Allied Vision

mipi GenICam for CSI-2 Access

EMBEDDED VISION SYSTEMS

Alecs

Features Reference

V1.1.0

BSP: V1.0.2

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2026-Mar-25

This document at a glance

Read this document carefully

This reference describes features to control embedded camera systems included in Alecs vision systems. Learn to avoid damage to Alecs and use it safely and efficiently.

Features in this document

This features reference presents modules, categories, and features in alphabetical order, organized as in the **Vimba X Viewer**.

You can easily search for features in this document using the Index on page 187.

Features in Vimba X

Vimba X Viewer's feature tree displays the features categorized by GenTL modules. The module **Camera** contains all camera features, while the modules **Transport Layer**, **Interface**, **Local Device**, and **Stream 0** contain the transport layer features. Order and visibility can be different on third party viewers.

We recommend you to:

- Select the **All** tab to show the feature tree as shown in Figure 1.
- Check **Show Descriptions**.
- Search for features using the search bar.

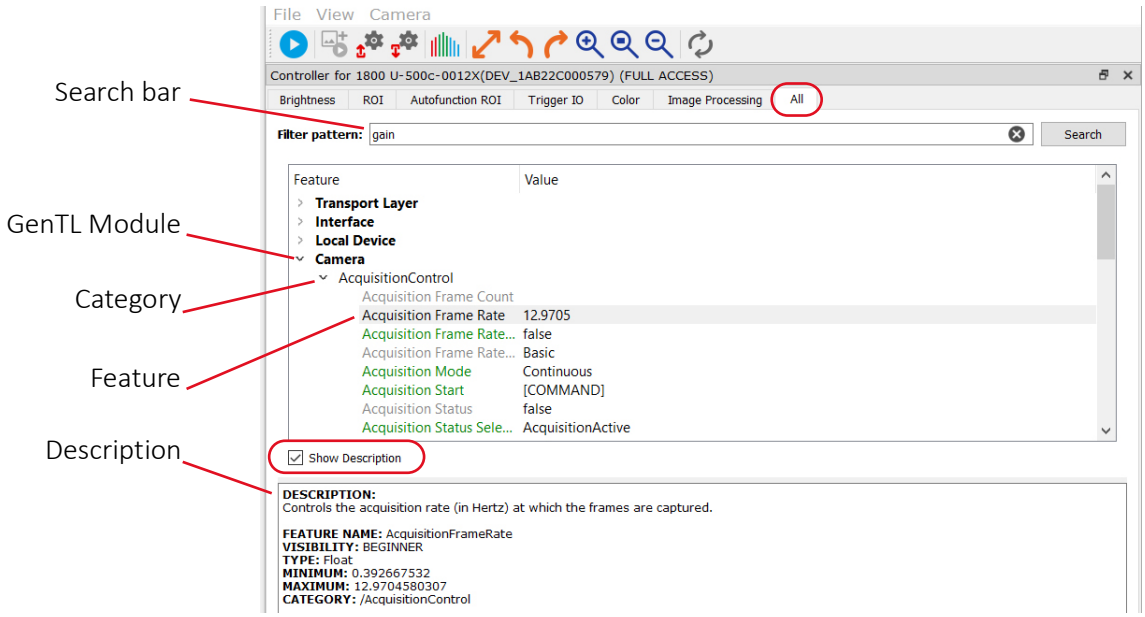

Figure 1: Features listed in the All tab of Vimba X Viewer

Differences in features and values

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

What else do you need?

This is a selection of helpful links:

Download or topic	Link
Alecs embedded camera system documentation and application notes	www.alliedvision.com/en/support/alecs-documentation
Vimba X SDK documentation	www.alliedvision.com/en/products/software/vimba-x-sdk
BSP downloads	Please contact your Allied Vision Sales representative or visit www.alliedvision.com/en/about-us/contact-us/contact-sales.
Technical support	www.alliedvision.com/en/support

Table 1: Helpful links

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Website, email

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

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Document history and conventions

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Document history

Version	Date	Document updates

V1.1.0	2026-Mar-26	**Release: BSP: V1.0.2**
		(Jetpack V6.2, camera FW V00.14.01.29922c93)
		• Incremented the related BSP version from V1.0.1 to V1.0.2:
		  - The update fixes a bug based on Jetson Linux 36.4.3.
		  - The camera firmware version remains the same. Therefore, the feature descriptions in this reference stay unchanged.
		• In this table, corrected the BSP version for document V1.0.0 from BSP V1.0.0 to BSP V1.0.1.
		• Applied editorial changes.

V1.0.0	2025-Oct-10	**Release: BSP: V1.0.1** (Jetpack V6.2, camera FW V00.14.01.29922c93) Release version

Table 2: Document history

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.
`Feature names`	Features names are displayed as monospaced text.
`Feature options`	Features options and values that are selectable by the user are displayed as monospaced italicized text.
`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: Styles used in this reference

Symbols and notes

Practical tip

Additional information helps to understand or ease handling the embedded camera system.

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 controls for Alecs embedded camera systems as seen from **Vimba X Viewer**.

These features comply with the following standards:

- 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) Version 1.1.1
- GenICam Generic Control Protocol (GenCP) Version 1.3

Downloads of applied common standards

For SFNC, GenTL SFNC, and GenCP, see www.genicam.org
For 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 17.

Acronyms and terms

Abbreviation/term	Meaning
Custom	Non-standard features that are adding to new functions to the existing standard feature definitions
Custom **(deprecated)**	Features that derive from an outdated non-standard version
GenTL SFNC	GenICam Transport Layer Standard Features Naming Convention
GenTL SFNC adapted	Features that deviate from the GenTL SFNC definition
SFNC	GenICam Standard Features Naming Convention
SFNC adapted	Features that deviate from the SFNC definition

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 Features in Vimba X 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 *(subcategory)*.

Feature

[Selector]

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

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 embedded camera system. 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**.

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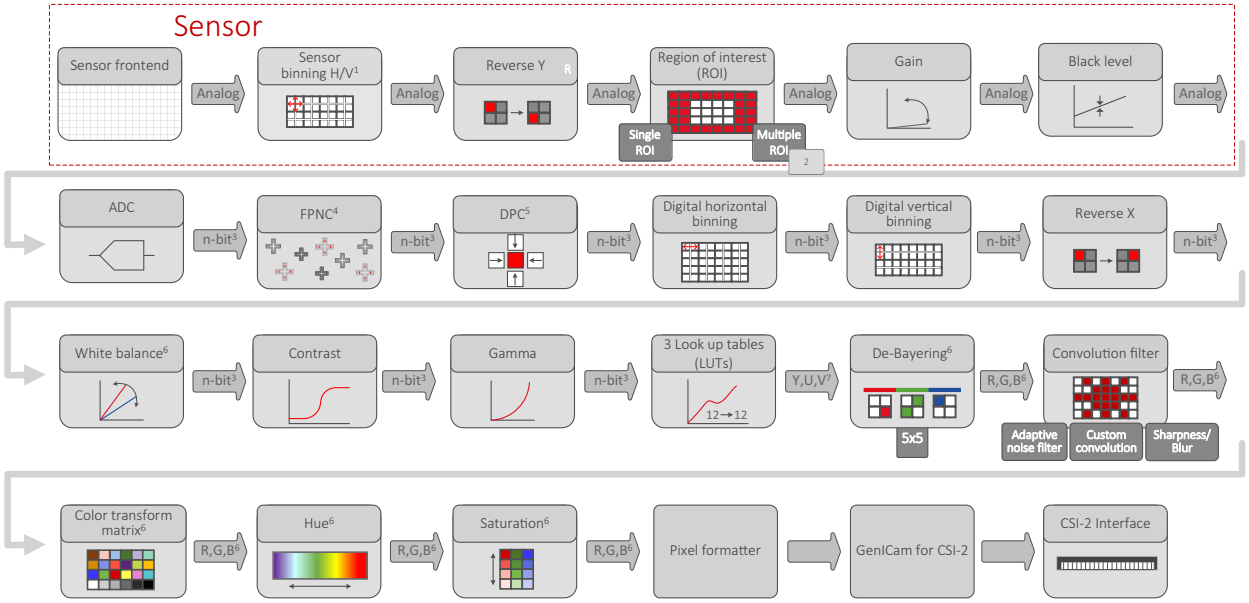
Notes on feature description

This chapter includes:

Image data flow 20
Feature interdependencies 21
Regions of interest and auto mode regions 22

Image data flow

To develop your application effectively, note the order in which the features are **processed** in Alecs. See Feature interdependencies on page 21 for the recommended order to **configure** the embedded camera system. In the Alecs User Guide, the image data flow describes the sequence of image processing steps inside the embedded camera system. The shown functionalities represent features or feature groups.



[1] Selected monochrome models only: See the Alecs User Guide.

[2] Selected models only: See the Alecs User Guide.

[3] Model dependent: See ADC bit depths stated in the Alecs User Guide.

[4] Factory preset for FPNC = Fixed Pattern Noise Correction.
For model availability, see the Alecs User Guide.

[5] Factory preset for DPC = Defect pixel correction

[6] Color models only

[7] For monochrome models: Y only

Figure 2: Image data flow for Alecs Vision systems

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.

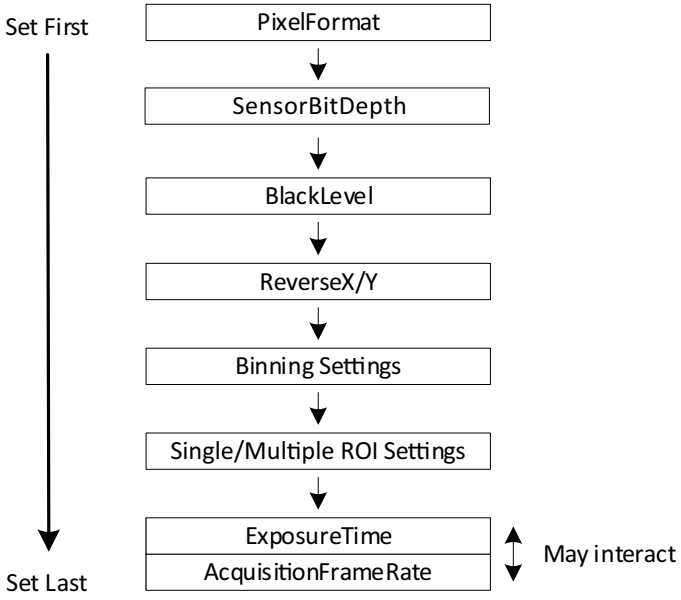


Figure 3: Interdependencies between features

Regions of interest and auto mode regions

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.

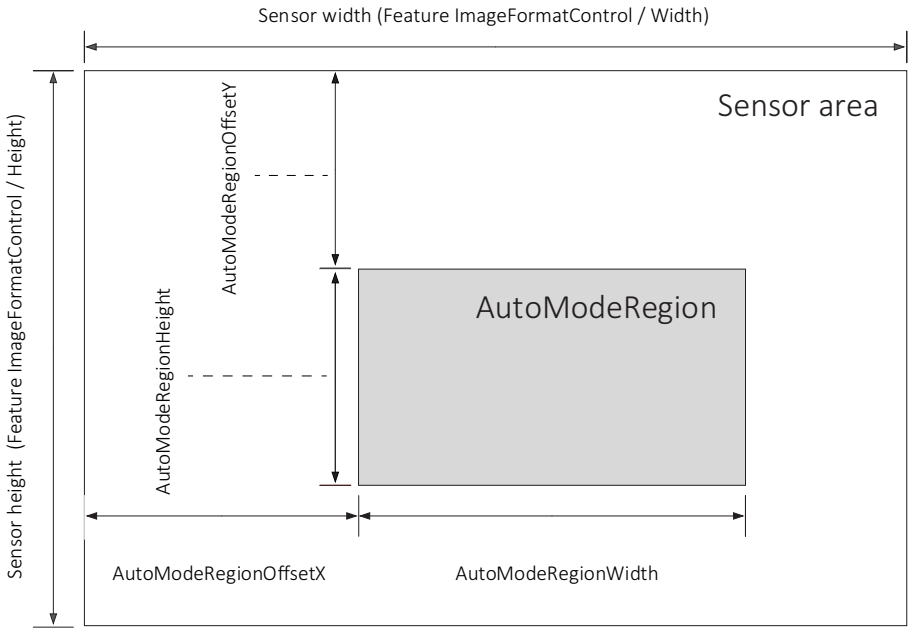


Figure 4: auto mode region and ROI measurement features

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 embedded 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.

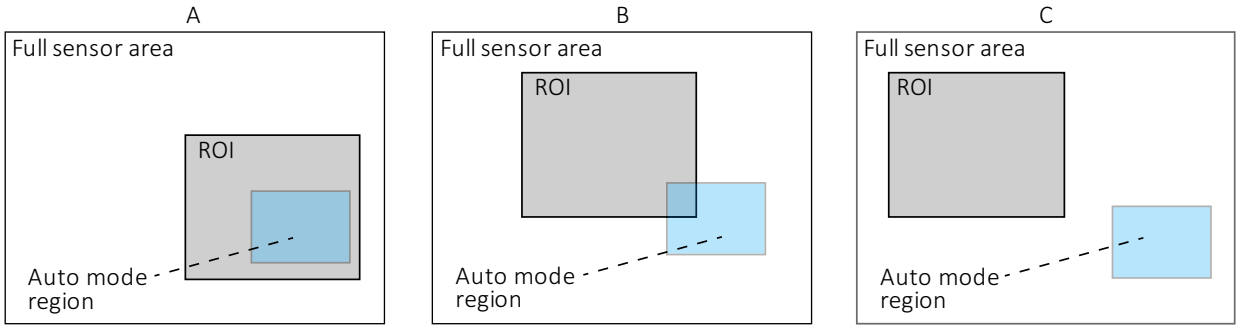


Figure 5: ROI and auto mode region effects

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.

Feature descriptions: Transport Layer

This chapter includes:

DigitalIOControl 25
IndicatorLEDControl 28
InterfaceEnumeration 32
LightControl 34
SystemInformation 36

DigitalIOControl

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

Display name	DigitalIOControl
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

LineMode

[LineSelector]

Displays the signal direction for the selected physical line.

Display name	Line Mode
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R
Affected features	`TriggerSource`, `LineInverter`, `LineSource`
Category	/DigitalIOControl

Values	Description
`Input`	The physical line is used for signal input. **Fix** value for Line2 and Line3.
`Output`	The physical line is used for signal output. **Fix** value for Line4 and Line5.

LineSelector

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

Display name	Line Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	`LineMode`, `LineSource`, `LineInverter`, `LineStatus`, `LineStatusAll`
Category	/DigitalIOControl

Values	Physical line	Description
`Line2`	GPI0	Line 2 (input) is selected for configuration.
`Line3`	GPI1	Line 3 (input) is selected for configuration.
`Line4`	GPO0	Line 4 (output) is selected for configuration.
`Line5`	GPO1	Line 5 (output) is selected for configuration.

LineSource

[LineSelector]

Enables or disables the output signal for the selected line.

Display name	Line Source
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/DigitalIOControl

Values	Description
On	The signal is output (**default**).
Off	No signal is output.

Table 6: LineSource > Possible values

LineStatus

[LineSelector]

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

Display name	Line Status
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Boolean
Access	R
Affected features	Not applicable
Category	/DigitalIOControl

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

IndicatorLEDControl

The features in this category can be used to control the LEDs on the lateral sides of the Alecs housing.

Display name	IndicatorLEDControl
Standard	Custom
Origin of feature	Transport layer
Feature type	(Category)

LEDSelector

Selects the LEDs to be configured on the lateral sides of the Alecs housing.

Display name	LED Selector
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/IndicatorLEDControl

Values	Description
LED0	Selects LED0 to be configured.
LED1	Selects LED1 to be configured.
...	...
LED9	Selects LED9 to be configured.

LEDValueBlue

[LEDValueSelector]

Controls the blue brightness level for the selected LED.

Display name	LED Value Blue
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/IndicatorLEDControl

Values	Description
0	Minimum
255	Maximum

LEDValueGreen

[LEDValueSelector]

Controls the green brightness level for the selected LED.

Display name	LED Value Green
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/IndicatorLEDControl

Values	Description
0	Minimum
255	Maximum

LEDValueRed

[LEDValueSelector]

Controls the red brightness level for the selected LED.

Display name	LED Value Red
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/IndicatorLEDControl

Values	Description
0	Minimum
255	Maximum

LEDValuesLoad

[LEDValueSelector]

Loads the LED configuration from Alecs' SSD to replace the current LED configuration.

Notes:

- When `LEDValuesLoad` is executed, values previously set for `LEDValueBlue`, `LEDValueGreen`, or `LEDValueRed` are overwritten.
- No data is loaded to the SSD, the configuration is not persistent.

Display name	LED Values Load
Standard	Custom
Origin of feature	Transport layer
Feature type	Command
Access	W
Affected features	Not applicable
Category	/IndicatorLEDControl

LEDValuesSave

[LEDValueSelector]

Saves the LED configuration to Alecs' SSD.

Notes:

- When `LEDValuesSave` is executed, values set for `LEDValueBlue`, `LEDValueGreen`, or `LEDValueRed` are applied.
- No data is loaded to the SSD, the configuration is not persistent.

Display name	LED Values Save
Standard	Custom
Origin of feature	Transport layer
Feature type	Command
Access	W
Affected features	Not applicable
Category	/IndicatorLEDControl

InterfaceEnumeration

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

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

InterfaceCount

Displays the number of interfaces on the corresponding GenTL Producer.

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.

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.

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

InterfaceSelector

Selects the GenTL Producer interface.

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.

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

LightControl

The features in this category can be control lighting.

Display name	Light Control
Standard	Custom
Origin of feature	Transport layer
Feature type	(Category)

LightBrightness

Controls the brightness for lighting when `LightControllerSelector` is set to *`ContinuousStrobe`*.

Display name	Light Brightness
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/LightControl

Values	Description
`10`	Minimum
`100`	Maximum

LightControllerMode

Selects the operation mode for lighting.

Display name	Light Controller Mode
Standard	Custom
Origin of feature	Transport layer
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/LightControl

Values	Description
FlashedStrobe	Triggered flash mode is selected.
Off	Lighting is disabled.
ContinuousStrobe	Continuous mode is selected.

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.

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

DeviceFamilyName

Displays the identifier of the product family of the embedded camera system.

Display name	Device Family Name
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

DeviceModelID

Displays the Model ID referred to in the DoC (document of certificate).

Display name	Device Model ID
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

DeviceModelName

Displays the model name of the embedded camera system.

Display name	Device Model Name
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

DeviceSerialNumber

Displays the embedded camera system’s serial number as unique identifier.

Display name	Device Serial Number
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

DeviceTemperature

[DeviceTemperatureSelector]

Displays the embedded camera system's temperature, measured at the location selected by `DeviceTemperatureSelector`.

Display name	Device Temperature
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Float
Access	R
Unit	Degrees Celsius
Affected features	Not applicable
Category	/SystemInformation

DeviceTemperatureSelector

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

Display name	Device Temperature Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	`DeviceTemperature`
Category	/SystemInformation

Value	Description
`Housing`	The housing is measured.
CPU	The CPU temperature is measured.

DeviceVendorName

Displays the name of the embedded camera system's manufacturer.

Display name	Device Vendor Name
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

GenTLSFNCVersionMajor

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

Display name	GenTL SFNC Version Major
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
-9223372036854775808	Minimum
9223372036854775807	Maximum

GenTLSFNCVersionMinor

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

Display name	GenTL SFNC Version Minor
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
-9223372036854775808	Minimum
9223372036854775807	Maximum

GenTLSFNCVersionSubMinor

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

Display name	GenTL SFNC Version Sub Minor
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
-9223372036854775808	Minimum
9223372036854775807	Maximum

GenTLVersionMajor

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

Display name	GenTL Version Major
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
0	Minimum
4294967295	Maximum

GenTLVersionMinor

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

Display name	GenTL Version Minor
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
0	Minimum
4294967295	Maximum

TLDisplayName

Displays the user readable name of the GenTL Producer.

This features corresponds to the TL_INFO_DISPLAYNAME command of the TLGetInfo function.

Display name	TL Display Name
Standard	GenTL 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 the TLGetInfo function.

Display name	TL ID
Standard	GenTL 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 the TLGetInfo function.

Display name	TL Model Name
Standard	GenTL 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 the TLGetInfo function.

Display name	TL Path
Standard	GenTL 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.

This feature corresponds to the TL_INFO_TLTYPE command of the TLGetInfo function.

Display name	TL Type
Standard	GenTL SFNC adapted
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/SystemInformation

Values	Description
Custom	MIPI CSI-2

TLVendorName

Displays the name of the GenTL Producer vendor.

This feature corresponds to the TL_INFO_VENDOR command of the TLGetInfo function.

Display name	TL Vendor Name
Standard	GenTL 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 the TLGetInfo function.

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

Feature descriptions: Interface

This chapter includes:

DeviceEnumeration 46
InterfaceInformation 50

DeviceEnumeration

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

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`.

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
NoAccess	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

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
4294967295	Maximum

DeviceDisplayName

[DeviceSelector]

Displays the user readable name of the selected device.

Display name	Device Display Name
Standard	GenTL SFNC
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.

Display name	Device ID
Standard	GenTL SFNC
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.

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

DeviceSelector

Selects the device to be displayed.

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.

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

Values	Description
Custom	MIPI CSI-2

DeviceUpdateList

Updates the transport layer's device list.

Display name	Device Update List
Standard	GenTL 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.

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

InterfaceInformation

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

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 the IFGetInfo function.

Display name	Interface Display Name
Standard	GenTL 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 the IFGetInfo function.

Display name	Interface ID
Standard	GenTL 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 the IFGetInfo function.

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

Values	Description
Custom	MIPI CSI-2

Feature descriptions: Local Device

This chapter includes:

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DeviceInformation 54
StreamEnumeration 57
TransportLayerControl 59

DeviceControl

The feature `DeviceReset` in this category can be used to restart the camera included in Alecs.

Display name	Device Control
Standard	SFNC
Origin of feature	Transport layer (mainly)
Feature type	(Category)

DeviceReset

Resets the camera to its power up state.

Note: After reset, the camera must be rediscovered.

Display name	Device Reset
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Command
Access	W
Affected features	Not applicable
Category	/DeviceControl

DeviceInformation

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

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 the DevGetInfo function.

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

DeviceID

Displays the interface-wide unique identifier of this device.

This feature corresponds to the DEVICE_INFO_ID command of the DevGetInfo function.

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).

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.

This feature corresponds to the DEVICE_INFO_MODEL command of the DevGetInfo function.

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.

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

DeviceVendorName

Displays the name of the camera vendor.

This feature corresponds to the DEVICE_INFO_VENDOR command of the DevGetInfo function.

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 full path to the system driver including name and extension.

This feature corresponds to the DRIVER_INFO_PATHNAME command of the TLGetInfo function.

Display name	Driver Path
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceInformation

StreamEnumeration

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

Display name	Stream Enumeration
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

StreamCount

Displays the number of available streams.

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
4294967295	Maximum

StreamID

[StreamSelector]

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

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.

Display name	Stream Selector
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/StreamEnumeration

Values	Description
≥0	Value range

TransportLayerControl

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

Display name	TransportLayerControl
Standard	Custom
Origin of feature	Transport layer
Feature type	(Category)

Info (subcategory)

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

Display name	Info
Standard	Custom
Origin of feature	Transport layer
Feature type	Subcategory
Category	/TransportLayerControl

CSI2ClockFrequency

Displays the MIPI CSI-2 clock frequency.

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 driver interface.

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

CSI2DriverVersion

Displays the version of the MIPI CSI-2 driver.

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

CSI2LaneCount

Displays the number of used MIPI CSI-2 lanes.

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.

Display name	libcsi 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.

Display name	Packet Count
Standard	Custom
Origin of feature	Transport layer
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.

Display name	Packet Size
Standard	Custom
Origin of feature	Transport layer
Feature type	Integer
Access	R
Unit	Bytes
Affected features	Not applicable
Category	/TransportLayerControl/Info

Values	Description
0	Minimum
4294967295	Maximum

Feature descriptions: Camera

This chapter includes:

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AnalogControl 76
AutoModeControl 81
ColorTransformationControl 90
CorrectionControl 95
CounterAndTimerControl 99
DeviceControl 113
DigitalIOControl 127
FileAccessControl 132
ImageFormatControl 139
ImageProcessingControl 153
LensShadingControl 163
LUTControl 168
SoftwareSignalControl 172
TestControl 173
TransportLayerControl 174
UserSetControl 175

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.

Display name	Acquisition Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	(Category)

AcquisitionFrameCount

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

Display name	Acquisition Frame Count
Standard	SFNC
Origin of feature	Alecs embedded camera system
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 21. In this case the value for `AcquisitionFrameRate` must be re-adjusted by the user.

Display name	Acquisition Frame Rate
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`.

Display name	Acquisition Frame Rate Enable
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`.

Display name	Acquisition Frame Rate Mode
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Acquisition Mode
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`.

Display name	Acquisition Start
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	Not applicable
Category	/AcquisitionControl

AcquisitionStatus

[AcquisitionStatusSelector]

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

Display name	Acquisition Status
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`***.

Display name	Acquisition Status Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Acquisition Stop
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`*.

Display name	Exposure Active Mode
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Exposure Auto
Standard	SFNC
Origin of feature	Alecs embedded camera system
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 the Alecs User Guide.
- For *TriggerWidth* and *TriggerControlled*, the resulting exposure time is extended, because of an exposure offset after the trigger pulse.

Display name	Exposure Mode
Standard	SFNC
Origin of feature	Alecs embedded camera system
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 71.

[2] Global shutter sensor cameras only.

ExposureMode - Using TriggerWidth

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

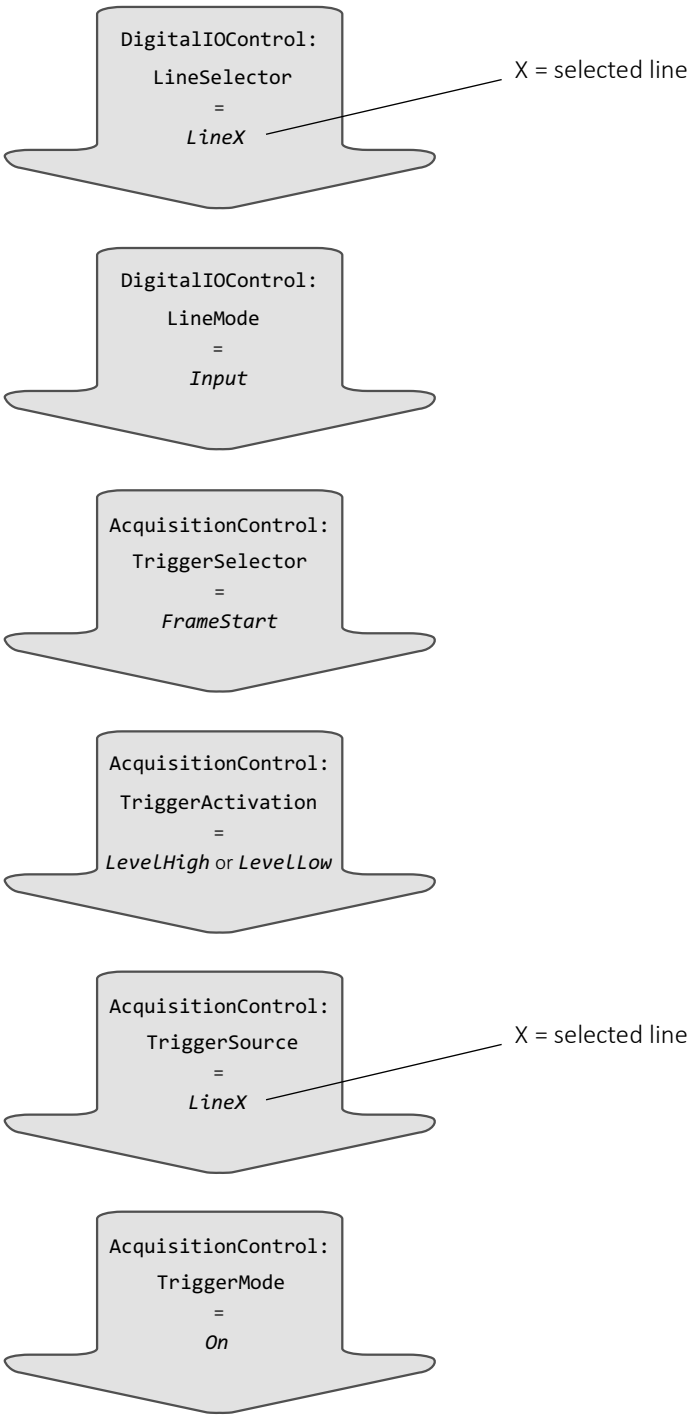

Figure 6: Workflow for using TriggerWidth

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.

Display name	Exposure Time
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Trigger Activation
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Trigger Delay
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Trigger Mode
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Trigger Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	`TriggerMode`, `LineMode`, `TriggerSoftware`, `LineInverter`, `LineSource`, `TriggerSource`, `TriggerActivation`
Category	/AcquisitionControl

Values	Description
`AcquisitionActive`	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 selected trigger terminates the acquisition process.
`AcquisitionStart`	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`*.

Display name	Trigger Software
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`*.

Display name	Trigger Source
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/AcquisitionControl

Values	Description
`Counter0Active`	Counter0Active 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.
`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.

AnalogControl

The features in this category can be used to control the intensity levels for monochrome and color imaging.

Display name	Analog Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Balance Ratio
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Balance Ratio Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Balance White Auto
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Black Level
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Black Level Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Gain
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Gain Auto
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Gain Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Gamma
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Auto Mode Control
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	(Category)

AutoModeRegionHeight

[AutoModeRegionSelector]

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

Display name	Auto Mode Region Height
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Auto Mode Region OffsetX
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Auto Mode Region OffsetY
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	`AutoModeRegionHeight`
Category	/AutoModeControl

AutoModeRegionSelector

Selects the auto mode region to configure.

Display name	Auto Mode Region Selector
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Auto Mode Region Width
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	`AutoModeRegionOffsetX`
Category	/AutoModeControl

BalanceWhiteAutoRate

Controls the frequency of white balance adjustments.

Display name	Balance White Auto Rate
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Balance White Auto Tolerance
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Exposure Auto Max
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Exposure Auto Min
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Gain Auto Max
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Gain Auto Min
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Float
Access	R/W
Affected features	`GainAutoMax`
Category	/AutoModeControl

IntensityAutoPrecedence

Selects the precedence of intensity controller.

Display name	Intensity Auto Precedence
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Intensity Controller Algorithm
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

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.

Display name	Intensity Controller Rate
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Intensity Controller Region
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Intensity Controller Selector
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	`IntensityControllerTolerance`, `IntensityControllerAlgorithm`
Category	/AutoModeControl

Value	Description
`IntensityController1`	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.

Display name	Intensity Controller Target
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Intensity Controller Tolerance
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Color Transformation Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Color Transformation Enable
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Color Transformation Value
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Color Transformation Value Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	`ColorTransformationValue`
Category	/ColorTransformationControl

For values described in the following table, see ColorTransformationControl on page 90 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 [°].

Display name	Hue
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Saturation
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Correction Control
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	(Category)

CorrectionMode

Enables or disables correction features.

Display name	Correction Mode
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Correction Selector
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	`CorrectionMode`, `CorrectionSet`, `CorrectionSetDefault`, `CorrectionDataSize`, `CorrectionEntryType`
Category	/CorrectionControl

Values	Description
`DefectPixelCorrection`[1]	Defect pixel correction (DPC) is selected.
`FixedPatternNoiseCorrection`[1]	Fixed pattern noise correction (FPNC) is selected.

[1] Availability is camera model dependent.

CorrectionSet

[CorrectionSelector]

Selects the currently enabled correction settings.

Display name	Correction Set
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Correction Set Default
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Correction Info
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Subcategory
Category	/CorrectionControl

CorrectionDataSize

[CorrectionSelector]

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

Display name	Correction Data Size
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/CorrectionControl/CorrectionInfo

CorrectionEntryType

Displays the entry type (correction type specific variant).

Display name	Correction Entry Type
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Counter And Timer Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`.

Display name	Counter Duration
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`.

Display name	Counter Event Activation
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

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 that will be the source to increment the counter.

Display name	Counter Event Activation
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Values	Description
AcquisitionActive	The corresponding signal is used as event source.
Counter0Active	
...	
Counter3Active	
ExposureActive	
Line0	
Line1	
Off	The feature is disabled (**default**).
SoftwareSignal0	The corresponding signal is used as event source.
SoftwareSignal1	
Timer0Active	
Timer1Active	

CounterReset

[CounterSelector]

Resets and restarts the selected counter.

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

Display name	Counter Reset
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Counter Reset Activation
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

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.

Display name	Counter Reset Source
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.
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.

Display name	Counter Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Counter Status
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Counter Trigger Activation
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Counter Trigger Source
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.
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.

Display name	Counter Value
Standard	SFNC (adapted)
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
0	Minimum
4294967295	Maximum

CounterValueAtReset

[CounterSelector]

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

Display name	Counter Value At Reset
Standard	SFNC (adapted)
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
0	Minimum
4294967295	Maximum

TimerDelay

[TimerSelector]

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

Display name	Timer Delay
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`.

Display name	Timer Duration
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Timer Reset
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	`TimerDelay`, `TimerDuration`, `TimerStatus`, `TimerSelector`, `TimerTriggerActivation`, `TimerTriggerSource`
Category	/CounterAndTimerControl

TimerSelector

Selects the timer to be configured.

Display name	Timer Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Timer Status
Standard	SFNC (adapted)
Origin of feature	Alecs embedded camera system
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.

Display name	Timer Trigger Activation
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Timer Trigger Source
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/CounterAndTimerControl

Value	Description
AcquisitionActive	The timer is triggered when the acquisition starts.
Counter0Active	The timer is triggered when Counter0 is active
...	...
Counter3Active	The timer is triggered when Counter3 is active
ExposureActive[1]	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.
Off	The timer is disabled or stopped (default).
SoftwareSignal0	The timer is triggered by SoftwareSignal0.
SoftwareSignal1	The timer is triggered by SoftwareSignal1.
SynchronousClock	The timer is triggered by SynchronousClock.
Timer0Active	The timer is triggered when Timer0 is active
Timer1Active	The timer is triggered when Timer1 is active

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

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.

Display name	Device Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	(Category)

DeviceFamilyName

Displays the identifier of the product family of the camera.

Display name	Device Family Name
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceFirmwareID

[DeviceFirmwareIDSelector]

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

Display name	Device Firmware ID
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceFirmwareIDSelector

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

Display name	Device Firmware ID Selector
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Device Firmware Version
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl/DeviceControl

DeviceFirmwareVersionSelector

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

Display name	Device Firmware Version Selector
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Device GenCP Version Major
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Affected features	`DeviceGenCPVersionMinor`
Category	/DeviceControl

DeviceGenCPVersionMinor

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

Display name	Device GenCP Version Minor
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Device Indicator Luminance
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Device Indicator Mode
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Device Link Command Timeout
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Device Link Speed
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Unit	Bytes per second
Affected features	Not applicable
Category	/DeviceControl

DeviceManufacturerInfo

Displays the manufacturer information about the camera.

Display name	Device Manufacturer Info
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceModelName

Displays the model name of the camera.

Display name	Device Model Name
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceReset

Resets the camera to its power up state.

Note: After reset, the camera must be rediscovered.

Display name	Device Reset
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	Not applicable
Category	/DeviceControl

DeviceScanType

Displays the scan type of the image sensor.

Display name	Device Scan Type
Standard	SFNC
Origin of feature	Alecs embedded camera system
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 as unique identifier.

Display name	Device Serial Number
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceSFNCVersionMajor

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

Display name	Device SFNC Version Major
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Device SFNC Version Minor
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Device SFNC Version Sub Minor
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceTemperature

[DeviceTemperatureSelector]

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

Display name	Device Temperature
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Device Temperature Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	`DeviceTemperature`
Category	/DeviceControl

Value	Description
`Mainboard`	The mainboard temperature is measured.
`Sensor`[1]	The sensor temperature is measured.

[1] Selected Alecs models. This value can be output only when the camera is not streaming.

DeviceTemperatureStatus

Displays if the camera is operated at a safe temperature.

Notes

- If the camera is often overheated, the accuracy of the sensor readout can be compromised on the long run. You can use this feature to enable a long life for your camera.
- If the mainboard temperature reaches 90 °C, the camera is shut off.

Display name	Device Temperature Status
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R
Affected features	`DeviceTemperature`
Category	/DeviceControl

Value	Description
`OK`	Mainboard temperature: ≤75 °C User actions: No actions are required.
`Warning`	Mainboard temperature: >75 °C. User actions: We recommend you to take actions to cool down the camera. If the temperature increases even more, the camera will be shut down completely.
`Overtemperature`	The mainboard temperature exceeds the maximum value allowed in the model specifications. The sensor is shut down and the camera does not output images, but you can read out and write settings that do not require the sensor. User actions: We recommend you to ensure adequate cooling for the camera before you restart it.

DeviceTLVersionMajor

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

Display name	Device Transport Layer Version Major
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Device Transport Layer Version Minor
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Device User ID
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R/W
Affected features	Not applicable
Category	/DeviceControl

DeviceVendorName

Displays the name of the camera manufacturer.

Display name	Device Vendor Name
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

DeviceVersion

Displays the camera's product code.

Display name	Device Version
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	String
Access	R
Affected features	Not applicable
Category	/DeviceControl

TimestampLatch

Latches the current timestamp counter into `TimestampLatchValue`.

Display name	Time Stamp Latch
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	`TimestampLatchValue`
Category	/DeviceControl

TimestampLatchValue

Displays the latched value of the timestamp counter.

Display name	Timestamp Latch Value
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Unit	Ticks = Nanoseconds (ns)
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.

Display name	Timestamp Reset
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Digital IO Control Info
Standard	SFNC adapted
Origin of feature	Alecs embedded camera system
Feature type	(Category)

LineDebounceDuration

Controls the time constant for `LineDebounceMode`.

Display name	Line Debounce Duration
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Line Debounce Mode
Standard	Custom
Origin of feature	Alecs embedded camera system
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 output line (Line1).

Display name	Line Inverter
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Boolean
Access	R/W
Affected features	Not applicable
Category	/DigitalIOControl

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

LineMode

[LineSelector]

Displays the signal direction for the selected physical line.

Display name	Line Mode
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R
Affected features	`TriggerSource`, `LineInverter`, `LineSource`
Category	/DigitalIOControl

Values	Description
`Input`	The physical line is used for signal input. **Default** value for Line0.
`Output`	The physical line is used for signal output. **Default** value for Line1.

LineSelector

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

Display name	Line Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

LineSource

[LineSelector]

Sets the output signal for the selected line.

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

Display name	Line Source
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	Not applicable
Category	/DigitalIOControl

Values	Description
`AcquisitionActive`	The *`AcquisitionActive`* signal is output.
`Counter0Active`	The *`Counter0Active`* signal is output.
`...`	...
`Counter3Active`	The *`Counter3Active`* signal is output.
`ExposureActive`[1]	The *`ExposureActive`* signal is output.
`FrameActive`	The *`FrameActive`* signal is output.
`FrameTriggerWait`	The *`FrameTriggerWait`* signal is output. In triggered mode, the signal for *`FrameTriggerWait`* is high when the camera is waiting for a trigger. Vica versa, in fixed frame rate or freerun mode, the signal for *`FrameTriggerWait`* is low.
`Line0Signal`	The *`Line0Signal`* signal is output.
`Line1Signal`	The *`Line1Signal`* signal is output.
`Off`	No signal is output.
`ReadoutActive`	The *`ReadoutActive`* signal is output.
`Stream0TransferActive`	The *`Stream0TransferActive`* signal is output.
`Timer0Active`	The *`Timer0Active`* signal is output.
`Timer1Active`	The *`Timer1Active`* signal is output.

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

Table 7: LineSource > Possible values

LineStatus

[LineSelector]

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

Display name	Line Status
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Line Status All
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/DigitalIOControl

Values	Description
0	Minimum
15	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).

Display name	File Access Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	(Category)

FileAccessBuffer

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

Display name	File Access Buffer
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`.

Display name	File Access Length
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`.

Display name	File Access Offset
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	File Open Mode
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	File Operation Execute
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	File Operation Result
Standard	SFNC
Origin of feature	Alecs embedded camera system
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!

Display name	File Operation Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	File Operation Status
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	File Process Status
Standard	Custom
Origin of feature	Alecs embedded camera system
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!

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

Values	Description
DefectPixelCorrectionPreset	The preset for defect pixel correction (DPC) is target for file operations.
DefectPixelCorrectionUser	User defined defect pixel correction (DPC) is target for file operations.
Firmware	Firmware is target for file operations.
FixedPatternNoiseCorrectionPreset	The preset for fixed pattern noise correction (FPNC) is target for file operations.
FixedPatternNoiseCorrectionUser	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.

Display name	File Size
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/FileAccessControl

FileStatus

[FileSelector]

Displays the status of the selected file.

Display name	File Status
Standard	Custom
Origin of feature	Alecs embedded camera system
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 monochrome 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.`

Display name	Image Format Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	(Category)

Observe with binning features

Only digital binning or sensor binning can be used at a a time.

You must revert binning values to 1 before you can switch between these binning modes.

BinningHorizontal

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

Notes:

- For Alecs models ≥12 MP resolution, if `BinningVertical` is used, `BinningHorizontal` is set to 2.
- With sensor binning, maximum values depend on the camera model.

Display name	Binning Horizontal
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	`WidthMax`
Category	/ImageFormatControl

Values	Description
1	Minimum
8	Maximum (with digital binning)

BinningHorizontalMode

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

Notes:

- Changing `BinningHorizontalMode` sets `BinningVerticalMode` to the same value.
- **Digital binning**: All Alecs models support *`Sum`* and *`Average`*.
- **Sensor binning**: Alecs models with sensor binning support *`Sum`* or *`Average`*, or both.

Display name	Binning Horizontal Mode
Standard	SFNC
Origin of feature	Alecs embedded camera system
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`.

Note: Only digital binning or sensor binning can be used at a a time.

Display name	Binning Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

BinningVertical

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

Note: With sensor binning, maximum values depend on the camera model.

Display name	Binning Vertical
Standard	SFNC
Origin of feature	Alecs embedded camera system
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 (with digital binning)

BinningVerticalMode

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

Note:

- Changing `BinningVerticalMode` sets `BinningHorizontalMode` to the same value.
- **Digital binning**: All Alecs models support *`Sum`*, and *`Average`*.
- **Sensor binning**: All Alecs models with sensor binning support *`Sum`*, some models support *`Average`* in addition.

Display name	Binning Vertical Mode
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Height
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Height Max
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Unit	Pixel
Affected features	`Height`, `OffsetY`
Category	/ImageFormatControl

OffsetX

Controls the horizontal offset from the origin to the ROI.

Display name	Offset X
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	`AutoModeRegionOffsetX`, `AutoModeRegionWidth`
Category	/ImageFormatControl

Values	Description
0	Minimum
16	Increment

OffsetY

Controls the vertical offset from the origin to the ROI.

Display name	Offset Y
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Unit	Pixel
Affected features	`AutoModeRegionOffsetY`, `AutoModeRegionHeight`
Category	/ImageFormatControl

Values	Description
0	Minimum
8	Increment

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.

Display name	Pixel Format
Standard	SFNC
Origin of feature	Alecs embedded camera system
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).

Display name	Pixel Size
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.
See Feature interdependencies on page 21.

Display name	Reverse X
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.
See Feature interdependencies on page 21.

Display name	Reverse Y
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Sensor Bit Depth
Standard	Custom
Origin of feature	Alecs embedded camera system
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]Sensor model dependent

SensorHeight

Displays the effective sensor height.

Display name	Sensor Height
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Unit	Pixel
Affected features	`HeightMax`
Category	/ImageFormatControl

SensorWidth

Displays the effective sensor width.

Display name	Sensor Width
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Unit	Pixel
Affected features	`WidthMax`
Category	/ImageFormatControl

SensorShutterMode

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

Display name	Shutter Mode
Standard	SFNC adapted
Origin of feature	Alecs embedded camera system
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).

Width

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

Display name	Width
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Width Max
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Image Processing Control
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	(Category)

AdaptiveNoiseSupressionFactor

Controls the amount of the noise suppression.

Display name	Adaptive Noise Supression Factor
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Float
Access	R/W
Affected features	Not applicable
Category	/ImageProcessingControl

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

ColorInterpolation

Selects the `ColorInterpolation` filter.

Note: This feature is available only with color models.

Display name	Color Interpolation
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Contrast Control
Standard	Custom
Origin of feature	Alecs embedded camera system
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**.

Display name	Contrast Bright Limit
Standard	Custom
Origin of feature	Alecs embedded camera system
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 155.

Display name	Contrast Dark Limit
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Contrast Enable
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

Display name	Contrast Shape
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ImageProcessingControl/ContrastControl

Values	Description
1	Minimum
4	Default value
10	Maximum
1	Increment

Figure 7 and Figure 8 on page 158 show the transfer curves for different values.

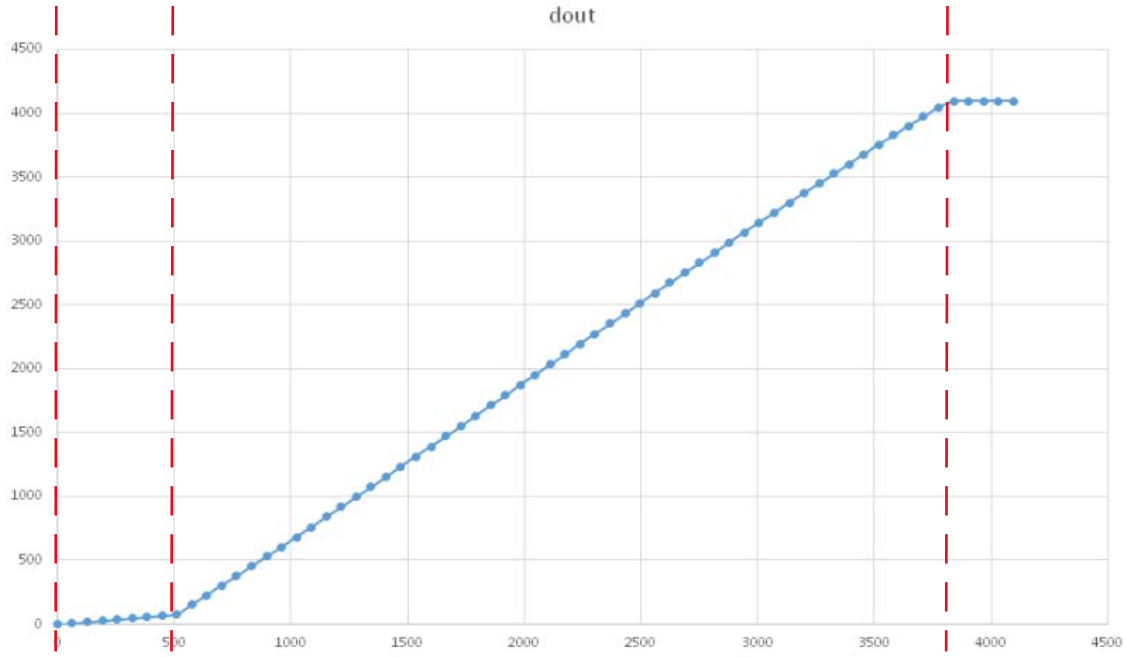

Figure 7: Image transfer for a value of 1

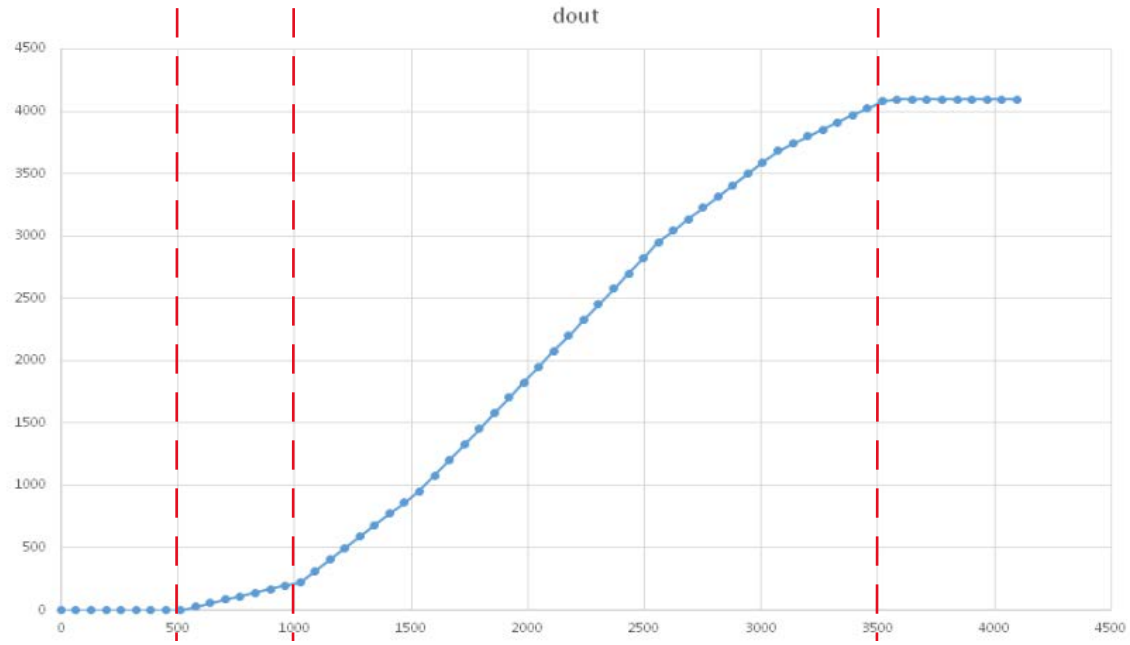

Figure 8: Image transfer for a value of 9

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.

Display name	Convolution Mode
Standard	Custom
Origin of feature	Alecs embedded camera system
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`.

Display name	Custom Convolution Value
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/ImageProcessingControl

Values	Description
0	Minimum
255	Maximum

CustomConvolutionValueSelector

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

Display name	Custom Convolution Value Selector
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	`AdaptiveNoiseSuppressionFactor`, `CustomConvolutionValue`, `Sharpness`
Category	/ImageProcessingControl

Values	Description
`Coefficient00...04`	Selects coefficients from 00 to 04.
`Coefficient10...14`	Selects coefficients from 10 to 14.
`Coefficient20...24`	Selects coefficients from 20 to 24.
`Coefficient30...34`	Selects coefficients from 30 to 34.
`Coefficient40...44`	Selects coefficients from 40 to 44.

	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 9: Matrix for coefficient values

Sharpness

Selects the degree of sharpness or blurring of the image.

Display name	Sharpness
Standard	Custom
Origin of feature	Alecs embedded camera system
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.

LensShadingControl

Some lenses do not illuminate the image uniformly across the image plane. Brightness decreases towards the corners in circles. This effect is called lens shading. The features in this category can be used to compensate for this effect.

Display name	Lens Shading Control
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	(Category)

Functional overview

Figure 10 shows schematically how the lens shading correction works.

`LensShadingCenterOffsetX` and `LensShadingCenterOffsetY` define the center position of the lens shading effect.

`LensShadingValue` defines the factor to brighten up the image. This is done in concentric circles counted from the origin $C_{Lens\ Shading}$.

`LensShadingIndex` counts the circle where you want to apply the next step to brighten up the image, counted as offset from the origin $C_{Lens\ Shading}$ in pixels.

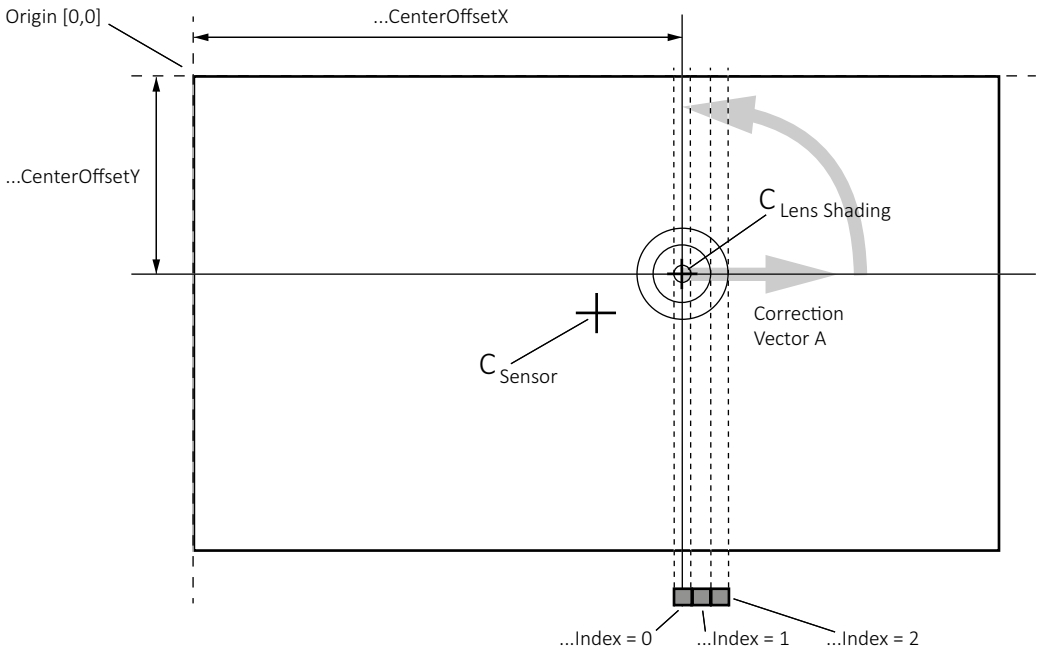

Figure 10: Lens shading correction overview

Lens shading features affect the brightness values for each pixel as shown in this equation:

$$out(x,y) = in(x,y) * A\left(\left\lfloor\sqrt{(o_x - x)^2 + (o_y - y)^2}\right\rfloor\right)$$

Equation 1: Calculating input and output values for image brightness by pixel

With the following variables:

Variable	Related feature or description
o_x	`LensShadingCenterOffsetX`
o_y	`LensShadingCenterOffsetY`
A()	`LensShadingIndex`, `LensShadingValue`
x	X coordinate of input pixel
y	Y coordinate of input pixel

Table 8: Variable in the equation above

LensShadingCenterOffsetX

Controls the horizontal distance of $C_{Lens\ Shading}$ to the origin. See Figure 10 on page 163.

Display name	Lens Shading Center OffsetX
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Unit	Pixels
Affected features	Not applicable
Category	/LensShadingControl

Values	Description
Sensor model dependent	Minimum
Sensor model dependent	Maximum

LensShadingCenterOffsetY

Controls the vertical distance of $C_{Lens\ Shading}$ to the origin. See Figure 10 on page 163.

Display name	Lens Shading Center OffsetY
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Unit	Pixels
Affected features	Not applicable
Category	/LensShadingControl

Values	Description
Sensor model dependent	Minimum
Sensor model dependent	Maximum

LensShadingEnable

Enables or disables the lens shading correction.

Display name	Lens Shading Enable
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Boolean
Access	R/W
Affected features	Not applicable
Category	/LensShadingControl

Values	Description
False	The lens shading correction is disabled (default).
True	The lens shading correction is enabled.

LensShadingIndex

Selects the circle where the lens shading correction multiplies brightness values by `LenShadingValue`, This value is maintained until the next circle defined by `LensShadingIndex`.

Note: This features counts from the origin $C_{Lens\ Shading}$ in pixels as shown in Figure 10 on page 163.

Display name	Lens Shading Index
Standard	Custom
Origin of feature	Camera
Feature type	Integer
Access	R/W
Affected features	Not applicable
Category	/LensShadingControl

Values	Description
0	Minimum
Sensor model dependent	Maximum

LensShadingLoadAll

Loads configuration datasets for the lens shading correction from the non-volatile memory of the camera.

Display name	Lens Shading Load All
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	Not applicable
Category	/LensShadingControl

LensShadingSaveAll

Saves configuration datasets for the lens shading correction to the non-volatile memory of the camera.

Display name	Lens Shading Save All
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	Not applicable
Category	/LensShadingControl

LensShadingValue

Controls the factor to multiply the image brightness starting from the selected circle defined by `LensShadingIndex`. See Figure 10 on page 163.

Display name	Lens Shading Value
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Float
Access	R/W
Affected features	Not applicable
Category	/LensShadingControl

Values	Description
0	Minimum
1	The current brightness is maintained (default).
8	Maximum

LUTControl

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

Display name	LUT Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	(Category)

LUTEnable

[LUTSelector]

Enables or disables the selected LUT.

Display name	LUT Enable
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	LUT Index
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Affected features	`LUTValue`
Category	/LUTControl

Values	Description
0	Minimum
4095	Maximum

LUTLoadAll

Loads the LUT configuration from the non-volatile memory of the camera to replace the current LUT configuration.

Display name	LUT Load All
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	`LUTIndex`, `LUTValue`, `LUTValueAll`
Category	/LUTControl

LUTSaveAll

Saves the current LUT configuration to the non-volatile memory of the camera.

Display name	LUTSave All
Standard	Custom
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	`LUTIndex`, `LUTValue`, `LUTValueAll`
Category	/LUTControl

LUTSelector

Selects the LUT to be controlled.

Display name	LUT Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	LUT Value
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	LUT Value All
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Raw
Access	R/W
Affected features	Not affected
Category	/LUTControl

SoftwareSignalControl

The features in this category can be used by external devices to trigger actions within the camera by software commands.

See AnalogControl on page 76 for the interaction with features in this category.

Display name	Software Signal Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	(Category)

SoftwareSignalPulse

[SoftwareSignalSelector]

Generates a pulse signal used by external devices to trigger actions within the camera by software commands.

Display name	Software Signal Pulse
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	Not applicable
Category	/SoftwareSignalControl

SoftwareSignalSelector

Selects which Software Signal features to control.

Display name	Software Signal Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Test Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	Test Pending Ack
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R/W
Unit	ms
Affected features	Not applicable
Category	/TestControl

Values	Description
0	Minimum
60000	Maximum

TransportLayerControl

The features in this category can be used to control the camera's payload size.

Display name	Transport Layer Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	(Category)

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.

Display name	Payload Size
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Integer
Access	R
Unit	Bytes
Affected features	Not applicable
Category	/TransportLayerControl

Values	Description
0	Minimum

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 Alecs vision systems support all features except for:

- Selectors
- Command features
- Read-only features
- Features in the `LUTControl` category.

Display name	User Set Control
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	(Category)

UserSetDefault

Selects the user set to be loaded by default when the camera is reset.

Display name	User Set Default
Standard	SFNC
Origin of feature	Alecs embedded camera system
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.

Display name	User Set Load
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	All features that are not excluded from user sets. See the Alecs 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`.

Display name	User Set Save
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Command
Access	W
Affected features	All features that are not excluded from user sets. See the Alecs User Guide for exceptions.
Category	/UserSetControl

UserSetSelector

Selects the user set to be loaded or saved.

Display name	User Set Selector
Standard	SFNC
Origin of feature	Alecs embedded camera system
Feature type	Enumeration
Access	R/W
Affected features	`UserSetLoad`, `UserSetSave` All features that are not excluded from user sets. See the Alecs 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.

Feature descriptions: Stream 0

This chapter includes:

BufferHandlingControl 179
StreamInformation 182

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 Alecs embedded camera systems use Stream0 only.

The features in this category can be used to control the buffers in the acquisition engine of the data stream.

Display name	Buffer Handling Control
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	(Category)

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.

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.

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

StreamBufferAlignment

Displays the required alignment of the payload buffer passed to `DSAnnounceBuffer` for streaming..

Display name	Stream Buffer Alignment
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Unit	Bytes
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.

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.

StreamBufferMode

Displays the currently used buffer mode from the lower software layer.

Note: Available values depend on the CSI transport layer version..

Display name	Stream Buffer Mode
Standard	Custom
Origin of feature	Transport layer
Feature type	String
Access	R
Affected features	`StreamAcquisitionModeSelector`
Category	/BufferHandlingControl

Value	Frames are captured:
`MMAP`	By zero copy transfer using driver allocated memory (fast).
`MMAP COPY`	Using kernel allocated memory and are copied to the announced buffer (slow).
`Unknown`	Unclear status. This is displayed when the camera is not streaming.
`USERPTR`	By zero copy transfer using user space allocated memory (fast).
`USERPTR COPY`	Using user space allocated memory and are copied to the announced buffer (slow).

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.

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

Statistics (subcategory)

The features in this subcategory can be used to display the frame rate and the transfer status of frames sent by the camera.

Display name	Statistics
Standard	Custom
Origin of feature	Transport layer
Feature type	Subcategory
Category	/StreamInformation

StatFrameCRCError

Displays the number of frames received with CRC errors.

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
9223372036854775807	Maximum

StatFrameDelivered

Displays the number of frames received without errors.

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
9223372036854775807	Maximum

StatFrameIncomplete

Displays the number of incomplete frames received.

Note: Shoved frames are not included.

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
9223372036854775807	Maximum

StatFrameRate

Displays the rate at which the device is sending frames to the host, derived from the frame timestamps.

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
1.79769313486e+308	Maximum

StatFrameUnderrun

Displays the number of frames missed due to the non-availability of a user supplied buffer (buffer underrun).

Display name	Stat Frame Underrun
Standard	Custom (deprecated)
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	Not applicable
Category	/StreamInformation/Statistics

Values	Description
0	Minimum
9223372036854775807	Maximum

StreamInformation (category continued)

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

StreamID

Displays the camera's unique identifier for the stream, for instance a GUID.

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.

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.

StreamLayout

Displays the used stream layout.

Display name	Stream Layout
Standard	GenTL SFNC
Origin of feature	Transport layer
Feature type	Integer
Access	R
Affected features	`MaxDriverBuffersCount`, `StreamPayloadSizeMode`, `StreamPayloadSizeAlignment`, `ManualStreamPayloadSize`
Category	/StreamInformation

Values	Description
0	Minimum
4294967295	Maximum

StreamType

Displays the transport layer type of the data stream.

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.

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