	GigE
Display name	Gev Version Major Number
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
-9223372036854775808	Minimum value
9223372036854775807	Maximum value

GevVersionMinorNumber

Displays the minor version number of the GigE Vision specification the GenTL Producer implementation complies to.

Interface support	GigE
Display name	Gev Version Minor Number
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
-9223372036854775808	Minimum value
9223372036854775807	Maximum value

TLDisplayName

Displays the user readable name of the GenTL Producer.

This features corresponds to the TL_INFO_DISPLAYNAME command of TLGetInfo function.

Interface support	All
Display name	TL Display Name
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

TLID

Displays the Unique identifier of the GenTL Producer like a GUID.

This feature corresponds to the TL_INFO_ID command of TLGetInfo function.

Interface support	All
Display name	TL ID
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

TLModelName

Displays the name of the GenTL Producer to distinguish different kinds of GenTL Producer implementations from one vendor.

This feature corresponds to the TL_INFO_MODEL command of TLGetInfo function.

Interface support	All
Display name	TL Model Name
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

TLPath

Displays the full path to the GenTL Producer driver including name and extension.

This feature corresponds to the TL_INFO_PATHNAME command of TLGetInfo function.

Interface support	All
Display name	TL Path
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

TLType

Displays the transport layer type of the GenTL Producer implementation.

Corresponds to the TL_INFO_TLTYPE command of TLGetInfo function.

Interface support	All
Display name	TL Type
Standard	Gen TL SFNC adapted
Origin of feature	Transport layer
Feature type	String
Access	Enumeration
Affected features	Not applicable
Category	/SystemInformation

Values	Description
Custom	MIPI CSI-2
GigEVision	GigE Vision
USB3Vision	USB3 Vision

TLVendorName

Displays the name of the GenTL Producer vendor.

This feature corresponds to the TL_INFO_VENDOR command of TLGetInfo function.

Interface support	All
Display name	TL Vendor Name
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

TLVersion

Displays the vendor specific version string.

This feature corresponds to the TL_INFO_VERSION command of TLGetInfo function.

Interface support	All
Display name	TL Version
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

CameraAddressForcing

This category contains system features to force access for cameras that are otherwise not detected.

Interface support	GigE
Display name	Camera Address Forcing
Standard	Custom
Origin of feature	Transport layer
Feature type	(Category)

GevDeviceForceGateway

Controls the gateway of the GEV camera to be forced.

Interface support	GigE
Display name	Gev Device Force Gateway
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/CameraAddressForcing

Values	Description
0	Minimum value
4294967295	Maximum value

GevDeviceForceIP

Sends the force address command on all interfaces.

Interface support	GigE
Display name	Gev Device Force IP
Standard	Custom
Origin of feature	Transport layer
Feature type	Command
Access	W
Affected features	Not applicable
Category	/CameraAddressForcing

GevDeviceForceIPAddress

Controls the IP address of the GEV camera to be forced.

Interface support	GigE
Display name	Gev Device Force IP Address
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/CameraAddressForcing

Values	Description
0	Minimum value
4294967295	Maximum value

GevDeviceForceMACAddress

Controls the 48-Bit MAC address of the GEV camera to force the IP setup.

Interface support	GigE
Display name	Gev Device Force MAC Address
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/CameraAddressForcing

Values	Description
0	Minimum value
9223372036854775807	Maximum value

GevDeviceForceSubnetMask

Controls the subnet mask of the GEV camera to be forced.

Interface support	GigE
Display name	Gev Device Force Subnet Mask
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/CameraAddressForcing

Values	Description
0	Minimum value
4294967295	Maximum value

InterfaceEnumeration

The features in this category can be used for interface enumeration of the system module.

Interface support	All
Display name	Interface Enumeration
Standard	Custom
Origin of feature	Transport layer
Feature type	(Category)

InterfaceCount

Displays the number of interfaces on the corresponding GenTL Producer.

Interface support	All
Display name	Interface Count
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/InterfaceEnumeration

InterfaceDisplayName

[InterfaceSelector]

Displays the user readable name of the selected interface.

Interface support	All
Display name	Interface Display Name
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/InterfaceEnumeration

InterfaceID
[InterfaceSelector]

Displays the GenTL Producer wide unique identifier of the selected interface.

Interface support	All
Display name	Interface ID
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/InterfaceEnumeration

GevInterfaceIPAddress
[InterfaceSelector]

Displays the IP address of the interface.

Interface support	GigE
Display name	Interface IP Address
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/InterfaceEnumeration

Values	Description
0	Minimum value
4294967295	Maximum value

GevInterfaceIPSubnetMask
[InterfaceSelector]

Displays the subnet mask of the interface.

Interface support	GigE
Display name	Interface IP Subnet Mask
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/InterfaceEnumeration

Values	Description
0	Minimum value
4294967295	Maximum value

GevInterfaceMACAddress
[InterfaceSelector]

Displays the 48-Bit MAC of the interface.

Interface support	GigE
Display name	Interface IP Subnet Mask
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/InterfaceEnumeration

Values	Description
0	Minimum value
9223372036854775807	Maximum value

InterfaceSelector

Selects the GenTL Producer interface.

Interface support	All
Display name	Interface Selector
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/InterfaceEnumeration

Values	Description
≥0	Value range

InterfaceUpdateList

Updates the interface list on this GenTL Producer.

Interface support	All
Display name	Interface Update List
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Command
Access	R
Affected features	Not applicable
Category	/InterfaceEnumeration

Feature descriptions: Interface

This chapter includes:

ActionControl

This category contains all Action Control features of the **Interface module**.

Interface support	GigE
Display name	Action Control
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

ActionCommand

Creates an action command.

Interface support	GigE
Display name	Action Command
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Command
Access	W
Affected features	Not applicable
Category	/ActionControl

ActionDeviceKey

Creates the Action Command Device Key to use in the action command.
Note: This parameter must have the same value for all devices in a group.

Interface support	GigE
Display name	Action Device Key
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	ActionControl

Values	Description
0	Minimum value
4294967295	Maximum value

ActionGroupKey

Creates the Action Command Group Key to use in the action command.

Note: This parameter must have the same value for all devices in a group.

Interface support	GigE
Display name	Action Group Key
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum value
4294967295	Maximum value

ActionGroupMask

Creates the Action Command Group Mask to use in the action command.

Note: This parameter must have the same value for all devices in a group.

Interface support	GigE
Display name	Action Group Mask
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum value
4294967295	Maximum value

ActionScheduledTime

Controls the time for a time-enabled action command.

Interface support	GigE
Display name	Action Scheduled Time
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum value
9223372036854775807	Maximum value

ActionScheduledTimeEnable

Enables or disables time-enabled action commands.

Interface support	GigE
Display name	Action Scheduled Time Enable
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum value
9223372036854775807	Maximum value

GevActionDestinationIPAddress

Controls the destination IP address for the action command.

Note: This can be any valid destination address (including broadcast addresses for this interface).

Interface support	GigE
Display name	Gev Action Destination IP Address
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum value
4294967295	Maximum value

DeviceEnumeration

This category contains all Device Enumeration features of the **Interface module**.

Interface support	All
Display name	Device Enumeration
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

DeviceAccessStatus

Displays the device's access status at the moment of the last execution of `DeviceUpdateList`.

Interface support	All
Display name	Device Access Status
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

Values	Description
Unknown	Producer is unknown.
ReadWrite	Full access
ReadOnly	Read-only access
No access	No connection available
Busy	The device has been opened by another entity already.
OpenReadWrite	The device has been opened in Read/Write mode by this GenTL host.
OpenreadOnly	The device has been opened in Read only mode by this GenTL host.

DeviceCount

Displays the number of found devices

Interface support	All
Display name	Device Count
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

Values	Description
0	Minimum value
4294967295	Maximum value

DeviceDisplayName

[DeviceSelector]

Displays the user readable name of the selected device.

Interface support	All
Display name	Device Display Name
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

DeviceDriverPath

[DeviceSelector]

Displays the system driver path that can be used for opening the selected device.

Interface support	USB
Display name	Device Driver Path
Standard	Custom
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

DeviceID

[DeviceSelector]

Displays the interface wide unique identifier of the selected device.

Interface support	All
Display name	Device ID
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

DeviceLocation

[DeviceSelector]

Displays the location path of the device in the tree of the corresponding interface that can be used for opening the selected device.

Interface support	USB
Display name	Device Location
Standard	Custom
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

DeviceModelName

[DeviceSelector]

Displays the name of the selected device model.

This feature corresponds to `DeviceModelName` of the remote device.

Interface support	All
Display name	Device Model Name
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

DeviceSelector

Selects the device to be displayed.

Interface support	All
Display name	Device Selector
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

Values	Description
≥0	Value range

DeviceType

[DeviceSelector]

Displays the transport layer technology of the selected device.

Interface support	All
Display name	Device Type
Standard	Gen TL SFNC adapted
Origin of feature	Transport layer
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

Values	Description
Custom	MIPI CSI-2
GigEVision	GigE Vision
USB3	USB3 Vision

DeviceUpdateList

Updates the transport layer's device list.

Interface support	All
Display name	Device Update List
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	Command
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

DeviceVendorName

[DeviceSelector]

Displays the vendor's name for the selected device.

This feature corresponds to the `DeviceVendorName` of the remote device.

Interface support	All
Display name	Device Vendor Name
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration

Gev

Note: Features in this subcategory are available for Alvium GigE cameras only.

This category contains GigE related features for Device Enumeration.

Interface support	GigE
Display name	GVCP
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Subcategory)
Category	/DeviceEnumeration

GevDeviceForceGateway

Controls the gateway of the GEV camera to be forced.

Interface support	GigE
Display name	Gev Device Force Gateway
Standard	GenTL SFNC
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

GevDeviceForceIP

Sends the force address command on all interfaces.

Interface support	GigE
Display name	Gev Device Force IP
Standard	GenTL SFNC
Origin of feature	Transport Layer
Feature type	Command
Access	W
Affected features	Not applicable
Category	/DeviceEnumeration/Gev

GevDeviceForceIPAddress

Controls the IP address of the GEV camera to be forced.

Interface support	GigE
Display name	Gev Device Force IP Address
Standard	GenTL SFNC
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

GevDeviceForceSubnetMask

Controls the subnet mask of the GEV camera to be forced.

Interface support	GigE
Display name	Gev Device Force Subnet Mask
Standard	GenTL SFNC
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

GevDeviceIPAddress

[DeviceSelector]

Displays the current IP address of the selected remote device.

Interface support	GigE
Display name	Device IP Address
Standard	GenTL SFNC
Origin of feature	Transport Layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

GevDeviceMACAddress

[DeviceSelector]

Displays the current 48-Bit MAC address of the selected remote device.

Interface support	GigE
Display name	Device MAC Address
Standard	GenTL SFNC
Origin of feature	Transport Layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration/Gev

Values	Description
0	Minimum
9223372036854775807	Maximum

GevDeviceSubnetMask

[DeviceSelector]

Displays the current IP address of the selected remote device.

Interface support	GigE
Display name	Device Subnet Mask
Standard	GenTL SFNC
Origin of feature	Transport Layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

GevInterfaceIPAddress

[DeviceSelector]

Displays the IP address of the selected subnet of the interface.

Interface support	GigE
Display name	Interface IP Address
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

GevInterfaceMACAddress

Displays the current 48-Bit MAC address of the interface.

Interface support	GigE
Display name	Interface MAC Address
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration/Gev

Values	Description
0	Minimum
9223372036854775807	Maximum

GevInterfaceSubnetMask

[DeviceSelector]

Displays the current IP address of the selected subnet of the interface.

Interface support	GigE
Display name	Interface Subnet Mask
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

Settings

The features in this category can be used to specify settings for GigE Device Discovery.

Interface support	GigE
Display name	Settings
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

DevicesDiscoveryBroadcastMode

Selects the area where the interface (= the host) sends DHCP discover messages.

Interface support	GigE
Display name	Discovery Broadcast Mode
Standard	Custom
Origin of feature	Transport layer
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/Settings

Values	Description
Local	The interface sends the discovery broadcast to the local broadcast IP address 255.255.255.255 (default).
Subnet	The interface sends the discovery broadcast to a subnet broadcast IP address, such as 192.168.1.255.

DevicesDiscoveryMode

Controls how the interface discovers connected devices, using GigE Vision discover messages.

Interface support	GigE
Display name	Devices Discovery Mode
Standard	Custom
Origin of feature	Transport layer
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/Settings

Values	Description
Auto	The interface sends the GigE Vision discover message in a frequency [ms]: $InterfaceBeatRate \times InterfaceHailPace$ (Default)
Once	The interface sends the GigE Vision discover message once during the startup of the transport layer.
Off	The interface does not send GigE Vision discover messages.

InterfaceBeatRate

Controls the frequency for the interface to send DHCP discover messages.

Interface support	GigE
Display name	Interface Beat Rate
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Unit	ms (milliseconds)
Affected features	Not applicable
Category	/Settings

Values	Description
10	Minimum value
500	Default value
10000	Maximum value

InterfaceHailPace

Controls the frequency for the interface to "hail" (page) devices.

Interface support	GigE
Display name	Interface Hail Pace
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/Settings

Values	Description
1	Value of `InterfaceBeatRate`
4	Default value
10	10 × value of `InterfaceBeatRate`

InterfacePingPace

Controls the frequency for the interface to ping devices.

Interface support	GigE
Display name	Interface Ping Pace
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/Settings

Values	Description
1	Value of `InterfaceBeatRate`
2	Default value
10	10 × value of `InterfaceBeatRate`

InterfaceInformation

This category contains all Interface Information features of the **Interface module**.

Interface support	All
Display name	Interface Information
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

InterfaceDisplayName
[InterfaceSelector]

Displays the user readable name of the selected interface.

This feature corresponds to the INTERFACE_INFO_DISPLAYNAME command of IFGetInfo function.

Interface support	All
Display name	Interface Display Name
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/InterfaceInformation

InterfaceID
[InterfaceSelector]

Displays the GenTL Producer wide unique identifier of the selected interface.

This feature corresponds to the INTERFACE_INFO_ID command of IFGetInfo function.

Interface support	All
Display name	Interface ID
Standard	Gen TL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/InterfaceInformation

InterfaceType

Displays the transport layer type of the interface.

This feature corresponds to the INTERFACE_INFO_TLTYPE command of IFGetInfo function.

Interface support	All
Display name	Interface Type
Standard	Gen TL SFNC adapted
Origin of feature	Transport layer
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/InterfaceInformation

Values	Description
Custum	MIPI CSI-2
GigEVision	GigE Vision
USB3	USB3 Vision

Feature descriptions: Local Device

This chapter includes:

DeviceInformation

Features in this category provide basic information about the **Device module** and its identity.

Interface support	All
Display name	Device Information
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

DeviceDisplayName

Displays the user readable name of the camera.

This feature corresponds to the DEVICE_INFO_DISPLAYNAME command of DevGetInfo function.

Interface support	All
Display name	Device Display Name
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceInformation

Gev

Note: Features in this subcategory are available for Alvium GigE cameras only.

The features in this subcategory can be used to control IP settings, the communication between the host and the camera, and the transfer of data packets.

Interface support	GigE
Display name	GigE
Standard	GenTL SFNC
Origin of feature	Transport Layer
Feature type	(Category)
Category	/DeviceInformation

DeviceEndianessMechanism

Displays the Endianess mode.

Interface support	GigE
Display name	Device Endianess Mechanism
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/DeviceInformation/Gev

Values	Description
Legacy	Device endianess is handled according to GenICam Schema 1.0 (default).
Standard	Device endianess is handled according to GenICam Schema 1.1 and later.

GevDeviceGateway

Displays the current gateway of the GVCP interface of the selected remote device (camera).

Interface support	GigE
Display name	Device Gateway
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceInformation/Gev

Values	Description
0	Minimum value
4294967295	Maximum value

GevDeviceIPAddress

Displays the current IP address of the GVCP interface of the remote device (camera).

Interface support	GigE
Display name	Device IP Address
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceInformation/Gev

Values	Description
0	Minimum value
4294967295	Maximum value

GevDeviceMACAddress

Displays the current 48-Bit MAC address of the GVCP interface of the remote device (camera).

Interface support	GigE
Display name	Device MAC Address
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceInformation/Gev

Values	Description
0	Minimum value
9223372036854775807	Maximum value

GevDeviceSubnetMask

Displays the current subnet of the GVCP interface of the remote device (camera).

Interface support	GigE
Display name	Device Subnet Mask
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceInformation/Gev

Values	Description
0	Minimum value
4294967295	Maximum value

DeviceInformation (category continued)

The feature descriptions for the `/DeviceInformation/Gev` category have ended on the previous page. The following features continue the `/DeviceInformation` category, without a subcategory.

DeviceID

Displays the interface-wide unique identifier of this device.

This feature corresponds to the DEVICE_INFO_ID command of DevGetInfo function.

Interface support	All
Display name	Device ID
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceInformation

DeviceLocation

Displays the location path of the device in the tree of the corresponding interface that can also be used for opening the device (camera).

Interface support	USB
Display name	Device Location
Standard	Custom
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceInformation

DeviceModelName

Displays the name of the camera model.

Corresponds to the DEVICE_INFO_MODEL command of DevGetInfo function.

Interface support	All
Display name	Device Model Name
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceInformation

DeviceType

Displays the transport layer type of the camera.

Interface support	All
Display name	Device Type
Standard	GenTL SFNC adapted
Origin of feature	Transport layer
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/DeviceInformation

Values	Description
Custom	MIPI CSI-2
GigEVision	GigE Vision
USB3	USB3 Vision

DeviceVendorName

Displays the name of the camera vendor.

This feature corresponds to the DEVICE_INFO_VENDOR command of DevGetInfo function.

Interface support	All
Display name	Device Vendor Name
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceInformation

DriverPath

Displays the system driver path that can also be used for opening the camera.

Interface support	USB
Display name	Driver Path
Standard	Custom
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceInformation

GigE

Note: Features in this category are available for Alvium GigE cameras only.
The features in this category can be used to control IP settings, the communication between the host and the camera, and the transfer of data packets.

Interface support	GigE
Display name	GigE
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

GVCP

Note: Features in this subcategory are available for Alvium GigE cameras only.

The features in this subcategory can be used to control command traffic and timings between the host and the camera.

Interface support	GigE
Display name	GVCP
Standard	Custom
Origin of feature	Transport layer
Feature type	(Subcategory)
Category	/GigE

GVCPCmdRetries

Controls the number of times a particular command to the camera is resent when no answer is being received.

Interface support	GigE
Display name	Command Retries
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	`GevHeartbeatTimeout`, `GevHeartbeatInterval`, `GVCPHBInterval`
Category	/GigE/GVCP

Values	Description
1	Minimum
9	Maximum

GVCPCmdTimeout

Controls the period of time for the host to wait for an answer from the camera.

Interface support	GigE
Display name	Command Timeout
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Unit	ms (milliseconds)
Affected features	`GevHeartbeatTimeout`, `GevHeartbeatInterval`, `GVCPHBInterval`
Category	/GigE/GVCP

Values	Description
100	Minimum
10000	Maximum

GevHeartbeatInterval

Controls the period of time after which a heartbeat is sent by the host.

Interface support	GigE
Display name	Heartbeat Interval
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Unit	ms (milliseconds)
Affected features	GVCPHBInterval
Category	/GigE/GVCP

Values	Description
200	Minimum
200	Maximum

GevHeartbeatTimeout

Controls the period of time after which the camera rejects control by the host if no heartbeat activity is registered.

Interface support	GigE
Display name	Heartbeat Timeout
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Unit	ms (milliseconds)
Affected features	GevHeartbeatInterval, GVCPHBInterval
Category	/GigE/GVCP

Values	Description
25100	Minimum
100000	Maximum

StreamEnumeration

This category contains all Stream Enumeration features of the **Device module**.

Interface support	All
Display name	Stream Enumeration
Standard	GenTL SFNC
Origin of feature	Camera
Feature type	(Category)

StreamCount

Displays the number of available streams.

Interface support	All
Display name	Stream Count
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/StreamEnumeration

Values	Description
0	Minimum value
4294967295	Maximum value

StreamID

[StreamSelector]

Displays the unique ID for the stream of the selected device (camera), for instance a GUID.

Interface support	All
Display name	Stream ID
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/StreamEnumeration

StreamSelector

Selects the stream channel.

Interface support	All
Display name	Stream Selector
Standard	Custom
Origin of feature	Transport layer
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/InterfaceEnumeration

Values	Description
≥0	Value range

Feature descriptions: Camera

This chapter includes:

AcquisitionControl

The features in this category can be used to control acquisition, frame rate, and exposure time, and to enable triggering the camera and connected devices, such as strobe lights.

Interface support	All
Display name	Acquisition Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

AcquisitionFrameCount

Controls the number of frames to acquire in *MultiFrame* acquisition mode.

Interface support	All
Display name	Acquisition Frame Count
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	(number)
Affected features	Not applicable
Category	/AcquisitionControl

AcquisitionFrameRate

Controls the acquisition rate at which the frames are captured.

Notes

- If `AcquisitionFrameRateEnable` is false, `AcquisitionFrameRate` is read-only.
- If values for exposure time or ROI are changed **after** `AcquisitionFrameRate` has been set, the value may be adjusted. See Feature interdependencies on page 32. In this case the value for `AcquisitionFrameRate` must be re-adjusted by the user.

Interface support	All
Display name	Acquisition Frame Rate
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R/W
Unit	Hertz
Affected features	`ExposureTime`
Category	/AcquisitionControl

AcquisitionFrameRateEnable

Enables or disables `AcquisitionFrameRate`.

Note: Otherwise, the frame rate is implicitly controlled by the combination of other features like `ExposureTime`.

Interface support	All
Display name	Acquisition Frame Rate Enable
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	`AcquisitionFrameRate`
Category	/AcquisitionControl

Values	Description
True	`AcquisitionFrameRate` feature is writable and used to control the acquisition rate.
False	`AcquisitionFrameRate` is implicitly controlled by the combination of other features like `ExposureTime`. Automatically, the maximum available frame rate is used.

AcquisitionFrameRateMode

Selects the priority between `AcquisitionFrameRate` and `ExposureTime`.

Interface support	All
Display name	Acquisition Frame Rate Mode
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not affected
Category	/AcquisitionControl

Values	Description
Basic	`ExposureTime` has the priority over `AcquisitionFrameRate`. If `ExposureTime` gets longer than the inverse of `AcquisitionFrameRate`, the resulting acquisition frame rate is reduced accordingly.

AcquisitionMode

Selects the acquisition mode of the camera. The feature defines mainly the number of frames to capture during an acquisition and the way the acquisition stops.

Interface support	All
Display name	Acquisition Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`LineMode`, `TriggerSource`, `LineInverter`, `LineSource`
Category	/AcquisitionControl

Values	Description
Continuous	After an `AcquisitionStart` event: Selects continuous image acquisition until acquisition stop is triggered.
MultiFrame	A number of images is acquired that is specified by `AcquisitionFrameCount`. Further trigger events will be ignored until acquisition is stopped and restarted.
	In case of *MultiFrame*, acquisition can be stopped using `AcquisitionStop` command before it reaches the number of frames specified in `AcquisitionFrameCount`. So, the `AcquisitionStop` trigger event will not be ignored.
SingleFrame	Single images are acquired. Further trigger events will be ignored until acquisition is stopped and restarted.

AcquisitionStart

Starts the acquisition of the camera.

Note: The number of frames captured is specified by `AcquisitionMode`.

Interface support	All
Display name	Acquisition Start
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	Not applicable
Category	/AcquisitionControl

AcquisitionStatus

[AcquisitionStatusSelector]

Displays the state of the internal acquisition signal selected using
`AcquisitionStatusSelector`.

Interface support	All
Display name	Acquisition Status
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R
Affected features	Not applicable
Category	/AcquisitionControl

Values	Description
False	The camera is performing the selected action.
True	The camera is performing the selected action.

AcquisitionStatusSelector

Selects the internal acquisition signal to read using *AcquisitionStatus*.

Interface support	All
Display name	Acquisition Status Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	AcquisitionStatus
Category	/AcquisitionControl

Values	Description
Acquisition Active	The camera acquires one or many frames.
Acquisition Transfer	The camera transfers one or many frames to the host.

AcquisitionStop

Stops the acquisition of the camera at the end of the current frame.

Note: This feature is mainly used when **AcquisitionMode** is *Continuous*, but it can be used in any acquisition mode.

Interface support	All
Display name	Acquisition Stop
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	Not applicable
Category	/AcquisitionControl

ExposureActiveMode

Selects the mode for the **ExposureActive** signal. You can use this feature for synchronizing strobe lights to compensate for the rolling shutter effect.

Note: Global shutter cameras support only *FlashWindow*, other cameras support *FirstLine* and *FlashWindow*.

Interface support	All
Display name	Exposure Active Mode
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	LineInverter, LineMode, LineSelector, LineSource, LineStatus, LineStatusAll, TimerDelay, TimerDuration, TimerReset, TimerSelector, TimerStatus, TimerTriggerActivation, TimerTriggerSource, TriggerSelector
Category	/AcquisitionControl

Values	Description
FirstLine	Sets the **ExposureActive** signal to high when the first line is exposing.
FlashWindow	Sets the **ExposureActive** signal to high when all lines are exposing simultaneously.

ExposureAuto

Selects the auto exposure mode.

Note: The output of the auto exposure function affects the whole image.

Interface support	All
Display name	Exposure Auto
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AcquisitionControl

Values	Description
Continuous	The exposure time varies continuously according to the scene illumination.
Off	Automatic mode is disabled.
Once	Automatic exposure is applied once until the target value of the selected auto control algorithm is achieved, then the value returns to *Off*.

ExposureMode

Selects the operation mode of the exposure (or shutter).

Notes:

- A delay may occur between the trigger signal and the start of the exposure. For the delay with rolling shutter sensor cameras, see your Alvium camera's user guide.
- For *TriggerWidth* and *TriggerControlled*, the resulting exposure time is extended, because of an exposure offset after the trigger pulse.

Interface support	All
Display name	Exposure Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AcquisitionControl

Value	Description
Timed	The exposure time is set by `ExposureTime` or `ExposureAuto`.
TriggerControlled[2]	One or more trigger signals control the exposure time independently from the current frame triggers.
TriggerWidth[1,2]	The width of the current frame trigger signal(s) pulse controls the exposure time.

[1]Controlling the exposure time using *TriggerWidth*: We recommend you to follow the workflow shown in ExposureMode- Using TriggerWidth on page 99.

[2]Global shutter sensor cameras only.

ExposureMode - Using TriggerWidth

Follow the workflow shown in Figure 6 to use *TriggerWidth*.

```
DigitalIOControl:
   LineSelector
       =
     LineX
```
X = selected line

```
DigitalIOControl:
   LineMode
       =
    Input
```

```
AcquisitionControl:
  TriggerSelector
       =
   FrameStart
```

```
AcquisitionControl:
 TriggerActivation
       =
LevelHigh or LevelLow
```

```
AcquisitionControl:
  TriggerSource
       =
    LineX
```
X = selected line

```
AcquisitionControl:
   TriggerMode
       =
     On
```
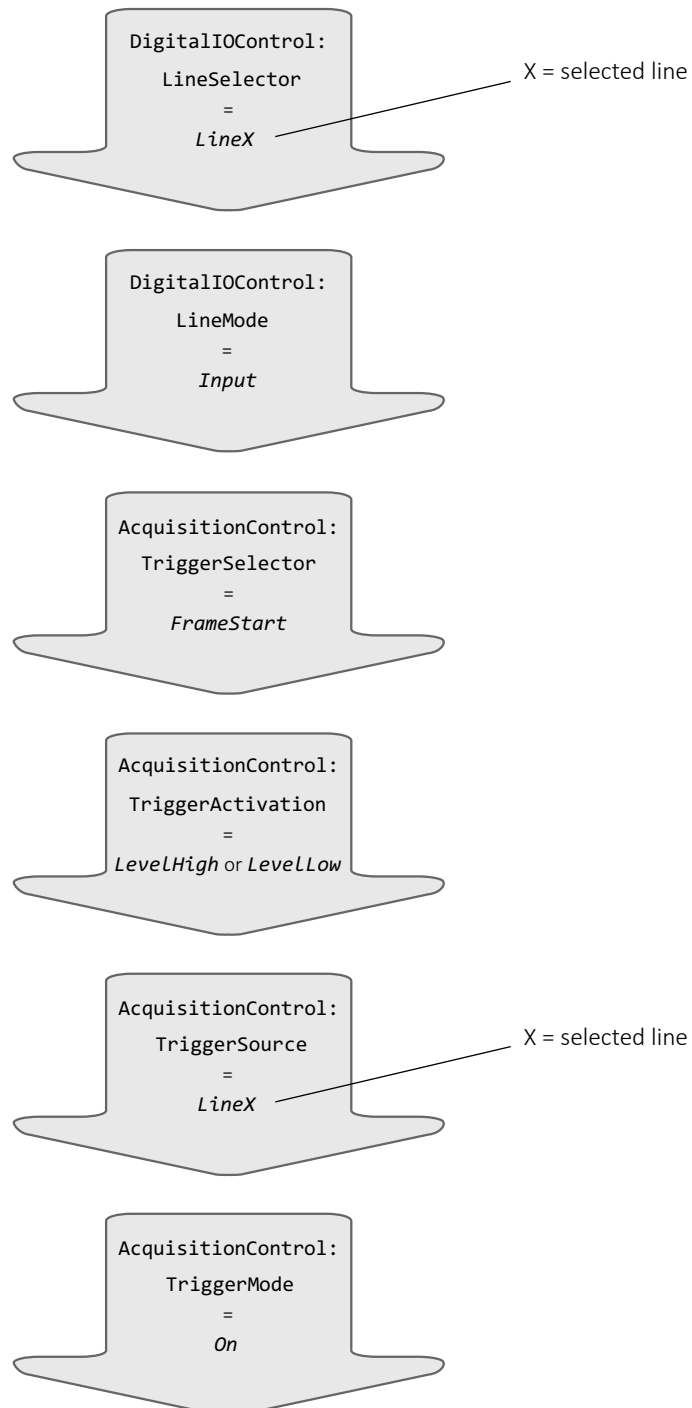
Figure 6: Workflow for using TriggerWidth

ExposureTime

Selects the exposure time when **ExposureMode** is *Timed* and **ExposureAuto** is *Off*. This controls the duration where the photosensitive cells are exposed to light.

Interface support	All
Display name	Exposure Time
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R/W
Unit	Microseconds
Affected features	ExposureAutoMin, ExposureAutoMax, AcquisitionFrameRate
Category	/AcquisitionControl

TriggerActivation

[TriggerSelector]

Selects the electrical signal level of the trigger.

Interface support	All
Display name	Trigger Activation
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AcquisitionControl

Values	Description
AnyEdge	The encoder on the falling or rising edge of the signal is reset.
FallingEdge	The encoder on the falling edge of the signal is reset.
LevelHigh	The encoder at a high signal level is reset.
LevelLow	The encoder at a low signal level is reset.
RisingEdge	The encoder on the rising edge of the signal is reset.

TriggerDelay
[TriggerSelector]

Controls the period of time before the camera corresponds after receiving a trigger signal.

Notes:

* Available only when **TriggeSelector** is set to *FrameStart* or *AcquisitionStart*.
* The value for **TriggerDelay** adds to the sensor related delay between trigger and exposure start. The sensor related delay depends on such as data rate and sensor characteristics.

Interface support	All
Display name	Trigger Delay
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R/W
Unit	Microseconds
Affected features	Not applicable
Category	/AcquisitionControl

Values	Description
0	Minimum
20748634.2705	Maximum

TriggerMode
[TriggerSelector]

Enables or disables the selected trigger.

Interface support	All
Display name	Trigger Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	LineMode, TriggerSource, LineInverter, LineSource
Category	/AcquisitionControl

Values	Description
Off	Triggering is disabled.
On	Triggering is enabled

TriggerSelector

Selects the type of trigger to configure.

Interface support	All
Display name	Trigger Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`TriggerMode, LineMode, TriggerSoftware,` `LineInverter, LineSource, TriggerSource,` `TriggerActivation`
Category	/AcquisitionControl

Values	Description
Acquisition Active	The selected trigger controls the duration of the acquisition of a single frame or many frames. The acquisition is activated when the trigger signal becomes active and terminated when it goes back to the inactive state.
AcquisitionEnd	The trigger terminates the acquisition process.
Acquisition Start	The selected trigger starts the acquisition process.
ExposureActive*	The selected trigger controls the duration of exposure of a single frame (when acquisition is running).
ExposureStart*	The selected trigger starts the exposure of a single frame (when acquisition is running).
ExposureEnd*	The selected trigger ends the exposure of a single frame (when acquisition is running).
FrameStart	The selected trigger starts the capture of a single frame (when acquisition is running).

*Not supported by cameras using rolling shutter sensors.

TriggerSoftware
[TriggerSelector]

Generates an internal trigger. `TriggerSource` must be set to *Software*.

Interface support	All
Display name	Trigger Software
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	Not applicable
Category	/AcquisitionControl

TriggerSource
[TriggerSelector]

Selects the internal signal or physical input line to use as the trigger source.
Note: The selected trigger must have its `TriggerMode` set to *On*.

Interface support	All
Display name	Trigger Source
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AcquisitionControl

Values	Description
Action0[1]	Action0 command is used to signal triggers.
Action1[1]	Action1 command is used to signal triggers.
Counter0Active	Counter0Active is used to signal triggers.
Counter1Active	Counter1Active is used to signal triggers.
Counter2Active	Counter2Active is used to signal triggers.
Counter3Active	Counter3Active is used to signal triggers.
Line0	Physical Line0 is used to signal triggers.
Line1	Physical Line1 is used to signal triggers.
Line2[2]	Physical Line2 is used to signal triggers.
Line3[2]	Physical Line3 is used to signal triggers.
Off	Triggering is disabled.
Software	Software is used to signal triggers.
SoftwareSignal0	SoftwareSignal0 is used to signal triggers.
SoftwareSignal1	SoftwareSignal1 is used to signal triggers.
Timer0Active	Timer0Active is used to signal triggers.
Timer1Active	Timer1Active is used to signal triggers.

[1] Currently, available with Alvium G1/G5 cameras only.

[2] Available with Alvium G1/G5 and Alvium USB cameras. Alvium CSI-2 cameras support Line0 and Line1 only.

ActionControl

Note: Features in this category are available for Alvium GigE cameras only. Support for the other Alvium series is intended for a future firmware release.

The features in this category can be used by external devices to trigger actions within the camera by software commands. This includes ToE (Trigger over Ethernet) where the GigE interface is used for triggering instead of the I/Os.

See SoftwareSignalControl on page 241 for the interaction with features in this category.

Interface support	GigE
Display name	Action Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

ActionDeviceKey

Controls the device key that allows the device to check the validity of action commands.

Notes:

- `ActionDeviceKey` has the unconventional access mode "write only" to make sure that the primary application alone has control over it.
- The device internal assertion of an action signal is only authorized if the `ActionDeviceKey` and the action device key value in the protocol message are equal.

Interface support	GigE
Display name	Action Device Key
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum
4294967295	Maximum (32 Bits)

ActionGroupKey

[ActionSelector]

Controls the key that the device will use to validate the action on reception of the action protocol message.

The device asserts the selected Action signal only if:

- The camera's `ActionDeviceKey` is equal to the action device key in the action protocol message.
- The bitwise AND operation of the action group mask in the action protocol message against the selected `ActionGroupMask` is non-zero.
- The camera's `ActionGroupKey` is equal to the action group key in the action protocol message.

Interface support	GigE
Display name	Action Group Key
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum
4294967295	Maximum

ActionGroupMask

[ActionSelector]

Controls the mask that the device will use to validate the action on reception of the action protocol message.

The device asserts the selected Action signal only if:

- The camera's `ActionDeviceKey` is equal to the action device key in the action protocol message.
- The bitwise AND operation of the action group mask in the action protocol message against the selected `ActionGroupMask` is non-zero.
- The camera's `ActionGroupKey` is equal to the action group key in the action protocol message.

Interface support	GigE
Display name	Action Group Mask
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum
4294967295	Maximum

ActionQueueSize

[ActionSelector]

Displays the size of the scheduled action commands queue. This number represents the maximum number of scheduled action commands that can be pending at a given point in time.

Interface support	GigE
Display name	Action Queue Size
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/ActionControl

Values	Description
0	Minimum
4294967295	Maximum

ActionSelector

Selects to which Action Signal further Action settings apply.

Interface support	GigE
Display name	Action Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	`ActionGroupKey, ActionGroupMask, ActionQueueSize`
Category	/ActionControl

Values	Description
0	Minimum
1	Maximum

AnalogControl

The features in this category can be used to control the intensity levels for Date of document release and color imaging.

Interface support	All
Display name	Analog Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

BalanceRatio
[BalanceRatioSelector]

Controls the ratio of the selected color component to the green color component. This feature is used for white balance.

Interface support	All
Display name	Balance Ratio
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	Not applicable
Category	/AnalogControl

Values	Description
0	Minimum
8	Maximum
0.001	Increment

BalanceRatioSelector

Selects the balance ratio to control.

Interface support	All
Display name	Balance Ratio Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`BalanceRatio`
Category	/AnalogControl

Values	Description
Red	The red channel is adjusted.
Blue	The blue channel is adjusted.

BalanceWhiteAuto

Selects the auto white balance mode.

Interface support	All
Display name	Balance White Auto
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`BalanceWhiteAutoRate`, `BalanceWhiteAutoTolerance`
Category	/AnalogControl

Values	Description
Continuous	Auto white balance is applied continuously.
Once	Auto white balance is applied once. After adjustments have been done, auto white balance is disabled.
Off	Auto white balance is disabled.

BlackLevel

[BlackLevelSelector]

Controls the analog black level as an absolute physical value. The feature represents a DC offset applied to the video signal.

Interface support	All
Display name	Black Level
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	Not applicable
Category	/AnalogControl

Values	Description
1	Increment

BlackLevelSelector

Selects the black level to be controlled by the various black level features.

Interface support	All
Display name	Black Level Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	BlackLevel
Category	/AnalogControl

Value	Description
ALL	All black levels are controlled.

Gain

[GainSelector]

Controls the selected gain as an absolute physical value. This is an amplification factor applied to the video signal.

Interface support	All
Display name	Gain
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R/W
Unit	Decibels [dB]
Affected features	GainAutoMin, GainAutoMax
Category	/AnalogControl

Values	Description
0.1	Increment

GainAuto

[GainSelector]

Selects the auto gain mode.

Note: The output of the auto gain function affects the whole image.

Interface support	All
Display name	Gain Auto
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AnalogControl

Values	Description
Continuous	Gain is continuously adjusted to keep the value set for `IntensityControllerTarget`. This is triggered by such as changes in illumination or in object brightness.
Once	Auto gain is being applied once. After adjustments have been done, gain is disabled.
Off	Auto gain is disabled.

GainSelector

Selects the gain to be controlled by the various gain features.

Interface support	All
Display name	Gain Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`Gain`, `GainAuto`, `GainAutoMax`
Category	/AnalogControl

Value	Description
ALL	All gains are controlled.

Gamma

Controls the gamma correction of pixel intensity.

Interface support	All
Display name	Gamma
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	Not applicable
Category	/AnalogControl

Values	Description
0.4	Minimum
2.4	Maximum
0.5	Increment

AutoModeControl

The features in this category enable auto functions for white balance, gain, and exposure time.

Interface support	All
Display name	Auto Mode Control
Standard	Custom
Origin of feature	Camera
Feature type	(Category)

AutoModeRegionHeight

[AutoModeRegionSelector]

Controls the height of the region used to measure values for all auto functions.

Interface support	All
Display name	Auto Mode Region Height
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	`AutoModeRegionOffsetY`
Category	/AutoModeControl

AutoModeRegionOffsetX

[AutoModeRegionSelector]

Controls the horizontal position of the window used to measure the actual value for the auto function.

Interface support	All
Display name	Auto Mode Region OffsetX
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	`AutoModeRegionWidth`
Category	/AutoModeControl

AutoModeRegionOffsetY

[AutoModeRegionSelector]

Controls the vertical position of the window used to measure the actual value for the auto function.

Interface support	All
Display name	Auto Mode Region OffsetY
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	AutoModeRegionHeight
Category	/AutoModeControl

AutoModeRegionSelector

Selects the auto mode region to configure.

Interface support	All
Display name	Auto Mode Region Selector
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	AutoModeRegionWidth, AutoModeRegionOffsetX, AutoModeRegionHeight, AutoModeRegionOffsetY
Category	/AutoModeControl

Value	Description
AutoModeRegion1	Auto Mode Region 1 is configured.

AutoModeRegionWidth

[AutoModeRegionSelector]

Controls the width of the window used to measure the actual value for the auto function.

Interface support	All
Display name	Auto Mode Region Width
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	AutoModeRegionOffsetX
Category	/AutoModeControl

BalanceWhiteAutoRate

Controls the frequency of white balance adjustments.

Interface support	All
Display name	Balance White Auto Rate
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	BalanceWhiteAutoTolerance
Category	/AutoModeControl

Values	Description
1	Minimum
100	Maximum
1	Increment

BalanceWhiteAutoTolerance

Controls the deviation of the current white balance value from the ideal value at which the white balance is adjusted.

Interface support	All
Display name	Balance White Auto Tolerance
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	`BalanceWhiteAutoRate`
Category	/AutoModeControl

Values	Description
0	Minimum
50	Maximum
1	Increment

ExposureAutoMax

Controls the maximum value for auto exposure.

Note: The output of the auto exposure function affects the whole image.

Interface support	All
Display name	Exposure Auto Max
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	`ExposureAutoMin`
Category	/AutoModeControl

ExposureAutoMin

Controls the minimum value for auto exposure.

Note: The output of the auto exposure function affects the whole image.

Interface support	All
Display name	Exposure Auto Min
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	ExposureAutoMax
Category	/AutoModeControl

GainAutoMax

Controls the maximum value for auto gain.

Note: The output of the auto gain function affects the whole image.

Interface support	All
Display name	Gain Auto Max
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	GainAutoMin
Category	/AutoModeControl

GainAutoMin

Controls the minimum value for auto gain.

Note: The output of the auto gain function affects the whole image.

Interface support	All
Display name	Gain Auto Min
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	GainAutoMax
Category	/AutoModeControl

IntensityAutoPrecedence

Selects the precedence of intensity controller.

Interface support	All
Display name	Intensity Auto Precedence
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AutoModeControl

Values	Description
MinimizeBlur	Orders the control loops so that image blur is minimized: gain first, exposure time second. Long exposure times are avoided if possible.
MinimizeNoise	Orders the control loops so that noise is minimized: exposure time first, gain second. Gain increases are avoided if possible.

IntensityControllerAlgorithm

[IntensityControllerSelector]

Selects the algorithm determining how the histogram is used to determine the current intensity value.

Note: The outliers are disregarded.

Interface support	All
Display name	Intensity Controller Algorithm
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AutoModeControl

Values	Description
Mean	After comparing the arithmetic mean of the current image's histogram to `ExposureAutoTarget`, the exposure time for the next image is adjusted to meet this target. Bright areas are allowed to saturate.

IntensityControllerOutliersBright

[IntensityControllerSelector]

Controls the number of pixels from the top of the distribution to be ignored.

Interface support	All
Display name#	Intensity Controller Outliers Bright
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	Not applicable
Category	/AutoModeControl

Values	Description
0	Minimum
10	Maximum
0.01	Increment

IntensityControllerOutliersDark

IntensityControllerSelector]

Controls the number of pixels from the bottom of the distribution to be ignored.

Interface support	All
Display name	Intensity Controller Outliers Dark
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	Not applicable
Category	/AutoModeControl

Values	Description
0	Minimum
10	Maximum
0.01	Increment

IntensityControllerRate

Controls the rate at which the controller should compute an intensity value.

Note: This value also defines the period at which the associated auto functions change their control value.

Interface support	All
Display name	Intensity Controller Rate
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/AutoModeControl

Values	Description
1	Minimum
100	Maximum

IntensityControllerRegion

Selects the subregion of the image that the intensity controller operates on.

Interface support	All
Display name	Intensity Controller Region
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AutoModeControl

Values	Description
AutoModeRegion1	The intensity controller controls Auto Mode Region 1.
FullImage	The intensity controller controls the full sensor area.

IntensityControllerSelector

Selects the intensity controller to configure.

Interface support	All
Display name	Intensity Controller Selector
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`IntensityControllerOutliersDark`, `IntensityControllerOutliersBright`, `IntensityControllerTolerance`, `IntensityControllerAlgorithm`
Category	/AutoModeControl

Value	Description
`Intensity Controller1`	Intensity Controller 1 is selected to be configured.

IntensityControllerTarget

Controls the target intensity value for auto intensity control as deviation from the mean value in [percent]. The default value for all auto features is 50.

Interface support	All
Display name	Intensity Controller Target
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Unit	Percent [%]
Affected features	Not applicable
Category	/AutoModeControl

Values	Description
`10`	Minimum
`89.9`	Maximum
`0.0001`	Increment
`50`	Default

IntensityControllerTolerance

Controls the deviation of the current value from the target value at which the feature is inactive.

Interface support	All
Display name	Intensity Controller Tolerance
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/AutoModeControl

Values	Description
0	Minimum
50	Maximum
1	Increment

ColorTransformationControl

The features in this category can be used to control the interpolation of the RGB channels for the color image output, and simple access to hue and saturation.

Interface support	All
Display name	Color Transformation Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

This section describes features related to color transformations in color cameras. The following features are only valid if using on-camera interpolated pixel formats.

The color transformation is a linear operation taking as input the triplet R_{in}, G_{in}, B_{in} for an RGB color pixel. This triplet is multiplied by a 3×3 matrix. This color transformation allows to change the coefficients of the 3×3 matrix.

$$\begin{bmatrix} R_{out} \\ G_{out} \\ B_{out} \end{bmatrix} = \begin{bmatrix} Gain00 & Gain01 & Gain02 \\ Gain10 & Gain11 & Gain12 \\ Gain20 & Gain21 & Gain22 \end{bmatrix} \times \begin{bmatrix} R_{in} \\ G_{in} \\ B_{in} \end{bmatrix}$$

ColorTransformationEnable

[ColorTransformationSelector]

Enables or disables the selected color transformation module.

Interface support	All
Display name	Color Transformation Enable
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	`ColorTransformationValue`
Category	/ColorTransformationControl

Values	Description
True	The selected color transformation module is enabled.
False	The selected color transformation module is disabled.

ColorTransformationValue

[ColorTransformationSelector][ColorTransformationValue-Selector]

Selects the gain factor or offset for the selected color transformation.

Interface support	All
Display name	Color Transformation Value
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	Not applicable
Category	/ColorTransformationControl

Values	Description
-4	Minimum
+4	Maximum
1	Default

ColorTransformationValueSelector

[ColorTransformationSelector]

Selects the gain factor or offset of the Transformation matrix for the selected Color Transformation module.

Interface support	All
Display name	Color Transformation Value Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	ColorTransformationValue
Category	/ColorTransformationControl

For values described in the following table, see ColorTransformationControl on page 126 for the color transformation matrix.

Values	Description
Gain00	Gain 00 for the red contribution to the red pixel (multiplicative factor) is selected.
Gain01	Gain 01 for the green contribution to the red pixel (multiplicative factor) is selected.
Gain02	Gain 02 for the red contribution to the red pixel (multiplicative factor) is selected.
Gain10	Gain 10 for the red contribution to the green pixel (multiplicative factor) is selected.
Gain11	Gain 11 for the green contribution to the green pixel (multiplicative factor) is selected.
Gain12	Gain 12 for the blue contribution to the green pixel (multiplicative factor) is selected.
Gain20	Gain 20 for the red contribution to the blue pixel (multiplicative factor) is selected.
Gain21	Gain 21 for the green contribution to the blue pixel (multiplicative factor) is selected.
Gain22	Gain 22 for the blue contribution to the blue pixel (multiplicative factor) is selected.

Hue

Controls the color tone correction by rotating the chrominance field clockwise with values > 0 and counter clockwise with values < 0 in degrees [°].

Interface support	All
Display name	Hue
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Unit	Degrees [°]
Affected features	PixelFormat, DeviceLinkThroughputLimit, ExposureAutoMin, ExposureAutoMax, ExposureTime, AcquisitionFrameRate, Width, OffsetX, AutoModeRegionWidth, AutoModeRegionOffsetX, AutoModeRegionHeight, AutoModeRegionOffsetY, PayloadSize, WidthMax, Height, OffsetY, HeightMax, PixelSize, ContrastEnable, ContrastDarkLimit, ContrastBrightLimit, BlackLevel, Saturation, ColorTransformationEnable, ColorTransformationValue
Category	/ColorTransformationControl

Values	Description
-40	Minimum (40 degrees)
+40	Maximum (40 degrees)
0	Default

Saturation

Controls the amplification of the chrominance signal in the color space.

Interface support	All
Display name	Saturation
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	Not applicable
Category	/ColorTransformationControl

Values	Description
0	Minimum
+2	Maximum
1	Default

CorrectionControl

The features in this category can be used to control DPC (Defect pixel correction) and FPNC (Fixed pattern noise correction) for image correction.

Interface support	All
Display name	Correction Control
Standard	Custom
Origin of feature	Camera
Feature type	(Category)

CorrectionMode

Enables or disables correction features.

Interface support	All
Display name	Correction Mode
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CorrectionControl

Values	Description
Off	Correction features are disabled.
On	Correction features are enabled.

CorrectionSelector

Selects the type of correction to configure.

Interface support	All
Display name	Correction Selector
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`CorrectionMode`, `CorrectionSet`, `CorrectionSetDefault`, `CorrectionDataSize`, `CorrectionEntryType`
Category	/CorrectionControl

Values	Description
DefectPixel Correction*	Defect pixel correction (DPC) is selected.
FixedPattern NoiseCorrection*	Fixed pattern noise correction (FPNC) is selected.

*Availability is camera model dependent.

CorrectionSet

[CorrectionSelector]

Selects the currently enabled correction settings.

Interface support	All
Display name	Correction Set
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/(W)
Affected features	Not applicable
Category	/CorrectionControl

Values	Description
Preset	Factory settings are enabled (default).
User*	User settings are enabled.

*Available only if a user correction set has been written to the camera memory.

CorrectionSetDefault

[CorrectionSelector]

Selects the correction set used when the camera is reset.

Interface support	All
Display name	Correction Set Default
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/CorrectionControl

Values	Description
Preset	Factory settings are used after camera reset.
User*	User settings are used after camera reset.

*Available only if a user correction set has been written to the camera memory.

CorrectionInfo (subcategory)

The features in this subcategory can be used to display the correction type currently used.

Interface support	All
Display name	Correction Info
Standard	Custom
Origin of feature	Camera
Feature type	Subcategory
Category	/CorrectionControl

CorrectionDataSize

[CorrectionSelector]

Displays the current size of the correction data that is stored inside the camera.

Interface support	All
Display name	Correction Data Size
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/CorrectionControl/CorrectionInfo

CorrectionEntryType

Displays the entry type (correction type specific variant).

Interface support	All
Display name	Correction Entry Type
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/CorrectionControl/CorrectionInfo

CounterAndTimerControl

The features in this category can be used to control counters and timers to enable advanced triggering. For example, you can synchronize the timing for image acquisition with strobe lights, using these features.

Interface support	All
Display name	Counter And Timer Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

CounterDuration

[CounterSelector]

Controls the period of time until a *CounterEnd* event is generated, the *CounterActive* signal becomes inactive, and the counter is stopped.

Notes:
- The counter is stopped until a new trigger occurs.
- The counter can be reset by `CounterReset`.

Interface support	All
Display name	Counter Duration
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Values	Description
0	Minimum
4294967295	Maximum

CounterEventActivation

[CounterSelector]

Selects the edge type of the electrical signal related to the event defined by `CounterEventSource` to increment the counter.

Note: The electrical signal level of the trigger to activate the counter is selected by `CounterTriggerActivation`.

Interface support	All
Display name	Counter Event Activation
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AcquisitionControl

Values	Description
AnyEdge	The encoder on the falling or rising edge of the signal is reset.
FallingEdge	The encoder on the falling edge of the signal is reset.
RisingEdge	The encoder on the rising edge of the signal is reset.

CounterEventSource

[CounterSelector]

Selects the event to increment the counter.

Note: Use `CounterEventActivation` to define which electrical state of the signal you want to be used.

Interface support	All
Display name	Counter Event Source
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
AcquisitionActive	The *AcquisitionActive* signal increments the counter.
Action0	The *Action0* signal increments the counter.
Action1	The *Action1* signal increments the counter.
Counter0Active	The *Counter0Active* signal increments the counter.
Counter1Active	The *Counter1Active* signal increments the counter.
Counter2Active	The *Counter2Active* signal increments the counter.
Counter3Active	The *Counter3Active* signal increments the counter.
ExposureActive	The *ExposureActive* signal increments the counter.
Line0	A trigger signal on Line0 increments the counter.
Line1	A trigger signal on Line1 increments the counter.
Line2	A trigger signal on Line2 increments the counter.
Line3	A trigger signal on Line3 increments the counter.
Off	The feature is disabled.
SoftwareSignal0	The *SoftwareSignal0* signal increments the counter.
SoftwareSignal1	The *SoftwareSignal1* signal increments the counter.
Timer0Active	The *Timer0Active* signal increments the counter.
Timer1Active	The *Timer1Active* signal increments the counter.

CounterReset

[CounterSelector]

Resets and restarts the selected counter.

Note: The counter is incremented immediately after the reset unless a counter trigger is active.

Interface support	All
Display name	Counter Reset
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	`CounterDuration`, `CounterStatus`, `CounterTriggerActivation`, `CounterTriggerSource`, `CounterValue`
Category	`/CounterAndTimerControl`

CounterResetActivation

[CounterSelector]

Selects the electrical signal level of the trigger to reset the counter.

Interface support	All
Display name	Counter Reset Activation
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	`/AcquisitionControl`

Values	Description
AnyEdge	The encoder on the falling or rising edge of the signal is reset.
FallingEdge	The encoder on the falling edge of the signal is reset.
LevelHigh	The encoder at a high signal level is reset.
LevelLow	The encoder at a low signal level is reset.
RisingEdge	The encoder on the rising edge of the signal is reset.

CounterResetSource

[CounterSelector]

Selects the event to reset the counter.

Interface support	All
Display name	Counter Reset Source
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
AcquisitionActive	The *AcquisitionActive* signal resets the counter.
Counter0Active	The *Counter0Active* signal resets the counter.
Counter1Active	The *Counter1Active* signal resets the counter.
Counter2Active	The *Counter2Active* signal resets the counter.
Counter3Active	The *Counter3Active* signal resets the counter.
ExposureActive	The *ExposureActive* signal resets the counter.
Line0	A trigger signal on Line0 resets the counter.
Line1	A trigger signal on Line1 resets the counter.
Line2	A trigger signal on Line2 resets the counter.
Line3	A trigger signal on Line3 resets the counter.
Off	The feature is disabled.
SoftwareSignal0	The *SoftwareSignal0* signal resets the counter.
SoftwareSignal1	The *SoftwareSignal1* signal resets the counter.
Timer0Active	The *Timer0Active* signal resets the counter.
Timer1Active	The *Timer1Active* signal resets the counter.

CounterSelector

Selects the counter to configure.

Interface support	All
Display name	Counter Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
Counter0	Counter0Active is selected.
Counter1	Counter1Active is selected.
Counter2	Counter2Active is selected.
Counter3	Counter3Active is selected.

CounterStatus

[CounterSelector]

Displays the current status of the counter.

Interface support	All
Display name	Counter Status
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
CounterActive	The counter is counting for the period of time specified by CounterDuration.
CounterCompleted	The counter has reached the CounterDuration value.
CounterOverflow	The counter has reached its maximum possible count.
CounterTriggerWait	The counter is waiting for a start trigger.
Idle	The counter is inactive.

CounterTriggerActivation
[CounterSelector]
Selects the electrical signal level of the trigger to activate the counter.

Interface support	All
Display name	Counter Trigger Activation
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
AnyEdge	The encoder on the falling or rising edge of the signal is reset.
FallingEdge	The encoder on the falling edge of the signal is reset.
LevelHigh	The encoder at a high signal level is reset.
LevelLow	The encoder at a low signal level is reset.
RisingEdge	The encoder on the rising edge of the signal is reset.

CounterTriggerSource

[CounterSelector]

Selects the event to trigger the counter.

Interface support	All
Display name	Counter Trigger Source
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
AcquisitionActive	The *AcquisitionActive* signal starts the counter.
Counter0Active	The *Counter0Active* signal starts the counter.
Counter1Active	The *Counter1Active* signal starts the counter.
Counter2Active	The *Counter2Active* signal starts the counter.
Counter3Active	The *Counter3Active* signal starts the counter.
ExposureActive	The *ExposureActive* signal starts the counter.
Line0	A trigger signal on Line0 starts the counter.
Line1	A trigger signal on Line1 starts the counter.
Line2	A trigger signal on Line2 starts the counter.
Line3	A trigger signal on Line3 starts the counter.
Off	The feature is disabled.
SoftwareSignal0	The *SoftwareSignal0* signal starts the counter.
SoftwareSignal1	The *SoftwareSignal1* signal starts the counter.
Timer0Active	The *Timer0Active* signal starts the counter.
Timer1Active	The *Timer1Active* signal starts the counter.

CounterValue

[CounterSelector]

Controls the current value of the selected counter.

Note: Writing to `CounterValue` is typically used to set the start value.

Interface support	All
Display name	Counter Value
Standard	SFNC (adapted)
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
0	Minimum value
4294967295	Maximum value

CounterValueAtReset

[CounterSelector]

Displays the latest value of the selected counter before it was reset by a trigger or by an explicit `CounterReset` command.

Interface support	All
Display name	Counter Value At Reset
Standard	SFNC (adapted)
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
0	Minimum value
4294967295	Maximum value

TimerDelay
[TimerSelector]

Controls the duration of the delay at the reception of a trigger before starting the timer.

Interface support	All
Display name	Timer Delay
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R/W
Unit	Microseconds
Affected features	Not applicable
Category	/CounterAndTimerControl

Values	Description
0	Minimum
429496729.5	Maximum

TimerDuration

[TimerSelector]

Controls the duration of the timer pulse.

When the timer reaches the TimerDuration value:

- For `TimerStatus`, the value is changed from *TimerActive* to *TimerCompleted*.
- The timer stops counting until the camera receives a new trigger, or until the timer is explicitly reset with `TimerReset`.

Interface support	All
Display name	Timer Duration
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R/W
Unit	Microseconds
Affected features	Not applicable
Category	/CounterAndTimerControl

Values	Description
0	Minimum
429496729.5	Maximum

TimerReset

[TimerSelector]

The selected timer is reset by software and restarted.

Note: The timer starts immediately after the reset unless a timer trigger is active.

Interface support	All
Display name	Timer Reset
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	`TimerDelay`, `TimerDuration`, `TimerStatus`, `TimerSelector`, `TimerTriggerActivation`, `TimerTriggerSource`
Category	/CounterAndTimerControl

TimerSelector

Selects the timer to be configured.

Interface support	All
Display name	Timer Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`TimerDelay`, `TimerDuration`, `TimerReset`, `TimerStatus`, `TimerTriggerActivation`, `TimerTriggerSource`
Category	/CounterAndTimerControl

Value	Description
`Timer0`	Timer0 is selected.
`Timer1`	Timer1 is selected.

TimerStatus

[TimerSelector]
Displays the current status of the selected timer.

Interface support	All
Display name	Timer Status
Standard	SFNC (adapted)
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
`TimerActive`	The timer is active.
`TimerCompleted`	The timer has completed.
`TimerDelay`	The timer is delayed by the period of time set for `TimerDelay`.
`TimerTriggerWait`	The timer is waiting for a trigger.

TimerTriggerActivation

[TimerSelector]
Selects the electrical signal level of the trigger to activate the timer.

Interface support	All
Display name	Timer Trigger Activation
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
AnyEdge	The timer is triggered by a signal on any edge.
FallingEdge	The timer is triggered by a signal on the falling edge.
LevelHigh	The timer is triggered when signal level turns to high.
LevelLow	The timer is triggered when signal level turns to low.
RisingEdge	The timer is triggered by a signal on the rising edge.

TimerTriggerSource
[TimerSelector]
Selects the electrical signal level of the trigger to start the selected timer.

Interface support	All
Display name	Timer Trigger Source
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
AcquisitionActive	The timer is triggered when the acquisition starts.
Action0[1]	The timer is triggered by the Action0 command.
Action1[1]	The timer is triggered by the Action1 command.
Counter0Active	The timer is triggered when Counter0 is active
Counter1Active	The timer is triggered when Counter1 is active
Counter2Active	The timer is triggered when Counter2 is active
ExposureActive[2]	The timer is triggered when the exposure starts.
Line0	The timer is triggered by a signal on input line 0.
Line1	The timer is triggered by a signal on input line 1.
Line2[3]	The timer is triggered by a signal on input line 2.
Line3[3]	The timer is triggered by a signal on input line 3.
Off	The timer is disabled or stopped (default).
SoftwareSignal0	The timer is triggered by SoftwareSignal0.
SoftwareSignal1	The timer is triggered by SoftwareSignal1.
Timer0Active	The timer is triggered when Timer0 is active
Timer1Active	The timer is triggered when Timer1 is active

[1] Currently, available with Alvium G1/G5 cameras only.

[2] Available for cameras with global shutter sensors and with rolling shutter senors if `TriggerMode` is enabled or if `AcquisitionMode` is set to *Continuous*.

[3] Available with Alvium G1/G5 and Alvium USB cameras. Alvium CSI-2 cameras support Line0 and Line1 only.

DeviceControl

The features in this category can be used to display, such as the camera temperature and name, firmware version, transport layer, or applied standard versions for GenCP and SFNC.

Other features enable monitoring the link speed, controlling the bandwidth, and resetting the camera. Timestamp features are essential for counters and timers.

Interface support	All (most features)
Display name	Device Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

DeviceFamilyName

Displays the identifier of the product family of the camera.

Interface support	All
Display name	Device Family Name
Standard	SFNC
Origin of feature	Camera
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceFirmwareID

[DeviceFirmwareIDSelector]

Displays one or a list of firmware IDs of the camera.

Interface support	All
Display name	Device Firmware ID
Standard	Custom
Origin of feature	Camera
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceFirmwareIDSelector

Selects the `DeviceFirmwareID` to be read after restarting the camera.

Interface support	All
Display name	Device Firmware ID Selector
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`DeviceFirmwareID`
Category	/DeviceControl

Values	Description
Current	The current firmware ID is selected to be read after the next camera restart.
Supported	Another than the current firmware ID is selected to be read after the next camera restart.

DeviceFirmwareVersion

[DeviceFirmwareVersionSelector]

Displays the version of the firmware in the camera.

Interface support	All
Display name	Device Firmware Version
Standard	SFNC
Origin of feature	Camera
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl/DeviceControl

DeviceFirmwareVersionSelector

Selects the `DeviceFirmwareVersion` to be read after restarting the camera.

Interface support	All
Display name	Device Firmware Version Selector
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	DeviceFirmwareVersion
Category	/DeviceControl

Values	Description
Current	The current firmware version is selected to be read after the next camera restart.
Programmed	Another than the current firmware version is selected to be read after the next camera restart.

DeviceGenCPVersionMajor

Displays the major version of the GenCP supported by the camera.

Interface support	CSI-2, USB
Display name	Device GenCP Version Major
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	DeviceGenCPVersionMinor
Category	/DeviceControl

DeviceGenCPVersionMinor

Displays the minor version of the GenCP supported by the camera.

Interface support	CSI-2, USB
Display name	Device GenCP Version Minor
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	`DeviceGenCPVersionMajor`
Category	/DeviceControl

DeviceIndicatorLuminance

Controls the luminance of the indicators (such as LEDs) showing the status of the camera.

Interface support	All
Display name	Device Indicator Luminance
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/DeviceControl

Values	Description
0	Minimum
10	Maximum

DeviceIndicatorMode

Selects the behavior of the indicators (such as LEDs) showing the status of the camera.

Interface support	All
Display name	Device Indicator Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/DeviceControl

Values	Description
Active	The indicator is enabled.
ErrorStatus	The indicator signals an error status.
Inactive	The indicator is disabled.

DeviceLinkCommandTimeout

Displays the command timeout of the specified link.

Interface support	All
Display name	Device Link Command Timeout
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R
Unit	Microseconds
Affected features	Not applicable
Category	/DeviceControl

Values	Description
0	Minimum
1,000,000,000	Maximum

DeviceLinkSpeed

Displays the speed of transmission negotiated and represents the total speed of all the connections of the specified link.

Interface support	All
Display name	Device Link Speed
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Bytes per second
Affected features	Not applicable
Category	/DeviceControl

DeviceLinkThroughputLimit

Controls the maximum bandwidth of the data streamed out by the camera on the selected link. Delays are uniformly inserted between transport layer packets reducing the peak bandwidth.

Notes:
- Use this feature to adjust camera data output to the performance of your host system to avoid lost frames. Additionally, you may reduce the frame rate to reduce bandwidth.
- Maximum values can be reduced by the bandwidth of the host system.

Interface support	GigE, USB
Display name	Device Link Throughput Limit
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Bytes per second
Affected features	`ExposureTimeMax`, `ExposureTimeMin`, `ExposureAutoMin`, `ExposureAutoMax`, `ExposureTime`, `AcquisitionFrameRate`
Category	/DeviceControl

Values Alvium G1	Description
Camera model dependent	Minimum
125000000	Maximum

Values Alvium G5	Description
Camera model dependent	Minimum
625000000	Maximum

Values Alvium 1800 U	Description
Camera model dependent	Minimum
200000000	Default
450000000	Maximum

DeviceLinkThroughputLimitMode

Enable or disables `DeviceLinkThroughputLimit`.

When this feature is disabled, low-level transport layer (TL) specific features are expected to control the throughput.

When this feature is enabled, `DeviceLinkThroughputLimit` controls the overall throughput.

Interface support	GigE, USB
Display name	Device Link Throughput Limit Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`ExposureTimeMax, ExposureTimeMin, ExposureAutoMin, ExposureAutoMax, ExposureTime, AcquisitionFrameRate`
Category	/DeviceControl

Values	Description
Off	`DeviceLinkThroughputLimit` is disabled (GigE default).
On	`DeviceLinkThroughputLimit` is enabled (USB default).

DeviceManufacturerInfo

Displays the manufacturer information about the camera.

Interface support	All
Display name	Device Manufacturer Info
Standard	SFNC
Origin of feature	Camera
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceModelName

Displays the model name of the camera.

Interface support	All
Display name	Device Model Name
Standard	SFNC
Origin of feature	Camera
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DevicePowerSavingMode

Selects between standard power use and various power saving modes.

Interface support	USB
Display name	Device Power Saving Mode
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/DeviceControl

Values	Description
Disabled	The camera uses standard power (default).
SuspendMode	The camera is enabled to go into USB U3 power saving mode.[1]

[1]To apply the selected power saving mode, the host must send a `DevicePowerSave` command or a respective backend command to the camera.

DeviceReset

Resets the camera to its power up state.

Note: After reset, the camera must be rediscovered.

Interface support	All
Display name	Device Reset
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	Not applicable
Category	/DeviceControl

DeviceSFNCVersionMajor

Displays the major version of the SFNC that was used to create the camera`s GenICam XML.

Interface support	All
Display name	Device SFNC Version Major
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceSFNCVersionMinor

Displays the minor version of the SFNC that was used to create the camera's GenICam XML.

Interface support	All
Display name	Device SFNC Version Minor
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceSFNCVersionSubMinor

Displays the sub minor version of the SFNC that was used to create the camera's GenICam XML.

Interface support	All
Display name	Device SFNC Version Sub Minor
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceScanType

Displays the scan type of the image sensor.

Interface support	All
Display name	Device Scan Type
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/DeviceControl

Values	Description
Areascan	2D area readout is selected.

DeviceSerialNumber

Displays the camera's serial number.
Displays the unique identifier of the camera.

Interface support	All
Display name	Device Serial Number
Standard	SFNC
Origin of feature	Camera
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceStreamChannelPacketSize

Displays the stream packet size achieved on the selected channel for the transmitter or the maximum packet size supported by the receiver.

Interface support	GigE
Display name	Device Stream Channel Packet Size
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Bytes
Affected features	Not applicable
Category	/DeviceControl

Value	Description
0	Minimum
4294967295	Maximum

DeviceTemperature

[DeviceTemperatureSelector]

Displays the camera temperature in degrees Celsius [°C], measured at the location selected by `DeviceTemperatureSelector`.

Interface support	All
Display name	Device Temperature
Standard	SFNC
Origin of feature	Camera
Feature type	Float
Access	R
Unit	Degrees Celsius
Affected features	Not applicable
Category	/DeviceControl

DeviceTemperatureSelector

Selects the location in the camera, where the temperature is to be measured.

Interface support	All
Display name	Device Temperature Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`DeviceTemperature`
Category	/DeviceControl

Value	Description
Mainboard	The mainboard temperature is measured.
FpgaCore[1]	The FPGA (companion board) temperature is measured.
PhyCore[1]	The physical interface temperature is measured.

[1] Alvium G5 only.

DeviceTLVersionMajor

Displays the major version of the camera's transport layer.

Interface support	All
Display name	Device Transport Layer Version Major
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceControl

Value	Description
0	Minimum
4294967295	Maximum

DeviceTLVersionMinor

Displays the minor version of the camera transport layer.

Interface support	All
Display name	Device Transport Layer Version Minor
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceControl

Value	Description
0	Minimum
4294967295	Maximum

DeviceUserID

Controls the user-programmable camera identifier.

Note: Maximum 63 characters are allowed.

Interface support	All
Display name	Device User ID
Standard	SFNC
Origin of feature	Camera
Feature type	String
Access	R/W
Affected features	Not applicable
Category	/DeviceControl

DeviceVendorName

Displays the name of the camera manufacturer.

Interface support	All
Display name	Device Vendor Name
Standard	SFNC
Origin of feature	Camera
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceVersion

Displays the camera's product code.

Interface support	All
Display name	Device Version
Standard	SFNC
Origin of feature	Camera
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

TimestampLatch

Latches the current timestamp counter into `TimestampLatchValue`.

Interface support	All
Display name	Time Stamp Latch
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	`TimestampLatchValue`
Category	/DeviceControl

TimestampLatchValue

Displays the latched value of the timestamp counter.

Interface support	All
Display name	Timestamp Latch Value
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceControl

Value	Description
0	Minimum
9223372036854775807	Maximum

TimestampReset

Resets the current value of the timestamp counter.

Note: After executing this command, the timestamp counter restarts automatically.

Interface support	All
Display name	Timestamp Reset
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	TimestampLatchValue
Category	/DeviceControl

DigitalIOControl

The features in this category can be used to control the physical input and output lines of the camera.

Interface support	All
Display name	Digital IO Control Info
Standard	SFNC adapted
Origin of feature	Camera
Feature type	(Category)

LineDebounceDuration

Controls the time constant for `LineDebounceMode`.

Interface support	GigE, USB
Display name	Line Debounce Duration
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Unit	Microseconds
Affected features	Not applicable
Category	/DigitalIOControl

Values	Description
0.0193236715	Minimum
39.5748792271	Maximum

LineDebounceMode

Controls the Line Debouncing feature for a particular input line.

Interface support	GigE, USB
Display name	Line Debounce Mode
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	LineDebounceDuration
Category	/DigitalIOControl

Values	Description
Delay	LineDebounceDuration controls how long the signal level must be sustained for before it is accepted.
Off	The feature is disabled (default).
Stall	LineDebounceDuration controls the intensity duration after the falling edge of the signal.

LineInverter
[LineSelector]

Enables or disables the inversion of the signal of the selected input or output line.

Interface support	All
Display name	Line Inverter
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	Not applicable
Category	/DigitalIOControl

Values	Description
False	Signal of the input or output line is not inverted.
True	Signal of the input or output line is inverted.

LineMode

[LineSelector]

Selects the physical line to be used to input or output a signal.

Interface support	All
Display name	Line Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`TriggerSource, LineInverter, LineSource`
Category	/DigitalIOControl

Values	Description
Input	The physical line is used for signal input.
Output	The physical line is used for signal output.

LineSelector

Selects the physical line (or pin) of the external camera connector or the virtual line of the transport layer to configure.

Interface support	All
Display name	Line Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`LineMode, LineSource, LineInverter, LineStatus, LineStatusAll`
Category	/DigitalIOControl

Values	Description
Line0	Line 0 is selected for configuration.
Line1	Line 1 is selected for configuration.
Line2	Line 2 is selected for configuration.
Line3	Line 3 is selected for configuration.

LineSource

[LineSelector]

Sets the output signal for the selected line.

Note: `LineMode` must be set to *Output*.

Interface support	All
Display name	Line Source
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/DigitalIOControl

Values	Description
AcquisitionActive	The *AcquisitionActive* signal is output.
Action0[1]	The Action0 command is output.
Action1[1]	The Action1 command is output.
Counter0Active	The *Counter0Active* signal is output.
`...`	...
Counter3Active	The *Counter3Active* signal is output.
ExposureActive[2]	The *ExposureActive* signal is output.
FrameTrigger Wait	The *FrameTriggerWait* signal is output.
Line0Signal	The *Line0Signal* signal is output.
`...`	...
Line3Signal[3]	The *Line3Signal* signal is output.
PpsSignal	The PpsSignal of the pulse is output. You can use this signal to verify that the devices' clocks are synchronized sufficiently for PTP.
Off	No signal is output.
Stream0Transfer Active	The *Stream0TransferActive* signal is output.
Timer0Active	The *Timer0Active* signal is output.
Timer1Active	The *Timer1Active* signal is output.

[1] Currently, available with Alvium G1/G5 cameras only.

[2] Available for cameras with global shutter sensors and with rolling shutter senors if `TriggerMode` is enabled or if `AcquisitionMode` is set to *Continuous*.

[3] Available with Alvium G1/G5 and Alvium USB cameras. Alvium CSI-2 cameras support Line0 and Line1 only.

LineStatus

[LineSelector]

Displays the current status of the selected input or output line.

Interface support	All
Display name	Line Status
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R
Affected features	Not applicable
Category	/DigitalIOControl

Values	Description
False	Line status is disabled.
True	Line status is enabled.

LineStatusAll

Displays the current status of every input or output line in a sequence from Line0 to LineN in a single bitfield.

Interface support	All
Display name	Line Status All
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DigitalIOControl

Values	Description
0	Minimum
15	Maximum

SerialHubEnable

Enables or disables the serial port (UART).

Note: When this features is enabled, the corresponding lines become Rx and Tx. Therefore, the user application can't control these lines then.

Interface support	All
Display name	Serial Hub Enable
Standard	Custom
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	`LineInverter`, `LineMode`, `LineSource`
Category	/DigitalIOControl

Values	Description
True	The serial port is enabled.
False	The serial port is disabled (default).

Available lines

For Alvium G1 and G5 cameras and for Alvium USB cameras, 2 lines can be used as serial ports while 2 lines can be accessed by the user application at the same time.

For Alvium CSI-2 camera, 2 lines can be used as serial ports while the remaining 2 lines are reserved for I2C traffic.:

UART signal	CSI-2 Lines	G1 / G5 lines	USB lines
UART Tx	Line2	Line0	Line2
UART Rx	Line3	Line1	Line3

Table 6: I/O lines available for serial ports by Alvium series

Changing between enabled and disabled serial ports

Previous line settings are not stored. You must reconfigure the corresponding lines if you want to change between use as serial ports and access by the user application.

SerialHub (subcategory)

The features in this subcategory enable using the I/Os by UART for serial port.

Interface support	All
Display name	Serial Hub
Standard	Custom
Origin of feature	Camera
Feature type	Subcategory
Category	/DigitalIOControl

SerialBaudRate

Selects the baud rate of the UART port.

Interface support	All
Display name	Uart Baud Rate
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Unit	Baud = Bps (Bits per second)
Affected features	LineMode, LineInverter, LineSource
Category	/DigitalIOControl/SerialHub

Values	Description
Baud_9600	9600 Baud is selected.
Baud_115200	115200 Baud is selected.
Baud_230400	230400 Baud is selected.

SerialParityBit

Selects the Parity Bit at the end of UART frames.

Interface support	All
Display name	Serial Parity Bit
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Unit	Baud = Bps (Bits per second)
Affected features	Not applicable
Category	/DigitalIOControl/SerialHub

Values	Description
Even	The number of 1 bits in frame is even.
Mark	The parity bit is always set to 1.
None	No parity bit is in the frame.
Odd	The number of 1 bits in frame is odd.
Space	The parity bit is always set to 0.

SerialRxData

Displays the data to be fetched from the Rx queue.

Interface support	All
Display name	Serial Rx Data
Standard	Custom
Origin of feature	Camera
Feature type	Raw
Access	R
Affected features	Not applicable
Category	/DigitalIOControl/SerialHub

SerialRxSize

Controls the number of bytes inserted from the Rx queue.

Interface support	All
Display name	Serial Rx Size
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Bytes
Affected features	Not applicable
Category	/DigitalIOControl/SerialHub

Values	Description
1	Minimum
4	Default
128	Maximum

SerialRxWaiting

Displays the number of bytes from the Rx queue waiting to be received.

Interface support	All
Display name	Serial Rx Waiting
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Bytes
Affected features	Not applicable
Category	/DigitalIOControl/SerialHub

Values	Description
0	Minimum
128	Maximum

SerialStopBits

Controls the number of stop bits at the end of UART frames.

Interface support	All
Display name	Serial Stop Bits
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/DigitalIOControl/SerialHub

Values	Description
1	Minimum (default)
2	Maximum

SerialTxData

Controls the data that will be transmitted to the TX queue of the serial interface.

Interface support	All
Display name	Serial Tx Data
Standard	Custom
Origin of feature	Camera
Feature type	Raw
Access	R/W
Affected features	Not applicable
Category	/DigitalIOControl/SerialHub

SerialTxLock

Locks or unlocks the transmission from the Tx queue.

When unlocked, the Tx queue is immediately sent over the serial port.

Interface support	All
Display name	Serial Tx Lock
Standard	Custom
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	Not applicable
Category	/DigitalIOControl/SerialHub

Values	Description
True	The transmission from the Tx queue is locked.
False	The transmission from the Tx queue is unlocked (default).

SerialTxRemaining

Displays the number bytes from the Tx queue that remain free.

Interface support	All
Display name	Serial Tx Remaining
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Bytes
Affected features	Not applicable
Category	/DigitalIOControl/SerialHub

Values	Description
0	Minimum
128	Maximum

SerialTxSize

Controls the number of bytes from the Tx data to be inserted into the Tx queue.

Interface support	All
Display name	Serial Tx Size
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Bytes
Affected features	Not applicable
Category	/DigitalIOControl/SerialHub

Values	Description
1	Minimum
4	Default
128	Maximum

FileAccessControl

The features in this category enable to read from and write files to the camera, including such as firmware, user data, or datasets for DPC (Defect pixel correction) and FPNC (Fixed pattern noise correction).

Interface support	All
Display name	File Access Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

FileAccessBuffer

Displays the intermediate access buffer that allows the exchange of data between the camera file storage and the application.

Interface support	All
Display name	File Access Buffer
Standard	SFNC
Origin of feature	Camera
Feature type	Register
Access	R
Affected features	Not applicable
Category	/FileAccessControl

FileAccessLength

Displays the length of the mapping between the camera file storage and `FileAccessBuffer`.

Interface support	All
Display name	File Access Length
Standard	SFNC
Origin of feature	Camera
Feature type	Register
Access	R
Affected features	Not applicable
Category	/FileAccessControl

FileAccessOffset

Displays the offset of the mapping between the camera file storage and the `FileAccessBuffer`.

Interface support	All
Display name	File Access Offset
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/FileAccessControl

FileOpenMode

Selects the access mode in which a file is opened in the camera.

Interface support	All
Display name	File Open Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/FileAccessControl

Values	Description
Read	Read access is enabled.
Write	Write access is enabled.

FileOperationExecute

Executes the operation selected by `FileOperationSelector` on the selected file.

Interface support	All
Display name	File Operation Execute
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	`FileAccessBuffer`, `FileAccessOffset`, `FileAccessLength`, `FileOperationStatus`, `FileOperationResult`, `FileSize`
Category	/FileAccessControl

FileOperationResult

[FileSelector][FileOperationSelector]

Displays the file operation result. For read or write operations, the number of successfully read or written bytes is returned.

Interface support	All
Display name	File Operation Result
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/FileAccessControl

FileOperationSelector
[FileSelector]

Selects the target operation for the selected file in the camera. This operation is executed when the `FileOperationExecute` feature is called.

Damage to the defect pixel correction data set

If you select *DefectPixelCorrectionPreset* for `FileSelector`, you also have write access. This way, the DPC correction data from manufacturing can be overwritten.

Before you write to this data set, read and save the data to an external source for recovery!

Interface support	All
Display name	File Operation Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`FileOperationExecute`, `FileAccessBuffer`, `FileAccessOffset`, `FileAccessLength`, `FileOperationStatus`, `FileOperationResult`, `FileSize`
Category	/FileAccessControl

Values	Description
Close	The selected file s closed.
Delete	The selected file is deleted.
Open	The selected file is opened.
Read	The selected file is read from.
Write	The selected file is written to.

FileOperationStatus

[FileSelector][FileOperationSelector]

Displays the file operation execution status.

Interface support	All
Display name	File Operation Status
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/FileAccessControl

Values	Description
Failure	File operation failed.
Success	File operation was successful (default).

FileProcessStatus

[FileSelector]

Displays an additional process status.

Interface support	All
Display name	File Process Status
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/FileAccessControl

Values	Description
None	No extended status (default).
UpdateNotRequired	No file operation is required, because flash and file content are identical.

FileSelector

Selects the target file in the camera.

Damage to the defect pixel correction data set

If you select *DefectPixelCorrectionPreset* for `FileSelector`, you also have write access. This way, the DPC correction data from manufacturing can be overwritten.

Before you write to this data set, read and save the data to an external source for recovery!

Interface support	All
Display name	File Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`FileStatus, FileSize, FileOpenMode, FileOperationSelector, FileOperationExecute, FileAccessBuffer, FileAccessOffset, FileAccessLength, FileOperationStatus, FileOperationResult`
Category	/FileAccessControl

Values	Description
DefectPixel CorrectionPreset	The preset for defect pixel correction (DPC) is target for file operations.
DefectPixel CorrectionUser	User defined defect pixel correction (DPC) is target for file operations.
Firmware	Firmware is target for file operations.
FixedPattern NoiseCorrectionPreset	The preset for fixed pattern noise correction (FPNC) is target for file operations.
FixedPattern NoiseCorrectionUser	User defined fixed pattern noise correction (FPNC) user set is target for file operations.
UserData	User data is target for file operations.
UserSet1	UserSet1 target for file operations.
UserSet2	UserSet2 target for file operations.
UserSet3	UserSet3 target for file operations.
UserSet4	UserSet4 target for file operations.

FileSize

[FileSelector]

Displays the size of the selected file in bytes.

Interface support	All
Display name	File Size
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/FileAccessControl

FileStatus

[FileSelector]

Displays the status of the selected file.

Interface support	All
Display name	File Status
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/FileAccessControl

Values	Description
Closed	The selected file is currently closed (default).
Open	The selected file is currently open.

ImageFormatControl

The features in this category can be used to control pixel related data, including binning and ROI (region of interest), and reverse image. `PixelFormat` and `PixelSize` enable selecting between different modes for Date of document release and color pixel readout.

`SensorBitDepth` can be used to control the bandwidth by different sensor readout modes (ADC).

When set to *GlobalResetReleaseShutter*, sensor lines are integrated simultaneously for selected rolling shutter sensors with `ShutterMode.`

Interface support	All (most features)
Display name	Image Format Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

BinningHorizontal

Controls the number of horizontal pixels combined into one. This reduces the horizontal resolution (width) of the image.

Note: For Alvium models ≥12 MP resolution, if `BinningVertical` is used, `BinningHorizontal` is set to 2.

Interface support	All
Display name	Binning Horizontal
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	WidthMax
Category	/ImageFormatControl

Values	Description
1	Minimum
8	Maximum

BinningHorizontalMode

Determines whether the result of binned pixels is averaged or summed up.

Note: Changing `BinningHorizontalMode` sets `BinningVerticalMode` to the same value.

Interface support	All
Display name	Binning Horizontal Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`AcquisitionFrameRate, BinningHorizontal, BinningVertical, BinningVerticalMode, DeviceLinkThroughputLimit, ExposureAutoMax, ExposureAutoMin, ExposureTime, HeightMax, WidthMax`
Category	/ImageFormatControl

Values	Description
Average	The charge or gray value of adjacent pixels is averaged.
Sum	The charge or gray value of adjacent pixels is summed up.

BinningSelector

Selects which binning engine is controlled by `BinningHorizontal` and `BinningVertical`.

Interface support	All
Display name	Binning Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`AcquisitionFrameRate, BinningHorizontal, BinningHorizontalMode, BinningVertical, BinningVerticalMode, DeviceLinkThroughputLimit, ExposureAutoMax, ExposureAutoMin, ExposureTime, HeightMax, WidthMax`
Category	/ImageFormatControl

Values	Description
Digital	Digital binning is used (default).
Sensor*	Sensor binning is used.

*Availability only for selected models.

In *Sensor* mode, vertical binning is disabled and `BinningHorizontalMode` can be set to *Sum* only.

BinningVertical

Controls the number of vertical pixels combined into one. This reduces the vertical resolution (height) of the image.

Interface support	All
Display name	Binning Vertical
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	AcquisitionFrameRate, BinningHorizontal, DeviceLinkThroughputLimit, ExposureAutoMax, ExposureAutoMin, ExposureTime, HeightMax, WidthMax
Category	/ImageFormatControl

Values	Description
1	Minimum
8	Maximum

BinningVerticalMode

Determines whether the result of binned pixels is averaged or summed up.

Note: Changing `BinningVerticalMode` sets `BinningHorizontalMode` to the same value.

Interface support	All
Display name	Binning Vertical Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`AcquisitionFrameRate, BinningHorizontal, BinningVertical, BinningHorizontalMode, DeviceLinkThroughputLimit, ExposureAutoMax, ExposureAutoMin, ExposureTime, HeightMax, WidthMax`
Category	/ImageFormatControl

Values	Description
Average	The charge or gray value of adjacent pixels is averaged.
Sum	The charge or gray value of adjacent pixels is summed up.

Height

Controls the image height output by the camera.

Interface support	All
Display name	Height
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	`OffsetY, AutoModeRegionOffsetY, AutoModeRegionHeight, AcquisitionFrameRate, PayloadSize`
Category	/ImageFormatControl

HeightMax

Displays the available maximum image height.

Note: This dimension is calculated after vertical binning or any other function changing the vertical dimension of the image.

Interface support	All
Display name	Height Max
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Pixel
Affected features	`Height, OffsetY`
Category	/ImageFormatControl

OffsetX

Controls the horizontal offset from the origin to the ROI.

Interface support	All
Display name	Offset X
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	`AutoModeRegionOffsetX, AutoModeRegionWidth`
Category	/ImageFormatControl

Values	Description
`0`	Minimum

OffsetY

Controls the vertical offset from the origin to the ROI.

Interface support	All
Display name	Offset Y
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	`AutoModeRegionOffsetY, AutoModeRegionHeight`
Category	/ImageFormatControl

Values	Description
`0`	Minimum

PixelFormat

Selects the pixel format output by the camera.

Note: The feature represents all the information provided by `PixelCoding,` `PixelSize,` and `PixelColorFilter` combined in a single feature.

Interface support	All
Display name	Pixel Format
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`DeviceLinkThroughputLimit, PayloadSize, PixelSize,` `BlackLevel, ContrastEnable, ContrastDarkLimit,` `ContrastBrightLimit, BlackLevel, Hue, Saturation,` `ColorTransformationEnable,` `ColorTransformationValue, HeightMax, WidthMax`
Category	/ImageFormatControl

PixelSize

Displays the total size of a pixel of the image as Bits per pixel (Bpp).

Interface support	All
Display name	Pixel Size
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R
Unit	Bits
Affected features	Not applicable
Category	/ImageFormatControl

ReverseX

Enables or disables to flip the image horizontally.

Note: The ROI is applied after the flipping.

Interface support	All
Display name	Reverse X
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	`Width`, `WidthMax` (color cameras)
Category	/ImageFormatControl

Values	Description
False	Image is not flipped horizontally.
True	Image is flipped horizontally.

ReverseY

Enables or disables to flip the image vertically.

Note: The ROI is applied after the flipping.

Interface support	All
Display name	Reverse Y
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	`Height`, `HeightMax` (color cameras)
Category	/ImageFormatControl

Values	Description
False	Image is not flipped vertically.
True	Image is flipped vertically.

SensorBitDepth

Selects the readout mode of the camera sensor.

If you are using pixel formats that do not require 12-bit readout and you want to achieve higher frame rates, you can select between readout modes for 12-bit, 10-bit, and 8-bit.

Notes

- The sensor ADC bit depth is the default value.
- In the *Adaptive* mode, the bit depth is switched between 10-bit and 12-bit automatically, depending on the selected pixel format and limitations of sensor and camera.

Interface support	GigE, USB
Display name	Sensor Bit Depth
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Unit	Bits
Affected features	AcquisitionFrameRate, DeviceLinkThroughputLimit, ExposureActiveMode, ExposureAuto, ExposureAutoMax, ExposureAutoMin, ExposureMode, ExposureTime
Category	/ImageFormatControl

Values[1]	Description
Adaptive	The sensor bit depth is switched automatically between 12-bit and 10-bit readout, depending on the pixel format. (Default value for all camera models.)
Bpp8	The sensor bit depth is set to 8-bit, if supported by the sensor.
Bpp10	The sensor bit depth is set to 10-bit, if supported by the sensor.
Bpp12	The sensor bit depth is set to 12-bit if the camera sensor supports 12-bit readout mode.

[1]Camera model dependent

SensorHeight

Displays the effective sensor height.

Interface support	All
Display name	Sensor Height
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Pixel
Affected features	HeightMax
Category	/ImageFormatControl

SensorWidth

Displays the effective sensor width.

Interface support	All
Display name	Sensor Width
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Pixel
Affected features	WidthMax
Category	/ImageFormatControl

MultipleRegionControl (subcategory)

This subcategory holds the features to configure and control the multiple regions of the camera.

Interface support	GigE, USB
Display name	Multiple Region Control
Standard	Custom
Origin of feature	Camera
Feature type	(Subcategory)
Category	/ImageFormatControl

First overview

Multiple region features can be used to assign different image settings to sections of an image, or to exclude irrelevant contents from the image output. In some cases, frame rates can be increased as well.

Availability by model

You can find the feature availability for your Alvium model in the feature specifications of your camera's user guide at www.alliedvision.com/en/support/technical-documentation.

Features available with multiple regions

The following features for image control can be adjusted separately:

- Hue
- BalanceRatioBlue
- BalanceRatioRed
- ColorTransformationEnable
- ColorTransformationValue
- ContrastBrightLimit
- ContrastDarkLimit
- ContrastEnable
- ContrastShape
- Gamma
- Hue
- Saturation

Features disabled by multiple regions

The following features are disabled when multiple regions are used:

- ReverseX
- ReverseY
- Binning features

Multiple regions cannot be configured when these features are enabled.

Multiple region arrangement

SubRegionSelector is set to *Region0* by default for all camera models. For cameras that support only single ROI, no other regions or multiple region features are available. Selected Alvium models support 4 regions.
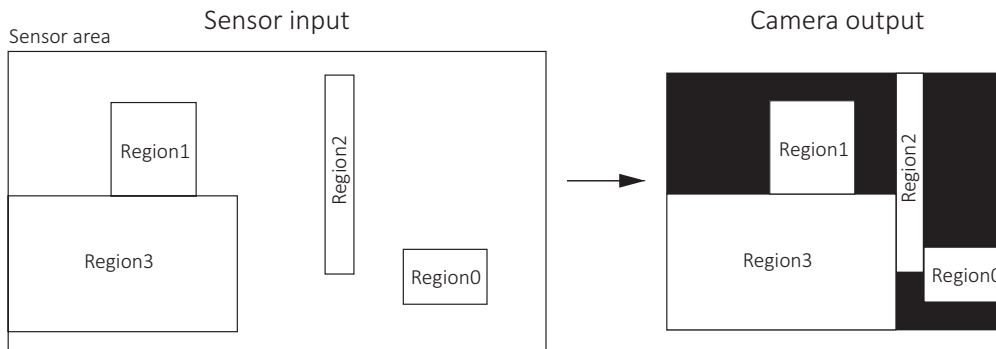
Free mode

Figure 7: Free mode - sensor input vs. camera output
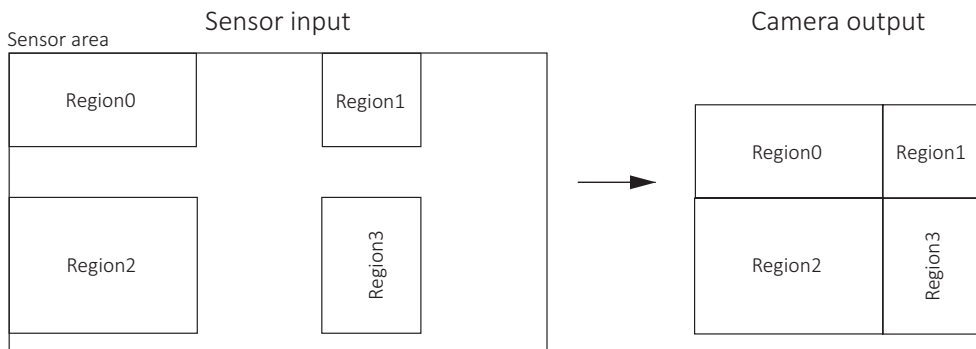
Tile mode

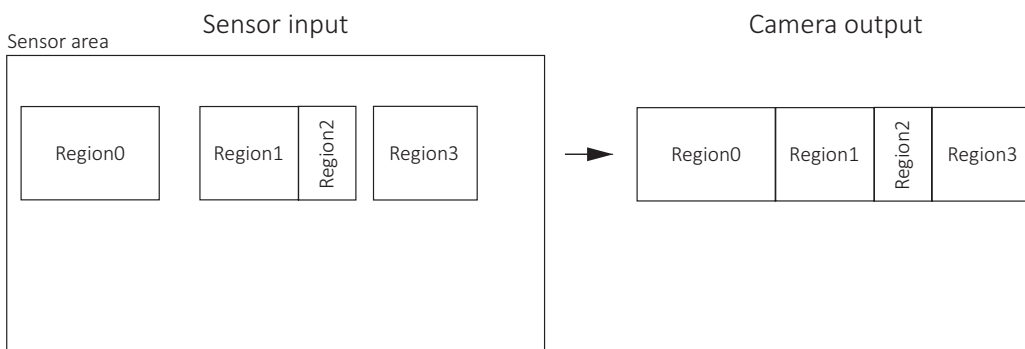*Figure 8: Tile mode - sensor input vs. camera output*

Horizontal mode
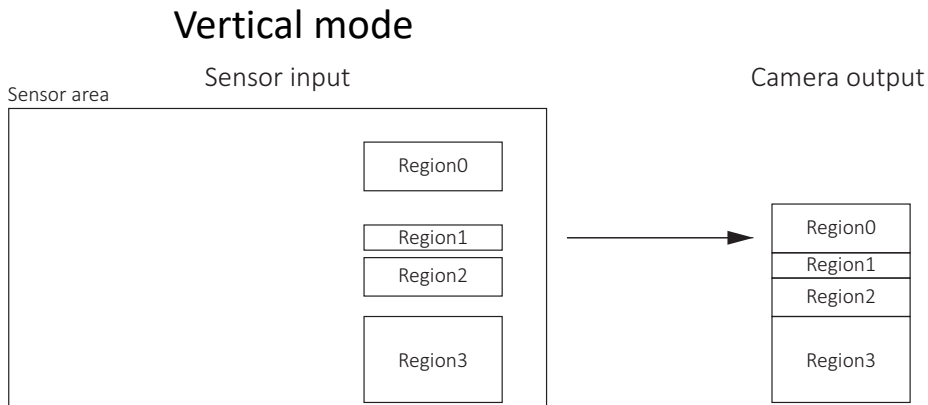

Figure 9: Horizontal mode - sensor input vs. camera output

Vertical mode

Figure 10: Vertical mode - sensor input vs. camera output

Rules for region ID numbers

Generally, the IDs for `SubRegionSelector` must be assigned continuously, ascending from *Region0*, to output the selected regions completely.

In *Tile* mode, if an ID is missing in a line or column space, the following regions are omitted, as shown in the top example of Figure 11 where *Region1* and *Region2* have been disabled.

In the example below, *Region0* and *Region2*. do not have continuous IDs, but they share a common line space. Therefore, the selected regions are output completely.
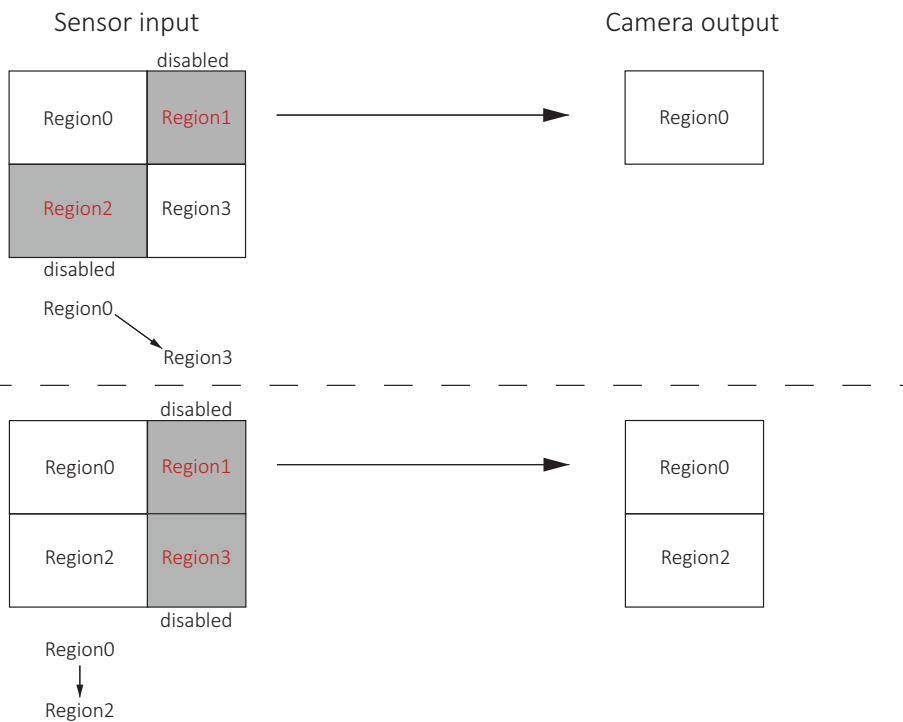

Figure 11: Tile mode - missing Region1

In *Horizontal* and *Vertical* mode, the values for `SubRegionSelector` must be assigned continuously. If an ID is missing, the following regions are omitted, as shown in the top example of Figure 12 where *Region1* has been disabled. In the example below, the regions have been reassigned for *Region1* and *Region2*. The selected regions are output completely.
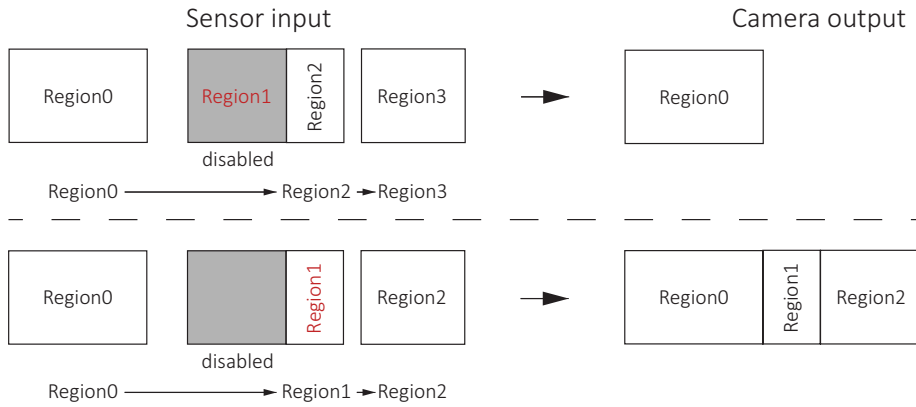

Figure 12: Horizontal mode - missing Region1

Region arrangement modes data at a glance

Table 7 shows ranges for `MultipleRegionArrangement` modes.

Arrangement mode	Availability[1]	Number of regions[2]	Position	Subregion ID order	Pixel gaps
Free mode[3]	All		Free	Free	
Tile	All	1 to 4	Common values for `SubRegionOffsetX` and `SubRegionWidth` with regions arranged one above another. Common values for `SubRegionOffsetY` and `SubRegionHeight` with regions arranged next to one another	See Figure 8, Figure 11	Yes
Horizontal	Some cameras		Common values for `SubRegionOffsetY` and `SubRegionHeight`	Left to right	
Vertical	Some cameras		Common values for `SubRegionOffsetX` and `SubRegionWidth`	Top to bottom	

[1] For cameras that support multiple regions
[2] Regions must not overlap
[3] Default

Table 7: Ranges for MultipleRegionArrangement modes

Values for width, height, and offsets

When multiple regions are enabled, feature values are:

- `Width` = Number of horizontal pixels of the **output image**
- `Height` = Number of vertical pixels of the **output image**
- `OffsetX` = Horizontal offset from the top left corner of the **sensor image**
- `OffsetY` = Vertical offset from the top left corner of the **sensor image**

Single ROI and AutoModeControl

Multiple regions are part of the functional family for regions cropped out of the full sensor image. The following section describes the relation between these functions.

Single ROI

Multiple regions can be set while the camera is operated in single ROI mode. Changes become effective when `MultipleRegionEnable` is set to *True*.

When *Region0* is activated in multiple regions for the first time, the feature values for the active single ROI (or the full sensor image) are taken over. When features for *Region0* have been adjusted separately and multiple regions are disabled, the last values for *Region0* are applied for the single ROI (or the full sensor image).

Switching between ROI modes

We recommend you not to switch between single ROI and multiple ROI.

Auto mode regions

Auto mode regions equal single ROI (or the full sensor image) by default. Size and position of auto mode regions can be adjusted to subsets. See Regions of interest and auto mode regions on page 33.

When multiple regions are enabled, auto mode regions are automatically adjusted to match *Region0*. Therefore, when *Region0* is adjusted, an active auto mode region is adjusted simultaneously. Afterwards, auto mode regions can be adjusted, but only as a subset of *Region0*.

When multiple regions are disabled, size and position for *Region0* is applied for the auto mode regions.

MultipleRegionArrangement

Selects the position of the separate ROIs in the merged image.

Note: ROIs cannot overlap.

Interface support	GigE, USB
Display name	Multiple Region Arrangement
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`Height`, `OffsetX`, `OffsetY`, `Width`
Category	/ImageFormatControl/MultipleRegionControl

Values	Description
Tile	Selects 2 to 4 regions that add to a common rectangle without gaps.
Horizontal	Selects 2 to 4 regions next to each other that add to a common rectangle without gaps.
Vertical	Selects 2 to 4 regions above each other that add to a common rectangle without gaps.
Free	Selects 2 to 4 regions in free arrangement, allowing gaps (default).

MultipleRegionEnable

Selects between single region and multiple regions mode. The number of subregions to be configured depends on the camera model.

Interface support	GigE, USB
Display name	Multiple Region Enable
Standard	Custom
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	`Height`, `OffsetX`, `OffsetY`, `Width`
Category	/ImageFormatControl/MultipleRegionControl

Values	Description
False	Single region mode is enabled, subregions mode is disabled (**default**). `Height`, `OffsetX`, `OffsetY`, and `Width` be used as usual.
True	Subregions mode is enabled. `Height`, `OffsetX`, `OffsetY`, and `Width` features are locked and are automatically aligned with the values set for subregions.

SubRegionHeight

[SubRegionSelector]

Height of the selected subregion.

Note: If values are entered that are not dividable by 8, `SubRegionHeight` is increased automatically to the next higher available value. For example, if *9* is entered, the value is increased to *16*.

Interface support	GigE, USB
Display name	Sub Region Height
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixels
Affected features	`Height`, `Width`
Category	/ImageFormatControl/MultipleRegionControl

Values	Description
Model dependent	Minimum
(Height max)	Maximum, depending on the height of other subregions
Model dependent	Increment

SubRegionMode

[SubRegionSelector]

Enables or disables the selected subregion.

Interface support	GigE, USB
Display name	Sub Region Mode
Standard	Custom
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	`Height`, `OffsetX`, `OffsetY`, `Width`
Category	/ImageFormatControl/MultipleRegionControl

Values	Description
On	The selected subregion is enabled.
Off	The selected subregion is disabled (default).

SubRegionOffsetX

[SubRegionSelector]

X-offset of the selected subregion.

Note: If values are entered that are not dividable by 8, `SubRegionOffsetX` is increased automatically to the next higher available value. For example, if *18* is entered, the value is increased to *32*.

Interface support	GigE, USB
Display name	Sub Region Offset X
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixels
Affected features	`OffsetX`
Category	/ImageFormatControl/MultipleRegionControl

Values	Description
Model dependent	Minimum
(Height max)	Maximum, depending on the height of other subregions
Model dependent	Increment

SubRegionOffsetY

[SubRegionSelector]

Y-offset of the selected subregion.

Note: If values are entered that are not dividable by 8, `SubRegionOffsetY` is increased automatically to the next higher available value. For example, if *9* is entered, the value is increased to *16*.

Interface support	GigE, USB
Display name	Sub Region Offset Y
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixels
Affected features	`OffsetY`
Category	/ImageFormatControl/MultipleRegionControl

Values	Description
Model dependent	Minimum
(Height max)	Maximum, depending on the height of other subregions
Model dependent	Increment

SubRegionSelector

Selects the subregion in a range from *0* to *n*, where *0* is the index of the first subregion and *n* is the index of the last one.

Interface support	GigE, USB
Display name	Sub Region Selector
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	SubRegionHeight, SubRegionMode, SubRegionWidth, SubRegionOffsetX, SubRegionOffsetY
Category	/ImageFormatControl/MultipleRegionControl

Values[1]	Description
Region0	Minimum
RegionN	Maximum

SubRegionWidth

[SubRegionSelector]

Width of the selected subregion.

Note: If values are entered that are not dividable by 8, `SubRegionWidth` is increased automatically to the next higher available value. For example, if *626* is entered, the value is increased to *640*.

Interface support	GigE, USB
Display name	Sub Region Height
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixels
Affected features	`Height`
Category	/ImageFormatControl/MultipleRegionControl

Values	Description
Model dependent	Minimum
(Height max)	Maximum, depending on the height of other subregions
Model dependent	Increment

ImageFormatControl (category continued)

The feature descriptions for the `/ImageFormatControl/MultipleRegion Control` subcategory have ended on the previous page. The following features continue the `/ImageFormatControl` category, without a subcategory.

ShutterMode

Selects the shutter type for cameras where the sensor can be operated in different shutter modes.

Interface support	All
Display name	Shutter Mode
Standard	SFNC adapted
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/ImageFormatControl

Values*	Description
GlobalResetReleaseShutter	The camera is operated using global reset release shutter (GRS).
GlobalShutter	The camera is operated using global shutter (GS).
RollingShutter	The camera is operated using rolling shutter (RS).

*Camera model dependent

Width

Controls the image width of the image output by the camera.

Interface support	All
Display name	Width
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	OffsetX, AutoModeRegionOffsetX, AutoModeRegionWidth, AcquisitionFrameRate, ExposureAutoMin, ExposureAutoMax, ExposureTime, PayloadSize
Category	/ImageFormatControl

WidthMax

Displays the available maximum image width.

Note: The dimension is calculated after horizontal binning or any other function changing the horizontal dimension of the image.

Interface support	All
Display name	Width Max
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Pixel
Affected features	Width, OffsetX
Category	/ImageFormatControl

ImageProcessingControl

The features in this category enable on-board image processing for contrast, noise suppression and convolution filters, sharpness and blur. You can use `ColorInterpolation` to select the number of merged pixels used for debayering.

Interface support	All
Display name	Image Processing Control
Standard	Custom
Origin of feature	Camera
Feature type	(Category)

AdaptiveNoiseSupressionFactor

Controls the amount of the noise suppression.

Interface support	All
Display name	Adaptive Noise Supression Factor
Standard	Custom
Origin of feature	Camera
Feature type	Float
Access	R/W
Affected features	Not applicable
Category	/ImageProcessingControl

Values	Description
0.5	Minimum value
1	The feature is disabled.
2	Maximum value

ColorInterpolation

Selects the `ColorInterpolation` filter.

Note: This feature is available only with color models.

Interface support	All
Display name	Color Interpolation
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/ImageProcessingControl

Values	Description
Basic2x2	Basic 2×2 algorithm for debayering is selected.
Bilinear3x3	A standard 3×3 algorithm for debayering is selected.
HighQuality Linear5x5	A high-quality linear interpolation for debayering is selected (default).

ContrastControl (subcategory)

The features in this subcategory enable on-board image processing for contrast.

Interface support	All
Display name	Contrast Control
Standard	Custom
Origin of feature	Camera
Feature type	Subcategory
Category	/ImageProcessingControl

ContrastBrightLimit

Selects the maximum gray value for the image.

Note: The current **value ranges displayed for 8-bit and 10-bit pixel formats are higher than the calculated values**.

Interface support	All
Display name	Contrast Bright Limit
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	`ContrastDarkLimit`
Category	/ImageProcessingControl/ContrastControl

Values	Description
`ContrastDarkLimit + 1`	The minimum value is selected.
`4095`	The maximum value is selected.

Pixel bit depth [bit]	Value range	Calculated value range	Pixel count per increment
8	*0* to *4095*	*0* to *255*	$^1/_{16}$
10	*0* to *4095*	*0* to *1023*	$^1/_4$
12		*0* to *4095*	1

ContrastDarkLimit

Selects the minimum gray value for the image.

Note: The current **value ranges displayed for 8-bit and 10-bit pixel formats are higher than the calculated values**. See ContrastBrightLimit on page 212.

Interface support	All
Display name	Contrast Dark Limit
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	`ContrastBrightLimit`
Category	/ImageProcessingControl/ContrastControl

Values	Description
`0`	The minimum value is selected.
`ContrastBrightLimit – 1`	The maximum value is selected.

ContrastEnable

Enables or disables the contrast enhancement features.

Interface support	All
Display name	Contrast Enable
Standard	Custom
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	Not applicable
Category	/ImageProcessingControl/ContrastControl

Values	Description
`False`	The feature is disabled.
`True`	The feature is enabled.

ContrastShape

Controls the sigmoid shape of the transfer curve.

Interface support	All
Display name	Contrast Shape
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ImageProcessingControl/ContrastControl

Values	Description
1	Minimum value
4	Default value
10	Maximum value
1	Increment

Figure 13 and Figure 14 on page 215 show the transfer curves for different values.
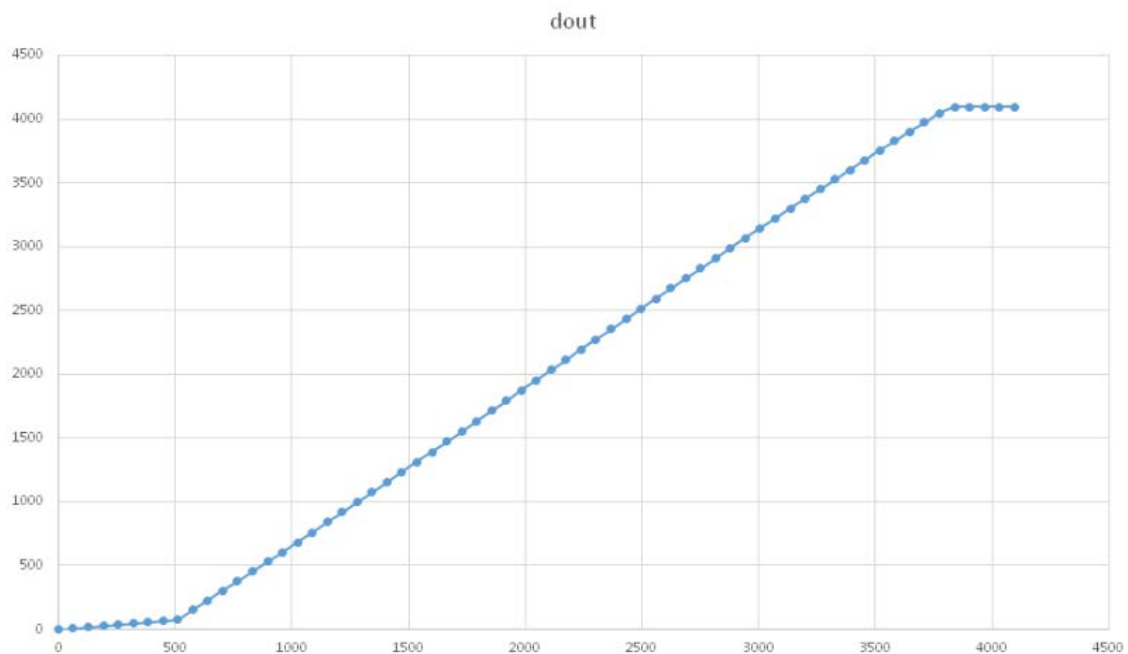
Figure 13: Image transfer for a value of 1.
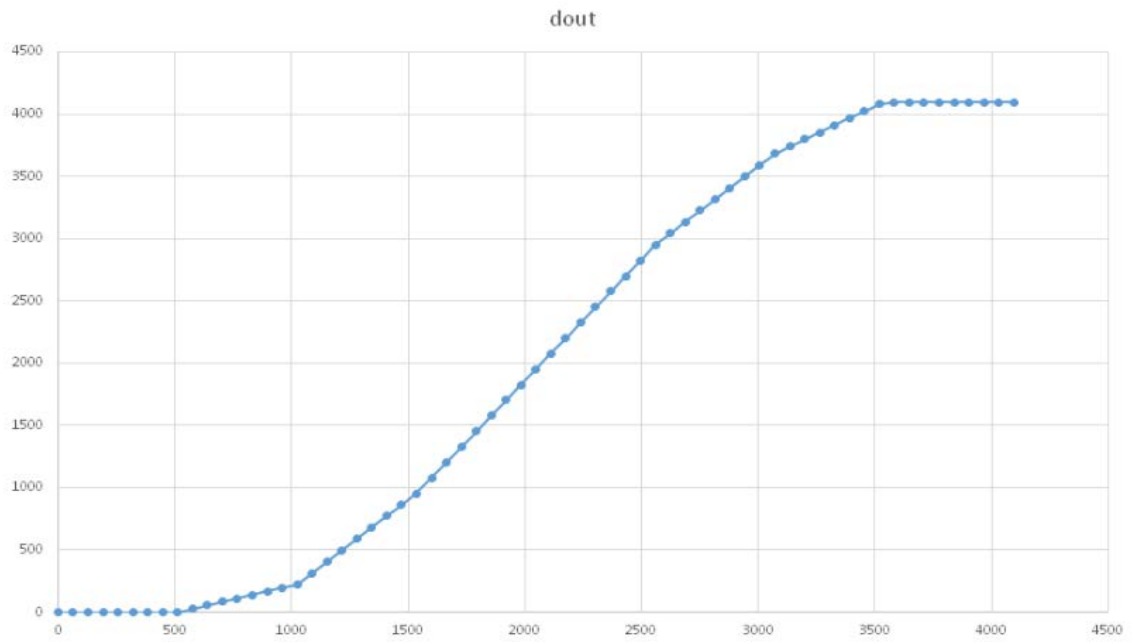
Figure 14: Image transfer for a value of 9.

ImageProcessingControl (category continued)

The feature descriptions for the `/ImageProcessingControl/ContrastControl` subcategory have ended on the previous page. The following features continue the `/ImageProcessingControl` category, without a subcategory.

ConvolutionMode

Selects the convolution filter to process the image.

Various filters enable to reduce image noise, emphasize the edges of an image, or to perform individual image processing.

Interface support	All
Display name	Convolution Mode
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	AdaptiveNoiseSuppression, CustomConvolutionValue, Sharpness
Category	/ImageProcessingControl

Values	Description
AdaptiveNoiseSuppression	To reduce noise while keeping the edges, the adaptive noise suppression is selected, (controlled by `AdaptiveNoiseSuppressionFactor`).
CustomConvolution	Your individual settings defined in `CustomConvolutionValue` are selected.
Off	The feature is disabled (default).
Sharpness	To increase the contrast of edges, the sharpness mode is selected, (controlled by `Sharpness`).

CustomConvolutionValue

[CustomConvolutionValueSelector]

Sets the value for the convolution filter selected by
`CustomConvolutionValueSelector`.

Interface support	All
Display name	Custom Convolution Value
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ImageProcessingControl

Values	Description
0	Minimum value
255	Maximum value

CustomConvolutionValueSelector

Defines the position to read from or write to the selceted *CustomConvolution* filter, using `CustomConvolutionValue`.

Interface support	All
Display name	Custom Convolution Value Selector
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	AdaptiveNoiseSuppressionFactor, CustomConvolutionValue, Sharpness
Category	/ImageProcessingControl

Values	Description
Coefficient 00...04	Selects coefficients from 00 to 04.
Coefficient 10...14	Selects coefficients from 10 to 14.
Coefficient 20...24	Selects coefficients from 20 to 24.
Coefficient 30...34	Selects coefficients from 30 to 34.

	0	1	2	3	4
0	00	01	02	03	04
1	10	11	12	13	14
2	20	21	22	23	24
3	30	31	32	33	34
4	40	41	42	43	44

Figure 15: Matrix for coefficient values

Sharpness

Selects the degree of sharpness or blurring of the image.

Interface support	All
Display name	Sharpness
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ImageProcessingControl

Values	Description
-12	Maximum blurring is applied.
0	The image is not affected (default).
12	Maximum sharpness is applied.

LUTControl

The features in this category can be used to change intensity values, adjusted by luminance and RGB color channels.

Interface support	All
Display name	LUT Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

LUTEnable
[LUTSelector]

Enables or disables the selected LUT.

Interface support	All
Display name	LUT Enable
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	LUTIndex, LUTValue
Category	/LUTControl

Values	Description
False	The selected LUT is disabled.
True	The selected LUT is enabled.

LUTIndex

[LUTSelector]

Controls the index (offset) of the coefficient to access in the selected LUT.

Interface support	All
Display name	LUT Index
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	LUTValue
Category	/LUTControl

Values	Description
0	Minimum
4095	Maximum

LUTSelector

Selects the LUT to be controlled.

Interface support	All
Display name	LUT Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	LUTEnable, LUTIndex, LUTValue
Category	/LUTControl

Values	Description
Blue	The LUT for blue is selected.
Green	The LUT for green is selected.
Luminance	The LUT for luminance is selected.
Red	The LUT for red is selected.

LUTValue

[LUTSelector][LUTIndex]

Controls the value for the selected LUT.

Interface support	All
Display name	LUT Value
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not affected
Category	/LUTControl

Values	Description
0	Minimum
4095	Maximum

LUTValueAll

[LUTSelector]

Controls all the LUT coefficients in a single access without using individual `LUTIndex`. This can be used to write values for red, green, or blue at once.

Notes
- Monochrome cameras support only *Luminance*, not RGB.
- One LUT entry is 12 bit, so 1 value occupies 2 Bytes (8192 elements) in the Raw data array.
- Values can be read and written at the same time.

Interface support	All
Display name	LUT Value All
Standard	SFNC
Origin of feature	Camera
Feature type	Raw
Access	R/W
Affected features	Not affected
Category	/LUTControl

PtpControl

Note: Features in this category are available for Alvium GigE cameras only.

The features in this category can be used to synchronize your camera, for example, with other cameras.

Interface support	GigE
Display name	Ptp Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

PtpClockAccuracy

Displays the expected accuracy of the camera's PTP clock when it is the grandmaster, or in the event it becomes the grandmaster.

Interface support	GigE
Display name	Ptp Clock Accuracy
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/PtpControl

Values	Description
Unknown	The accuracy cannot be stated (default).

PtpClockID

Displays the latched **parent** clock ID of the PTP device (=camera).

Interface support	GigE
Display name	Ptp Clock ID
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/PtpControl

Values	Description
0	Minimum
9223372036854775807	Maximum

PtpDataSetLatch

Latches the current values from the camera's PTP clock data set.

Interface support	GigE
Display name	Ptp Data Set Latch
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	Not applicable
Category	/PtpControl

PtpEnable

Enable or disables using the Precision Time Protocol (PTP).

Interface support	GigE
Display name	Ptp Enable
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	Not applicable
Category	/PtpControl

Values	Description
False	PTP is disabled (default).
True	PTP is enabled.

PtpGrandmasterClockID

Displays the latched **grandmaster** clock ID of the PTP device (=camera).

Interface support	GigE
Display name	Ptp Grandmaster Clock ID
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/PtpControl

Values	Description
0	Minimum
9223372036854775807	Maximum

PtpOffsetFromMaster

Displays the latched offset from the PTP master clock.

Interface support	GigE
Display name	Ptp Offset From Master
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	ns (nanoseconds)
Affected features	Not applicable
Category	/PtpControl

Values	Description
-2147483648	Minimum
2147483647	Maximum

PtpOperationMode

Controls the IEEE 1588 operation mode.

Interface support	GigE
Display name	Ptp Operation Mode
Standard	Custom
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/PtpControl

Values	Description
Auto	The status for the camera is set automatically.
Master	Sets the camera to be master.
Slave	Sets the camera to be slave.

PtpParentClockID

Displays the latched **parent** (=current master) clock ID of the PTP device (=camera).

Interface support	GigE
Display name	Ptp Parent Clock ID
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/PtpControl

Values	Description
0	Minimum
9223372036854775807	Maximum

PtpServoStatus

Displays the latched state of the PTP Servo Clock.

PTP accuracy

The average accuracy for PTP is 12 µs.

- **Typical PTP lock type** with Alvium cameras:
  Floating lock state in cycles: *Idle* > *Locked* > *Stepchange*
  Average offset from Master: < 12 µs
- **Other PTP lock type** with Alvium cameras (temporary, cannot be forced):
  Strong lock state: *Locked*.
  Average offset from Master: < 1 µs

Interface support	GigE
Display name	Ptp Servo Status
Standard	SFNC adapted
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/PtpControl

Values	Description
ClockChange	The status of the clock frequency configuration is changed. This occurs when there is a big difference between master and slave clock frequency.
Idle	The status of the clock controller is in idle state (waiting for all data collection).
Locked	The status of the clock controller is in adjusting state, the PI controller is used to follow the master clock drift.
StepChange	The status of the clock counter is changed step-by-step.
Unknown	The status of the clock controller is set to Unknown (for example, if the camera works as a Master).

PtpStatus

Displays the PTP status.

Interface support	GigE
Display name	Ptp Status
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/PtpControl

Values	Description[1]
1	Initializing
2	Faulty
3	Disabled
4	Listening
5	Pre Master
6	Master
7	Passive
8	Uncalibrated
9	Slave

[1]Refer to the IEEE 1588-2008 specification for additional information on PTP states.

SequencerControl

Note: Features in this category are available for Alvium 1800 U and GigE cameras with Sony IMX global shutter sensors only. The support for Alvium CSI-2 is intended for a future firmware release. The features in this category can be used to trigger camera feature settings in sequencer sets (**"set" on this page**) during acquisition in a predefined order.

Interface support	GigE, USB
Display name	Sequencer Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

Functional overview

`SequencerSetSelector` is used to load and save the sets.

Configuring the feature adjustments in a set

- `SequencerFeatureSelector` displays features to be enabled or disabled for sequencing.
- `SequencerFeatureEnable[SequencerFeatureSelector]` displays if a feature can be used for sequencing.
- `SequencerConfigurationMode` enables the configuration of sets.
- `SequencerSetSelector` selects the set to be loaded or saved.
- `SequencerSetSave[SequencerSetSelector]` stores settings on the camera.
- `SequencerSetLoad[SequencerSetSelector]` reads or activates stored sets.

Configuring the triggering between sets

- `SequencerSetStart` controls the initial set to be activated. The default value is 0, it is not included in the 8 paths defined by the features below.
- `SequencerPathSelector[SequencerSetSelector]` offers 8 different paths (higher IDs = indices have the higher priority) with 3 parameters to activate sequencer sets:
  - `TriggerSource`
  - `TriggerActivation`
  - `SequencerSetNext`
- `SequencerSetNext[SequencerSetSelector][SequencerPathSelector]` controls the set to be activated after the current set.
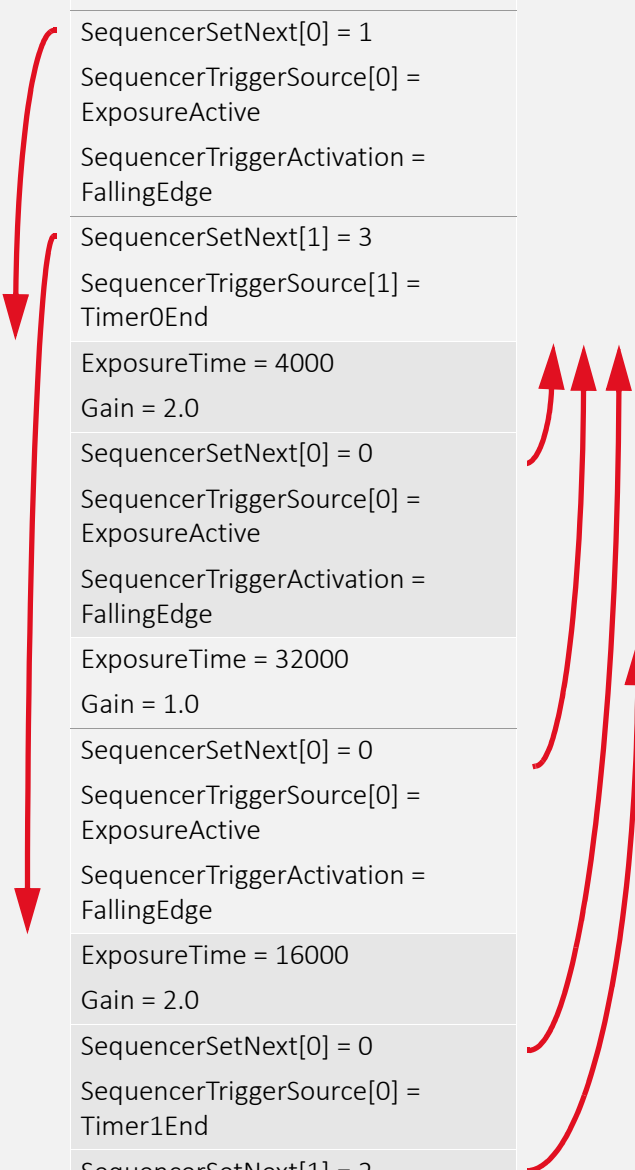
Controlling triggers to activate sets

- `SequencerTriggerSource[SequencerSetSelector]` `[SequencerPathSelector]` selects the trigger source to activate a set.
- `SequencerTriggerActivation[SequencerSetSelector]` `[SequencerPathSelector]` selects the activation mode for triggering a set.

Pseudo code example

The following example reuses content of the SFNC V2.4 document. 4 sequencer sets are used to adjust `ExposureTime` and `Gain`. The end of exposure triggers the next sequencer. In parallel, two timers trigger sequencers.

Set	Code example		Description
0	ExposureTime = 4000 Gain = 1.0		Initial settings for ExposureTime and Gain are adjusted.
	SequencerSetNext[0] = 1 SequencerTriggerSource[0] = ExposureActive SequencerTriggerActivation = FallingEdge		ExposureEnd triggers SequencerSet1.
	SequencerSetNext[1] = 3 SequencerTriggerSource[1] = Timer0End		Timer0End triggers SequencerSet3.
1	ExposureTime = 4000 Gain = 2.0		Settings for ExposureTime and Gain are changed.
	SequencerSetNext[0] = 0 SequencerTriggerSource[0] = ExposureActive SequencerTriggerActivation = FallingEdge		ExposureEnd triggers SequencerSet0.
2	ExposureTime = 32000 Gain = 1.0		Settings for ExposureTime and Gain are changed.
	SequencerSetNext[0] = 0 SequencerTriggerSource[0] = ExposureActive SequencerTriggerActivation = FallingEdge		ExposureEnd triggers SequencerSet0.
3	ExposureTime = 16000 Gain = 2.0		Settings for ExposureTime and Gain are changed.
	SequencerSetNext[0] = 0 SequencerTriggerSource[0] = Timer1End		Timer1End triggers SequencerSet0.
	SequencerSetNext[1] = 2 SequencerTriggerSource[1] = Timer0End		Timer0End triggers SequencerSet2.

SequencerConfigurationMode

Enables or disables configuration of the sequencer.

Interface support	GigE, USB
Display name	Sequencer Configuration Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`ExposureAutoMin, ExposureAutoMax`
Category	/SequencerControl

Values	Description
Off	Configuration of the sequencer is disabled (default).
On	Configuration of the sequencer is enabled.

SequencerFeatureEnable

[SequencerFeatureSelector]

Displays which feature can be used in sequencer sets.

Interface support	GigE, USB
Display name	Sequencer Feature Enable
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R
Affected features	Not applicable
Category	/SequencerControl

Values	Description
False	The selected feature is disabled (default).
True	The selected feature is enabled.

SequencerFeatureSelector

Selects the features to be included in the corresponding sequencer sets.

Interface support	GigE, USB
Display name	Sequencer Feature Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable,
Category	/SequencerControl

Values

`AcquisitionFrameRate, AcquisitionFrameRateEnable, BalanceRatio,`
`BinningHorizontal, BinningVertical, ChunkEnable,`
`ChunkModeActive, ColorTransformationEnable,`
`ColorTransformationValue, ExposureTime, Gain, Gamma, Height, Hue,`
`OffsetX, OffsetY, PayloadSize, PixelFormat, Saturation,`
`SequencerSetNext, SequencerTriggerActivation,`
`SequencerTriggerSource, Width`

SequencerMode

Enables or disables the sequencer.

Interface support	GigE, USB
Display name	Sequencer Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`PayloadSize`
Category	/SequencerControl

Values	Description
Off	The sequencer is disabled (default).
On	The sequencer is enabled.

SequencerSetActive

Displays the index of the currently active sequencer set.

Interface support	GigE, USB
Display name	Sequencer Set Active
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SequencerControl

Values	Description
0	Minimum
4294967295	Maximum

SequencerSetLoad

[SequencerSetSelector]

Loads and activates the sequencer set selected by `SequencerSetSelector`.

Note: Even if `SequencerMode` is *Off*, the configuration of the selected sequencer is activated on the camera.

Interface support	GigE, USB
Display name	Sequencer Set Load
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	`AcquisitionFrameRate, AcquisitionFrameRateEnable, BalanceRatio, BinningHorizontal, BinningVertical, ChunkEnable, ChunkModeActive, ColorTransformationEnable, ColorTransformationValue, ExposureTime, Gain, Gamma, Height, Hue, OffsetX, OffsetY, PayloadSize, PixelFormat, Saturation, SequencerSetNext, SequencerTriggerActivation, SequencerTriggerSource, Width`
Category	/SequencerControl

SequencerSetSave
[SequencerSetSelector]

Saves the sequencer set selected by `SequencerSetSelector`.

Note: Even if `SequencerMode` is *Off*, the selected set is saved.

Interface support	GigE, USB
Display name	Sequencer Set Save
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	See `SequencerSetLoad`.
Category	/SequencerControl

SequencerSetSelector

Selects the sequencer set to be configured or used.

Interface support	GigE, USB
Display name	Sequencer Set Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	See `SequencerSetLoad`.
Category	/SequencerControl

Values	Description
Set0	Set0 is selected (default).
Set1	Set1 is selected.
...	...
Set15	Set15 is selected.

SequencerSetStart

Selects the sequencer set to start with.

Note: The sequencer set selected by **SequencerSetStart**equencer is the initial sequencer set, including sets grouped in paths. See SequencerPathControl (subcategory) on page 237.

Interface support	GigE, USB
Display name	Sequencer Set Start
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/SequencerControl

Values	Description
0	Minimum
15	Maximum

SequencerPathControl (subcategory)

Note: Features in this subcategory are available for the following Alvium cameras with Sony IMX global shutter sensors only:

- Alvium 1800 U
- Alvium GigE cameras

The support for Alvium CSI-2 is intended for a future firmware release.

The features in this subcategory can be used to configure the Sequencer Paths of sequencer sets to be triggered.

Interface support	GigE, USB
Display name	Sequencer Path Control
Standard	Custom
Origin of feature	Camera
Feature type	(Subcategory)
Category	/SequencerControl

SequencerPathSelector

[SequencerSetSelector]

Selects the SequencerPath including the sequencer sets to be configured or used.

Interface support	GigE, USB
Display name	Sequencer Path Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`SequencerSetNext`, `SequencerTriggerSource`, `SequencerTriggerActivation`
Category	/SequencerControl/SequencerPathControl

Values	Description
Path0	Path0 is selected to be configured (default).
Path1	Path1 is selected to be configured.
...	...
Path7	Path7 is selected to be configured.

SequencerSetNext

[SequencerSetSelector][SequencerPathSelector]

Selects the next sequencer set to be configured or used.

Interface support	GigE, USB
Display name	Sequencer Set Next
Standard	SFNC (adapted)
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	`SequencerSetNext`, `SequencerTriggerSource`, `SequencerTriggerActivation`
Category	/SequencerControl/SequencerPathControl

Values	Description
0	Minimum value
15	Maximum value

SequencerTriggerActivation

[SequencerSetSelector][SequencerPathSelector]

Selects the electrical signal level to trigger the corresponding sequencer set.

Interface support	GigE, USB
Display name	Sequencer Trigger Activation
Standard	SFNC (adapted)
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/SequencerControl/SequencerPathControl

Values	Description
AnyEdge	The sequencer is triggered on the falling or rising edge of the signal.
FallingEdge	The sequencer is triggered on the falling edge of the signal.
LevelHigh	The sequencer is triggered at a high signal level.
LevelLow	The sequencer is triggered at a low signal level.
RisingEdge	The sequencer is triggered on the rising edge of the signal.

SequencerTriggerSource

[SequencerSetSelector][SequencerPathSelector]

Selects the internal signal or physical input line to use as source for triggering the sequencer.

Note: The selected trigger must have its `TriggerMode` set to *On*.

Interface support	GigE, USB
Display name	Sequencer Trigger Source
Standard	SFNC (adapted)
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AcquisitionControl

Values	Description *(sheet 1 of 2)*
Action0[1]	The Action0 command is output as source signal.
Action1[1]	The Action1 command is output as source signal.
Counter0Active	The `Counter0Active` signal triggers the sequencer.
Counter1Active	The `Counter1Active` signal triggers the sequencer.
Counter2Active	The `Counter2Active` signal triggers the sequencer.
Counter3Active	The `Counter3Active` signal triggers the sequencer.
ExposureActive[2]	The `ExposureActive` signal triggers the sequencer.
FrameActive	The `FrameActive` signal triggers the sequencer.
Line0	Physical Line0 triggers the sequencer.
Line1	Physical Line1 triggers the sequencer.
Line2[3]	Physical Line2 triggers the sequencer.
Line3[3]	Physical Line3 triggers the sequencer.
Off	Triggering is disabled.
SoftwareSignal0	SoftwareSignal0 triggers the sequencer.
SoftwareSignal1	SoftwareSignal1 triggers the sequencer.

[1] Currently, available with Alvium G1/G5 cameras only.

[2] Available for cameras with global shutter sensors and with rolling shutter senors if TriggerMode is enabled or if AcquisitionMode is set to Continuous.

[3] Available with Alvium G1/G5 and Alvium USB cameras. Alvium CSI-2 cameras support Line0 and Line1 only.

Table 8: SequencerTriggerSource values (sheet 1 of 2)

Values	Description *(sheet 2 of 2)*
`...N`	SoftwareSignalN triggers the sequencer.
`Timer0Active`	The `Timer0Active` signal triggers the sequencer.
`Timer1Active`	The `Timer1Active` signal triggers the sequencer.

[1] Currently, available with Alvium G1/G5 cameras only.

[2] Available for cameras with global shutter sensors and with rolling shutter senors if TriggerMode is enabled or if AcquisitionMode is set to Continuous.

[3] Available with Alvium G1/G5 and Alvium USB cameras. Alvium CSI-2 cameras support Line0 and Line1 only.

Table 8: SequencerTriggerSource values (sheet 2 of 2)

SoftwareSignalControl

The features in this category can be used by external devices to trigger actions within the camera by software commands.

See ActionControl on page 106 for the interaction with features in this category.

Interface support	All
Display name	Software Signal Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

SoftwareSignalPulse

[SoftwareSignalSelector]

Generates a pulse signal used by external devices to trigger actions within the camera by software commands.

Interface support	All
Display name	Software Signal Pulse
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	Not applicable
Category	/SoftwareSignalControl

SoftwareSignalSelector

Selects which Software Signal features to control.

Interface support	All
Display name	Software Signal Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	SoftwareSignalPulse
Category	/SoftwareSignalControl

Values	Description
SoftwareSignal0	Selects software signal 0 (default).
SoftwareSignal1	Selects software signal 1.

TestControl

The feature in this category can be used to test if packets are transmitted successfully between the host and the camera.

Interface support	All
Display name	Test Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

TestPendingAck

Tests the camera's pending acknowledge feature. When this feature is written, the camera waits a time period corresponding to the value of `TestPendingAck` before acknowledging the write.

Note: If you select a high value, the camera does not respond for a long time.

Interface support	All
Display name	Test Pending Ack
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	ms
Affected features	Not applicable
Category	/TestControl

Values	Description
0	Minimum
60000	Maximum

TransferControl

Note: Features in this category are available for Alvium GigE cameras only. Support for the other Alvium series is intended for a future firmware release.

The features in this category can be used to acquire a sequence of images as a burst.

Interface support	GigE
Display name	Transfer Control
Standard	SFNC adapted
Origin of feature	Camera
Feature type	(Category)

TransferControlMode

[TransferSelector]

Enables or disables image acquisition as burst.

Interface support	GigE
Display name	Transfer Control Mode
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	AcquisitionFrameRate
Category	/TransferControl

Values	Description
Automatic	The image burst is enabled
Basic	The image burst is disabled (default).*

TransferQueueCurrentBlockCount

[TransferSelector]

Displays the current number of images in the frame buffer.

Interface support	GigE
Display name	Transfer Queue Current Block Count
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Bytes
Affected features	Not applicable
Category	/TransferControl

Values	Description
0	Minimum
4294967295	Maximum

TransferQueueMaxBlockCount

[TransferSelector]

Controls the maximum number of images that can be stored in the frame buffer.

Interface support	GigE
Display name	Transfer Queue Max Block Count
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Unit	Bytes
Affected features	Not applicable
Category	/TransferControl

Values	Description
0	Minimum
4294967295	Maximum

TransferSelector

Selects the stream to be configured by Transfer Control features. Use as a reference for your host software.

Interface support	GigE
Display name	Transfer Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	`AcquisitionFrameRate`, `TransferControlMode`, `TransferQueueCurrentBlockCount`, `TransferQueueMaxBlockCount`
Category	/TransferControl

Values	Description
Stream0	Stream 0 is selected.

TransportLayerControl

The features in this category can be used to display the current bandwidth use and the transfer status of packets between the host and the camera on the transport layer level.

Interface support	All
Display name	Transport Layer Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

GigEVision

Note: Features in this subcategory are available for Alvium GigE cameras only.

The features in this subcategory can be used to control IP settings, the communication between the host and the camera, and the transfer of data packets.

Interface support	GigE
Display name	GigE
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)
Category	/TransportLayerControl

GevCurrentDefaultGateway

Displays the current default gateway address.

Interface support	GigE
Display name	Gev Current Default Gateway
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/TransportLayerControl/GigEVision

GevCurrentIPAddress

Displays the current IP address.

Interface support	GigE
Display name	Gev Current IP Address
Standard	SFNC adapted
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/TransportLayerControl/GigEVision

Priorities for assigning IP addresses

Figure 16 shows the workflow to assign IP addresses to cameras according to the GigE Vision standard:
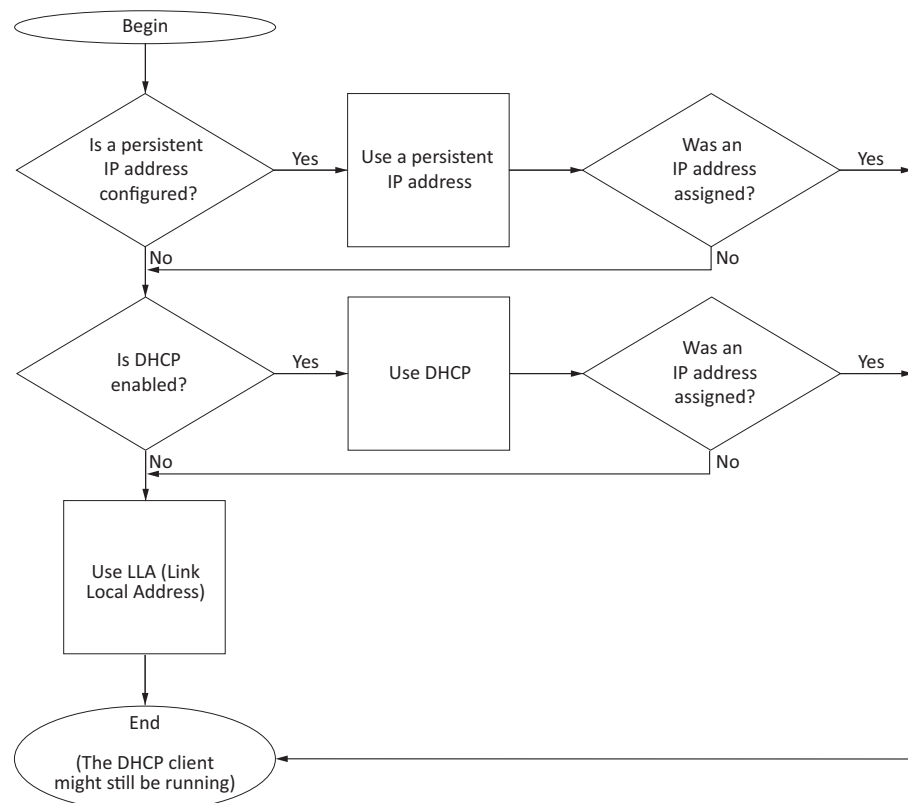
Figure 16: Priorities for assigning IP addresses

GevCurrentIPConfigurationDHCP

Enables or disables IP settings being configured by DHCP.

Interface support	GigE
Display name	Gev Current IP Configuration DHCP
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	Not applicable
Category	/TransportLayerControl/GigEVision

Values	Description
True	IP settings are configured by DHCP (dynamic host configuration protocol) (default).
False	IP settings are configured by LLA or by the user (persistent IP).

Priorities for assigning IP addresses

See the flowchart in Figure 16: Priorities for assigning IP addresses on page 248 for the priorities between `GevCurrentIPConfigurationPersistentIP`, `GevCurrentIPConfigurationDHCP`, and `GevCurrentIPConfigurationLLA`.

GevCurrentIPConfigurationLLA

Enables or disables IP settings being configured by LLA.

Interface support	GigE
Display name	Gev Current IP Configuration LLA
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	Not applicable
Category	/TransportLayerControl/GigEVision

Values	Description
True	IP settings are configured by LLA (link-local address) (default).

Priorities for assigning IP addresses

See the flowchart in for the priorities between `GevCurrentIPConfigurationPersistentIP`, `GevCurrentIPConfigurationDHCP`, and `GevCurrentIPConfigurationLLA`.

GevCurrentIPConfigurationPersistentIP

Enables or disables IP settings being configured by manually by the user.

Interface support	GigE
Display name	Gev Current IP Configuration Persistent IP
Standard	SFNC
Origin of feature	Camera
Feature type	Boolean
Access	R/W
Affected features	`GevCurrentIPConfigurationDHCP,` `GevIPConfigurationStatus`
Category	/TransportLayerControl/GigEVision

Values	Description
True	IP settings are configured manually by the user.
False	IP settings are configured by LLA or DHCP (default).

Priorities for assigning IP addresses

See the flowchart in Figure 16: Priorities for assigning IP addresses on page 248 for the priorities between `GevCurrentIPConfigurationPersistentIP`, `GevCurrentIPConfigurationDHCP`, and `GevCurrentIPConfigurationLLA`.

GevCurrentSubnetMask

Displays the current subnet mask address.

Interface support	GigE
Display name	Gev Current Subnet Mask
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/TransportLayerControl/GigEVision

GevIPConfigurationStatus

Displays if IP settings are configured by DHCP, LLA, or manually by the user.

Interface support	GigE
Display name	Gev IP Configuration Status
Standard	SFNC adapted
Origin of feature	Camera
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/TransportLayerControl/GigEVision

Values	Description
DHCP	IP settings are configured by DHCP (dynamic host configuration protocol) (default). If no DHCP server is found, DHCP falls back to LLA automatically i.
LLA	IP settings are configured by LLA (link-local address).
Persistent	IP settings are configured manually by the user.

Priorities for assigning IP addresses

See the flowchart in Figure 16: Priorities for assigning IP addresses on page 248 for the priorities between GevCurrentIPConfigurationPersistentIP, GevCurrentIPConfigurationDHCP, and GevCurrentIPConfigurationLLA.

GevMACAddress

Displays the current MAC address.

Interface support	GigE
Display name	Gev MAC Address
Standard	SFNC adapted
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/TransportLayerControl/GigEVision

GevPersistentDefaultGateway

Selects the default gateway address.

Interface support	GigE
Display name	Gev Persistent Default Gateway
Standard	SFNC adapted
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/TransportLayerControl/GigEVision

GevPersistentIPAddress

Selects the IP address.

Interface support	GigE
Display name	Gev Persistent IP Address
Standard	SFNC adapted
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/TransportLayerControl/GigEVision

GevPersistentSubnetMask

Selects the subnet mask address.

Interface support	GigE
Display name	Gev Persistent Subnet Mask
Standard	SFNC adapted
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/TransportLayerControl/GigEVision

GevSCPSPacketSize

Controls the stream packet size to be transmitted on the selected channel for a GVSP transmitter.

Displays the maximum packet size supported by a GVSP receiver.

Notes:

- The following data is excluded: Data leader, data trailer, the last data packet (which might be of smaller size because the packet size is not necessarily a multiple of block size for stream channel).
- If cameras cannot support the requested packet size, they must not fire test packets when requested to do so.
- `DeviceStreamChannelPacketSize` is updated after writing to `GevSCPSPacketSize`.

Interface support	GigE
Display name	Gev SCPS Packet Size
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	`DeviceStreamChannelPacketSize`
Category	/TransportLayerControl/GigEVision

TransportLayerControlControl (category continued)

The feature descriptions for the `/TransportLayerControl/GigEVision` category have ended on the previous page. The following features continue the `/TransportLayerControl` category, without a subcategory.

PayloadSize

Displays the number of bytes transferred for each image or chunk on the stream channel. This includes any end-of-line, end-of-frame statistics, or other stamp data. Therefore, the feature displays the total size of data payload for a data block.

Interface support	All
Display name	Payload Size
Standard	SFNC
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Bytes
Affected features	Not applicable
Category	/TransportLayerControl

Values	Description
0	Minimum

Info (subcategory)

Note: Features in this subcategory are available for Alvium CSI-2 cameras only.

The features in this subcategory can be used to display the transfer status of packets between the host and the camera on the transport layer level.

Interface support	CSI-2
Display name	Info
Standard	Custom
Origin of feature	Transport layer
Feature type	Subcategory
Category	/TransportLayerControl

CSI2ClockFrequency

Displays the MIPI CSI-2 clock frequency.

Interface support	CSI-2
Display name	CSI-2 Clock Frequency
Standard	Custom
Origin of feature	Transport layer
Feature type	Float
Access	R
Unit	Hz [Hertz]
Affected features	Not applicable
Category	/TransportLayerControl/Info

CSI2DriverInterfaceVersion

Displays the version of the MIPI CSI-2 interface.

Interface support	CSI-2
Display name	CSI-2 Driver Interface Version
Standard	Custom
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/TransportLayerControl/Info

CSI2LaneCount

Displays the number of used MIPI CSI-2 lanes.

Interface support	CSI-2
Display name	CSI-2 Lane Count
Standard	Custom
Origin of feature	Transport layer, camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/TransportLayerControl/Info

LibcsiVersion

Displays the libcsi version.

Interface support	CSI-2
Display name	libcsi Version
Standard	Custom
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/TransportLayerControl/Info

CSI2DriverVersion

Displays the version of the MIPI CSI-2 driver.

Interface support	CSI-2
Display name	CSI-2 Driver Version
Standard	Custom
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/TransportLayerControl/Info

PacketCount

Displays the number of MIPI CSI-2 packets per frame.

Interface support	CSI-2
Display name	Packet Count
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/TransportLayerControl/Info

Values	Description
0	Minimum
4294967295	Maximum

PacketSize

Displays the size of MIPI CSI-2 packets.

Interface support	CSI-2
Display name	Packet Size
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R
Unit	Bytes
Affected features	Not applicable
Category	/TransportLayerControl/Info

Values	Description
0	Minimum
4294967295	Maximum

UserSetControl

The features in this category enable to store and select user-specific camera settings, or to revert the camera to defined settings.

User sets can be loaded by default, without needing to set values by software after every restart of the camera. Or they can be used to switch between different settings, for example, to adjust from daylight to artificial light.

Supported features

User sets on Alvium cameras support all features except for:

- Selectors
- Command features
- Read-only features
- Features that do not apply to the corresponding interface, such as CSI-2 related features on a USB camera
- Features in the `LUTControl` category.

Interface support	All
Display name	User Set Control
Standard	SFNC
Origin of feature	Camera
Feature type	(Category)

UserSetDefault

Selects the user set to be loaded by default when the camera is reset.

Interface support	All
Display name	User Set Default
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/UserSetControl

Value	Description
Default	The default user set is loaded at camera reset.
UserSet1	Your individual UserSet1 is loaded at camera reset.
UserSet2	Your individual UserSet2 is loaded at camera reset.
UserSet3	Your individual UserSet3 is loaded at camera reset.
UserSet4	Your individual UserSet4 is loaded at camera reset.

UserSetLoad

[UserSetSelector]

Loads the user set specified by `UserSetSelector` to the camera.

Interface support	All
Display name	User Set Load
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	All features that are not excluded from user sets. See your Alvium camera's user guide for exceptions.
Category	/UserSetControl

UserSetSave

[UserSetSelector]

Writes and saves the current setup and state of the camera to the user set specified by `UserSetSelector`.

Interface support	All
Display name	User Set Save
Standard	SFNC
Origin of feature	Camera
Feature type	Command
Access	W
Affected features	All features that are not excluded from user sets. See your Alvium camera's user guide for exceptions.
Category	/UserSetControl

UserSetSelector

Selects the user set to be loaded or saved.

Interface support	All
Display name	User Set Selector
Standard	SFNC
Origin of feature	Camera
Feature type	Enumeration
Access	R/W
Affected features	UserSetLoad, UserSetSave
	All features that are not excluded from user sets. See your Alvium camera's user guide for exceptions.
Category	/UserSetControl

Value	Description
Default	The default user set is selected.
UserSet1	Your individual UserSet1 set is selected.
UserSet2	Your individual UserSet2 set is selected.
UserSet3	Your individual UserSet3 set is selected.
UserSet4	Your individual UserSet4 set is selected.

Allied Vision

Feature descriptions: Stream 0

This chapter includes:

You need experience to use these features

We recommend you to use features in this category only if you are an advanced user.

BufferHandlingControl

Stream 0 as GenTL Module

Current Alvium cameras use Stream0 only.

The features in this category can be used to control the buffers in the acquisition engine of the data stream.

Interface support	All (most features)
Display name	Buffer Handling Control
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

MaxDriverBuffersCount

Controls the maximum number of driver buffers used by the acquisition engine.

Note: We recommend you to use this feature only if you are an advanced user.

Interface support	CSI-2, USB
Display name	Max Driver Buffers Count
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/BufferHandlingControl

Values	Description
1	Minimum
4096	Maximum
1	Increment

StreamAnnounceBufferMinimum

Displays the minimum number of buffers to announce to enable selected buffer handling mode. Corresponds to the `STREAM_INFO_BUF_ANNOUNCE_MIN` command of `DSGetInfo` function.

Note: We recommend you to use this feature only if you are an advanced user.

Interface support	All
Display name	Stream Announce Buffer Minimum
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/BufferHandlingControl

StreamAnnouncedBufferCount

Displays the number of announced (known) buffers on this stream. Corresponds to the `STREAM_INFO_NUM_ANNOUNCED` command of `DSGetInfo` function.

Note: We recommend you to use this feature only if you are an advanced user.

Interface support	All
Display name	Stream Announced Buffer Count
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/BufferHandlingControl

Values	Description
0	Minimum
9223372036854775807	Maximum

StreamBufferHandlingMode

Selects the available acquisition modes of the stream.

Note: We recommend you to use this feature only if you are an advanced user.

Interface support	All
Display name	Stream Buffer Handling Mode
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Enumeration
Access	R
Affected features	StreamAcquisitionModeSelector
Category	/BufferHandlingControl

Value	Description
Default	Default stream buffer handling is available.

Stream

Note: Features in this category are available for Alvium GigE cameras only.

The features in this category can be used to control data traffic between the host and the camera. This includes functions to avoid dropped frames. `MultiCast` can be used to synchronize the timing between cameras.

Interface support	GigE
Display name	Stream
Standard	Custom
Origin of feature	Transport layer
Feature type	(Category)

Info (subcategory)

Note: Features in this subcategory are available for Alvium GigE cameras only.

The features in this subcategory can be used to display the MAC address of the camera and the version of the filter version for the GigE Vision Streaming Protocol.

Interface support	GigE
Display name	Info
Standard	Custom
Origin of feature	Transport layer
Feature type	(Subcategory)
Category	/Stream

GVSPFilterCompatibility

Displays the compatibility of the transport layer and the found GVSP filter driver.

Interface support	GigE
Display name	GVSP Filter Compatibility
Standard	Custom
Origin of feature	Transport layer
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/Stream/Info

Values	Description
Matching	The transport layer and the GVSP filter driver are compatible.
TLOutdated	The filter driver is newer than expected by the transport layer, but it is compatible.
DriverOutdated	The filter driver is older than expected by the transport layer, but it is compatible.
Incompatible	The transport layer and the filter driver are not compatible. The filter driver cannot be used for streaming.
Disabled	The filter driver is installed on the system but it is not enabled for the network adapter.

GVSPFilterVersion

Displays the GVSP filter version.

Interface support	GigE
Display name	GVSP Filter Version
Standard	Custom
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/Stream/Info

Multicast (subcategory)

Note: Features in this subcategory are available for Alvium GigE cameras only.

The features in this subcategory enable synchronizing the timing between cameras.

Interface support	GigE
Display name	Multicast
Standard	Custom
Origin of feature	Transport layer
Feature type	(Subcategory)
Category	/Stream

MulticastEnable

Enables or disables multicast.

Interface support	GigE
Display name	Multicast Enable
Standard	Custom
Origin of feature	Transport layer
Feature type	Boolean
Access	R/W
Affected features	Not applicable
Category	/Stream/Multicast

Values	Description
False	Disables multicast.
True	Enables multicast.

MulticastIPAddress

Selects the IP address of the target multicasting group. The Multicast transport layer protocol enables multiple cameras to use IP connections most effectively by sending packets to many receivers at the same time.

Interface support	GigE
Display name	Multicast IP Address
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/Stream/Multicast

Values	Description
224.0.0.0	Minimum value (0xE0.00.00.00 in hexadecimal or 3.758.096.384 in decimal)
239.255.255.255	Maximum value (0xEF.FF.FF.FF in hexadecimal or 4.026.531.839 in decimal)

Settings (subcategory)

Note: Features in this subcategory are available for Alvium GigE cameras only.

The features in this subcategory can be used to control settings for the packet transfer between the host and the camera. `GVSPDriverSelector` enables to select between using the transport layer or the filter driver.

Interface support	GigE
Display name	Settings
Standard	Custom
Origin of feature	Transport layer
Feature type	(Subcategory)
Category	/Stream

GVSPAdjustPacketSize

Request the packet size used to be adjusted automatically.

Interface support	GigE
Display name	GVSP Adjust Packet Size
Standard	Custom
Origin of feature	Transport layer
Feature type	Command
Access	W
Affected features	`GVSPPacketSize, GevSCPSPacketSize, DeviceStreamChannelPacketSize`
Category	/Stream/Settings

GVSPBurstSize

Controls the maximum number of GVSP packets to be processed in a burst.

Interface support	GigE
Display name	GVSP Burst Size
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/Stream/Settings

Values	Description
1	Minimum value
256	Maximum value

GVSPDriverSelector

Selects the streaming driver to be used.

Interface support	GigE
Display name	GVSP Driver Selector
Standard	Custom
Origin of feature	Transport layer
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/Stream/Settings

Values	Description
Filter	Selects the filter drivers stream engine (default).
Socket	Selects the transport layers stream engine.

GVSPHostReceiveBufferSize

Controls the socket buffer space used to receive GVSP packets.

The operating system adjusts the socket buffer continuously. The value may be limited internally by the operating system. See the SO_RCVBUF documentation of the operating system.

Note: This feature cannot be used with the filter driver.

Interface support	GigE
Display name	GVSP Host Receive Buffer Size
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Unit	Bytes
Affected features	Not applicable
Category	/Stream/Settings

GVSPMaxLookBack

Controls the size for the detection of the missing GVSP packets under Windows. This feature can be used to delay the first RESEND_CMD for a missing GVSP packet by X packets.

Interface support	GigE
Display name	GVSP Max Look Back
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/Stream/Settings

Values	Description
1	Minimum value
1024	Maximum value

GVSPMaxRequests

Controls the maximum amount of RESEND_CMDs requested for a missing GVSP packet.

Note: Setting the feature to 0 disables the GigE Vision resend mechanism. The transport layer or filter driver does not request the re-transmission of any missing GVSP packet.

Interface support	GigE
Display name	GVSP Max Requests
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/Stream/Settings

Values	Description
0	Minimum value, disables GigE Vision resend mechanism.
512	Maximum value

GVSPMaxWaitSize

Controls the maximum number of received GVSP packets following a resend request to wait before requesting again. The transport layer or the filter driver waits until `GVSPMaxWaitSize` of packets has been reached before requesting a resend for the same packet again.

Interface support	GigE
Display name	GVSP Max Wait Size
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/Stream/Settings

Values	Description
8	Minimum value
1024	Maximum value

GVSPMissingSize

Controls the maximum number of simultaneously missing GVSP packets before dropping the frame.

You can use this feature to cancel the reception of a single frame if the resend limit `GVSPMaxRequests` is reached for too many packets. The frame is marked as incomplete and returned to the GenTL consumer.

Interface support	GigE
Display name	GVSP Missing Size
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/Stream/Settings

Values	Description
0	Minimum value, disables the feature.
1024	Maximum value

GVSPPacketSize

Controls the total size of a GVSP packet, including the IP, UDP, and GVSP headers.

Interface support	GigE
Display name	GVSP Packet Size
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Unit	Bytes
Affected features	`GevSCPSPacketSize, DeviceStreamChannelPacketSize`
Category	/Stream/Settings

Values	Description
500	Minimum value for Alvium G1
9190	Maximum value for Alvium G1
500	Minimum value for Alvium G5
16358	Maximum value for Alvium G5

GVSPTiltingSize

Controls the maximum number of GVSP packets received from a following frame before dropping the frame.

You can use this feature to cancel the reception of a single frame if a certain number of GVSP packets of the following frame have already been received. The frame is marked as incomplete and returned to the GenTL consumer.

Interface support	GigE
Display name	GVSP Tilting Size
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/Stream/Settings

Values	Description
0	Minimum value, disables the feature.
1024	Maximum value

GVSPTimeout

Controls the timeout used for stream packets.

You can use this feature to react on a possible streaming interruptions. If no GVSP packet is received during the last `GVSPTimeout` milliseconds, the stream engine forces a resend of currently missing GVSP packets.

Interface support	GigE
Display name	GVSP Timeout
Standard	Custom
Origin of feature	Transport Layer
Feature type	Integer
Access	R/W
Unit	Milliseconds [ms]
Affected features	Not applicable
Category	/Stream/Settings

Values	Description
0	Minimum value, disables the feature.
5000	Maximum value

Statistics (subcategory)

Note: Features in this subcategory are available for Alvium GigE cameras only.

The features in this subcategory can be used to display frame rates, streaming duration, and the transfer status of packets between the host and the camera.

Interface support	GigE
Display name	Statistics
Standard	Custom
Origin of feature	Transport layer
Feature type	(Subcategory)
Category	/Stream

StatFrameDelivered

Displays the number of frames that have been delivered to the TL consumer without errors.

Interface support	GigE
Display name	Stat Frame Delivered
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatFrameDropped

Displays the number of frames received by the host that are incomplete due to missing packets.

Note: This does not include shoved frames.

Interface support	GigE
Display name	Stat Frame Dropped
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatFrameRate

Displays the frequency at which the device is sending frames to the host (derived from the frame timestamps).

Interface support	GigE
Display name	Stat Frame Rate
Standard	Custom
Origin of feature	Transport layer
Feature type	Float
Access	R
Unit	Hertz [Hz] (frames per second)
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
1.79769313486e+308	Maximum value

StatFrameRescued

Displays the number of frames that initially had missing packets but were successfully completed after packet resend.

Interface support	GigE
Display name	Stat Frame Rescued
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatFrameShoved

Displays the number of frames dropped because the transfer of a following frame was completed earlier.

Interface support	GigE
Display name	Stat Frame Shoved
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatFrameUnderrun

Displays the number of frames missed due to the non-availability of a user supplied buffer (buffer underrun).

Interface support	GigE
Display name	Stat Frame Underrun
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatLocalRate

Displays the frequency at which the host has received complete and incomplete frames (derived from the host clock).

Interface support	GigE
Display name	Stat Local Rate
Standard	Custom
Origin of feature	Transport layer
Feature type	Float
Access	R
Unit	Hz (frames per second)
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
1.79769313486e+308	Maximum value

StatPacketErrors

Displays the number of received packets that are erroneous.

Interface support	GigE
Display name	Stat Packet Errors
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatPacketMissed

Displays the number of packets expected, but not received by the host.

Note: This does not include successfully resent packets.

Interface support	GigE
Display name	Stat Packet Missed
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatPacketReceived

Displays the number of error-free packets received and processed by the host.

Note: This includes successfully resent packets.

Interface support	GigE
Display name	Stat Packet Received
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatPacketRequested

Displays the number of missing packets that were requested for resend from the camera.

Interface support	GigE
Display name	Stat Packet Requested
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatPacketResent

Displays the number of missing packets that were resent by the camera after having been requested.

Interface support	GigE
Display name	Stat Packet Resent
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatPacketUnavailable

Displays the number of packets that could not be resent by the camera after having been requested.

Interface support	GigE
Display name	Stat Packet Unavailable
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
4294967295	Maximum value

StatTimeElapsed

Displays the Elapsed time since the streaming was started.

Interface support	GigE
Display name	Stat Time Elapsed
Standard	Custom
Origin of feature	Transport layer
Feature type	Float
Access	R
Unit	Seconds [s]
Affected features	Not applicable
Category	/Stream/Statistics

Values	Description
0	Minimum value
1.79769313486e+308	Maximum value

StreamInformation

The features in this category can be used to display, such as the streaming status, the frame rate, and the transfer status of frames sent by the camera.

Interface support	All (most features)
Display name	Stream Information
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

StreamID

Displays the camera's unique ID for the stream, for instance a GUID.

Interface support	All
Display name	Stream ID
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/StreamInformation

StreamIsGrabbing

Displays the status of the acquisition engine.

Interface support	CSI-2, USB
Display name	Stream Is Grabbing
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Boolean
Access	R
Affected features	`MaxDriverBuffersCount`, `StreamPayloadSizeMode`, `StreamPayloadSizeAlignment`, `ManualStreamPayloadSize`
Category	/StreamInformation

Values	Description
False	Acquisition engine is not started.
True	Acquisition engine is started.

StreamType

Displays the transport layer type of the data stream.

Interface support	All
Display name	Stream Type
Standard	GenTL SFNC adapted
Origin of feature	Transport layer
Feature type	Enumeration
Access	R
Affected features	Not applicable
Category	/StreamInformation

Values	Description
Custom	The transport layer is MIPI CSI-2 type.
GEV	The transport layer is GigE type.
USB3	The transport layer is USB 3.x type.

Statistics (subcategory)

Note: Features in this subcategory are available for Alvium CSI-2 cameras only.

The features in this subcategory can be used to display the frame rate and the transfer status of frames sent by the camera.

Interface support	CSI-2
Display name	Statistics
Standard	Custom
Origin of feature	Transport layer
Feature type	Subcategory
Category	/StreamInformation

StatFrameRate

Displays the rate at which the device is sending frames to the host, derived from the frame timestamps.

Interface support	CSI-2
Display name	Stat Frame Rate
Standard	Custom
Origin of feature	Transport layer
Feature type	Float
Access	R
Unit	fps [frames per second]
Affected features	Not applicable
Category	/StreamInformation/Statistics

Values	Description
0	Minimum value
1.79769313486e+308	Maximum value

StatFrameCRCError

Displays the number of frames received with CRC errors.

Interface support	CSI-2
Display name	Stat Frame CRC Error
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/StreamInformation/Statistics

Values	Description
0	Minimum value
9223372036854775807	Maximum value

StatFrameDelivered

Displays the number of frames received without errors.

Interface support	CSI-2
Display name	Stat Frame Delivered
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/StreamInformation/Statistics

Values	Description
0	Minimum value
9223372036854775807	Maximum value

StatFrameIncomplete

Displays the number of incomplete frames received.

Note: Shoved frames are not included.

Interface support	CSI-2
Display name	Stat Frame Incomplete
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/StreamInformation/Statistics

Values	Description
0	Minimum value
9223372036854775807	Maximum value

StatFrameUnderrun

Displays the number of missed frames caused by a missing user supplied buffer (buffer underrun).

Interface support	CSI-2
Display name	Stat Frame Underrun
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/StreamInformation/Statistics

Values	Description
0	Minimum value
9223372036854775807	Maximum value

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