

allPIXA evo camera | Features Reference



VERSION 3.14.0

Firmware version 5.1.0
GenICam XML 3.51.0

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1 Introduction

The **Features Reference Guide** describes the features for Chromasens allPIXA evo cameras using the GenICam SFNC (Standard Feature Naming Convention).

In addition, the error codes of the camera are documented here.

1.1 Connection Timeouts

Reading and writing different features leads to different execution times on the camera and therefore to shorter or longer response times. To establish communication without getting timeouts the timeout parameters must be configured in a way to be within the execution time of all feature read/write requests.

| Parameter | Value |
|---|--------|
| Control Channel timeout (<i>CC_timeout</i>) | 3000ms |
| Control Channel retry count | 3 |
| Device Link Heartbeat Timeout | 9000ms |

Special note for sphinx lib users. In *SphinxLib HeartbeatRate* corresponds to [Device Link Heartbeat Timeout](#). The *cc_heartbeat_timeout* of sphinx lib should be set to a third of [Device Link Heartbeat Timeout](#).

2 Feature Availability

The following table illustrates the availability of features for several camera variants.

| Feature | ax_dxge | ax_dsxge | ax_cxp | g8_dxge | g8_cxp |
|------------------------------|---------|----------|--------|---------|--------|
| Trigger Control | A | A | A | A | A |
| Encoder Control | A | A | A | A | A |
| Scan Direction Source | NA | NA | A | A | A |
| Master/Slave Mode | A | A | E | A | E |
| Led Flash Control | A | E | E | E | E |
| Single ROI support | A | A | A | A | A |
| Multi ROI support | NA | A | NA | NA | NA |
| Reverse X | A | A | A | A | A |
| Binning Horizontal | A | A | A | A | A |
| Decimation Horizontal | NA | NA | NA | A | A |
| Gain Auto | A | A | A | A | A |
| Sensor Sensitivity | A | A | A | A | A |
| Internal DSNU/PRNU capturing | NA | NA | E | E | E |
| Color Transformation Control | A | A | A | A | A |
| Gamma | A | A | NA | A | A |
| Brightness Contrast | A | A | A | A | A |
| User Set Control | A | A | A | A | A |
| File Access Control | A | A | A | A | A |
| Four Color Mode (RGB+NIR) | NA | NA | NA | A | A |

A: Available

NA: Not Available

E: Experimental

3 Variants

The following table shows the different camera variants available:

| Variant | Types |
|----------|---|
| ALL | ax_dxge, ax_dsxge, ax_cxp, g8_dxge and g8_cxp |
| ax_X | ax_dxge, ax_dsxge and ax_cxp |
| g8_X | g8_dxge and g8_cxp |
| X_dxge | ax_dxge, g8_dxge |
| X_cxp | ax_cxp, g8_cxp |
| ax_dsxge | ax_dsxge |

4 Device Control

4.1 Device Vendor Name

| | | |
|---------------------------|---|----------|
| Name | DeviceVendorName | Standard |
| Description | Name of the manufacturer of the device. | |
| Interface | String | |
| String length | 32 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | Chromasens GmbH | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.2 Device Model Name

| | | |
|---------------------------|----------------------|----------|
| Name | DeviceModelName | Standard |
| Description | Model of the device. | |
| Interface | String | |
| String length | 32 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.3 Device Manufacturer Info

| | | |
|---------------------------|--|----------|
| Name | DeviceManufacturerInfo | Standard |
| Description | Manufacturer information about the device. | |
| Interface | String | |
| String length | 48 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | Currently not visible. | |
| Error behavior | - | |

4.4 Device Version

| Name | DeviceVersion | Standard |
|---------------------------|------------------------|----------|
| Description | Version of the device. | |
| Interface | String | |
| String length | 32 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | Currently not visible. | |
| Error behavior | - | |

4.5 Device User ID

| Name | DeviceUserID | Standard |
|---------------------------|--------------------------------------|----------|
| Description | User-programmable device identifier. | |
| Interface | String | |
| String length | 16 | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | - | |
| Default value | Empty String | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.6 Device Scan Type

| Name | DeviceScanType | Standard |
|---------------------------|---|----------|
| Description | Scan type of the sensor. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entry table below. | |
| Default value | - | |
| Availability | ALL | |
| Notes | Even though the camera is a line scan device, this feature is set to Areascan. The camera supports frame trigger. | |
| Error behavior | - | |

Device Scan Type Enum Entries:

| Name | Description |
|----------|---|
| Areascan | The camera is operating in area scan mode |
| Linescan | The camera is operating in line scan mode |

4.7 Device Package Version

| Name | DevicePackageVersion | Custom |
|---------------------------|---|--------|
| Description | Version of the software package of the camera. The version is defined in the package description file. By querying the DevicePackageConsistency feature you can check whether a package is consistent. | |
| Interface | String | |
| String length | 16 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.8 Device Package Description

| Name | DevicePackageDescription | Custom |
|---------------------------|---|--------|
| Description | Description of the device's software package. | |
| Interface | String | |
| String length | 64 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.9 Device Package Consistency

| Name | DevicePackageConsistency | Custom |
|---------------------------|--|--------|
| Description | Executes a package consistency check. Is set to True if the package is consistent otherwise it is set to False . A package is consistent if the files on the camera correspond to the files in the package description file. | |
| Interface | Boolean | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | False : Package is not consistent True : Package is consistent | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.10 Device Sensor File Version

| | | |
|---------------------------|---|--------|
| Name | DeviceSensorFileVersion | Custom |
| Description | Version of the sensor file in the device. | |
| Interface | String | |
| String length | 40 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.11 Device Firmware Version

| | | |
|---------------------------|--|----------|
| Name | DeviceFirmwareVersion | Standard |
| Description | Version of the firmware in the device. | |
| Interface | String | |
| String length | 64 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.12 Device FPGA Version

| | | |
|---------------------------|------------------------------------|--------|
| Name | DeviceFPGAVersion | Custom |
| Description | Version of the FPGA in the device. | |
| Interface | String | |
| String length | 16 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.13 Device Product Number

| | | |
|---------------------------|-------------------------------|--------|
| Name | DeviceProductNumber | Custom |
| Description | Product number of the device. | |
| Interface | String | |
| String length | 32 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.14 Device Serial Number

| | | |
|---------------------------|------------------------------|----------|
| Name | DeviceSerialNumber | Standard |
| Description | Serial number of the device. | |
| Interface | String | |
| String length | 32 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.15 Device SFNC Version Major

| | | |
|---------------------------|--|----------|
| Name | DeviceSFNCVersionMajor | Standard |
| Description | Major version of the Standard Features Naming Convention that was used to create the device's GenICam XML. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | >0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.16 Device SFNC Version Minor

| | | |
|---------------------------|--|----------|
| Name | DeviceSFNCVersionMinor | Standard |
| Description | Minor version of the Standard Features Naming Convention that was used to create the device's GenICam XML. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |

4.17 Device SFNC Version SubMinor

| | | |
|---------------------------|--|----------|
| Name | DeviceSFNCVersionSubMinor | Standard |
| Description | Sub-minor version of the Standard Features Naming Convention that was used to create the device's GenICam XML. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |

4.18 Device Manifest XML Major Version

| | | |
|---------------------------|--|----------|
| Name | DeviceManifestXMLMajorVersion | Standard |
| Description | Indicates the major version number of the GenICam XML file of the selected manifest entry. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | ≥ 0 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.19 Device Manifest XML Minor Version

| | | |
|---------------------------|--|----------|
| Name | DeviceManifestXMLMinorVersion | Standard |
| Description | Indicates the minor version number of the GenICam XML file of the selected manifest entry. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |

4.20 Device Manifest XML Sub Minor Version

| | | |
|---------------------------|--|----------|
| Name | DeviceManifestXMLSubMinorVersion | Standard |
| Description | Indicates the sub-minor version number of the GenICam XML file of the selected manifest entry. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |

4.21 Device Temperature Selector

| | | |
|---------------------------|---|----------|
| Name | DeviceTemperatureSelector | Standard |
| Description | Selects the location within the device, where the temperature will be measured. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | See enum entry table below. | |
| Default value | Mainboard | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Device Temperature Selector Enum Entries:

| Name | Description |
|-----------|-----------------------------------|
| Mainboard | Temperature of the mainboard |
| Power1 | Temperature of the power module 1 |
| Power2 | Temperature of the power module 2 |
| Sensor | Temperature of the sensor |

4.22 Device Temperature

| | | |
|---------------------------|---|----------|
| Name | DeviceTemperature [DeviceTemperatureSelector] | Standard |
| Description | Device temperature in degrees Celsius. | |
| Interface | Float | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |

| | |
|----------------|---|
| Error behavior | - |
|----------------|---|

4.23 Device Voltage Selector

| | | |
|---------------------------|-----------------------------|--------|
| Name | DeviceVoltageSelector | Custom |
| Description | Selects a voltage source. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | See enum entry table below. | |
| Default value | Channel1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Device Voltage Selector Enum Entries:

| Name | Description |
|----------|-------------------|
| Channel1 | Selects Channel 1 |
| Channel2 | Selects Channel 2 |
| Channel3 | Selects Channel 3 |
| Channel4 | Selects Channel 4 |
| Channel5 | Selects Channel 5 |
| Channel6 | Selects Channel 6 |
| Channel7 | Selects Channel 7 |
| Channel8 | Selects Channel 8 |

4.24 Device Voltage

| | | |
|---------------------------|---|--------|
| Name | DeviceVoltage [DeviceVoltageSelector] | Custom |
| Description | Displays the voltage for the selected element. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | The unit of this feature is mV. | |
| Error behavior | - | |

4.25 Device Identify

| | | |
|---------------------------|---|--------|
| Name | DeviceIdentify | Custom |
| Description | Increases heartbeat speed for a short time to identify the camera. | |
| Interface | Command | |
| Access mode | Write only | |
| Adjustable while grabbing | Yes | |
| Value range | 1 | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | While grabbing images you will not see the heartbeat. Therefore, this only takes effect if the acquisition is not active. | |
| Error behavior | - | |

4.26 Device Reset

| | | |
|---------------------------|---|----------|
| Name | DeviceReset | Standard |
| Description | Resets the device to its power-up state. | |
| Interface | Command | |
| Access mode | Write only | |
| Adjustable while grabbing | Yes | |
| Value range | 1 | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | <p>This command always returns success.</p> <p>If you execute this command, the camera performs a power cycle. Afterwards you must reconnect to the camera.</p> | |
| Error behavior | - | |

4.27 Device Error Code

| | | |
|---------------------------|--|--------|
| Name | DeviceErrorCode | Custom |
| Description | Most recent error status of the camera. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See Device Error Code section for possible values. | |
| Default value | 0x00000000 | |
| Availability | ALL | |
| Notes | <p>Reads the most recent error. Zero indicates no error. Any other value indicates an error. If a write access to any register is performed (except bootstrap registers), the device error code is cleared.</p> <p>The DeviceErrorMessage feature holds the corresponding error description.</p> | |
| Error behavior | - | |

4.28 Device Error Message

| | | |
|---------------------------|--|--------|
| Name | DeviceErrorMessage | Custom |
| Description | Device error messages to the corresponding device error codes . | |
| Interface | Enumeration | |
| Access mode | Read Only | |
| Adjustable while grabbing | - | |
| Value range | See enum entry table below. | |
| Default value | Success | |
| Availability | ALL | |
| Notes | <p>This feature is "Invisible"</p> <p>The device error message consists of the tool tip and display name of the enum entry. Please check section Device Error Code too. There you will find the description of the enum entries.</p> | |
| Error behavior | - | |

4.29 Device TL Type

| | | |
|---------------------------|-------------------------------------|----------|
| Name | DeviceTLType | Standard |
| Description | Transport Layer type of the device. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entry table below. | |
| Default value | GigEVision | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Device TL Type Enum Entries:

| Name | Description |
|------------|-------------|
| GigEVision | GigE Vision |

4.30 Device Link Selector

| | | |
|---------------------------|--|----------|
| Name | DeviceLinkSelector | Standard |
| Description | Selects which link of the device to control. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | 0 | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.31 Device Link Connection Count

| | | |
|---------------------------|---|----------|
| Name | DeviceLinkConnectionCount[DeviceLinkSelector] | Standard |
| Description | Returns the number of physical connections of the device used by a particular Link. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.32 Device Average Resolution – Not Available for AllPIXA-EVO

| | | |
|---------------------------|---|--------|
| Name | DeviceAverageResolution | Custom |
| Description | Returns the average resolution in DPI (Dots Per Inch). | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |
| Default value | - | |
| Notes | Average resolution of the system in sensor direction. It is measured in factory and programmed to the device. | |
| Error behavior | - | |

4.33 Device TL Version Major

| | | |
|---------------------------|---|----------|
| Name | DeviceTLVersionMajor | Standard |
| Description | Major version of the Transport Layer of the device. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.34 Device TL Version Minor

| | | |
|---------------------------|---|----------|
| Name | DeviceTLVersionMinor | Standard |
| Description | Minor version of the Transport Layer of the device. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.35 Device TL Version Sub Minor

| | | |
|---------------------------|---|----------|
| Name | DeviceTLVersionSubMinor | Standard |
| Description | Sub-minor version of the Transport Layer of the device. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.36 Device Registers Endianness

| | | |
|---------------------------|--|----------|
| Name | DeviceRegistersEndianness | Standard |
| Description | Endianness of the registers of the device. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entry table below. | |
| Default value | Big | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Device Registers Endianness Enum Entries:

| Name | Description |
|---------------|--------------------------------------|
| <i>Little</i> | Device's registers are little Endian |
| <i>Big</i> | Device's registers are big Endian |

4.37 Device Character Set

| | | |
|---------------------------|--|----------|
| Name | DeviceCharacterSet | Standard |
| Description | Character set used by the strings of the device's bootstrap registers. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entry table below. | |
| Default value | UTF8 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Device Character Set Enum Entries:

| Name | Description |
|------|-------------|
| UTF8 | UTF 8 |

4.38 Device Event Channel Count

| | | |
|---------------------------|---|----------|
| Name | DeviceEventChannelCount | Standard |
| Description | Indicates the number of event channels supported by the device. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.39 Device Stream Channel Count

| | | |
|---------------------------|---|----------|
| Name | DeviceStreamChannelCount | Standard |
| Description | Indicates the number of streaming channels supported by the device. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.40 Device Link Heartbeat Timeout

| | | |
|---------------------------|--|----------|
| Name | DeviceLinkHeartbeatTimeout | Standard |
| Description | Controls the current heartbeat timeout of the specific Link. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥ 500000.0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | The unit is micro-seconds (μ s) | |
| Error behavior | - | |

4.41 Device Stream Channel Endianness

| | | |
|---------------------------|---|----------|
| Name | DeviceStreamChannelEndianness | Standard |
| Description | Endianness of multi-pixel data for this stream. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entry table below. | |
| Default value | Little | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Device Stream Channel Endianness Enum Entries:

| Name | Description |
|---------------|---------------------------------------|
| <i>Little</i> | Stream channel data is little Endian. |
| <i>Big</i> | Stream channel data is big Endian. |

4.42 Timestamp Reset

| | | |
|---------------------------|---|----------|
| Name | TimestampReset | Standard |
| Description | Resets the current value of the device timestamp counter. | |
| Interface | Command | |
| Access mode | Write only | |
| Adjustable while grabbing | Yes | |
| Value range | 1 | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.43 Timestamp Latch

| | | |
|---------------------------|---|----------|
| Name | TimestampLatch | Standard |
| Description | Latches current timestamp counter into TimestampLatchValue . | |
| Interface | Command | |
| Access mode | Write only | |
| Adjustable while grabbing | Yes | |
| Value range | 1 | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

4.44 Timestamp Latch Value

| | | |
|---------------------------|---|----------|
| Name | TimestampLatchValue | Standard |
| Description | Returns the latched value of the timestamp counter. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

5 Image Format Control

The parameters of this group describe how to influence and determine the image size and format. It also provides the necessary information to acquire and to display the image data. It assumes that the device has a source of data that generates a single rectangular image. This image can be entirely or partially streamed out of the device using one or many Region of interest (ROI).

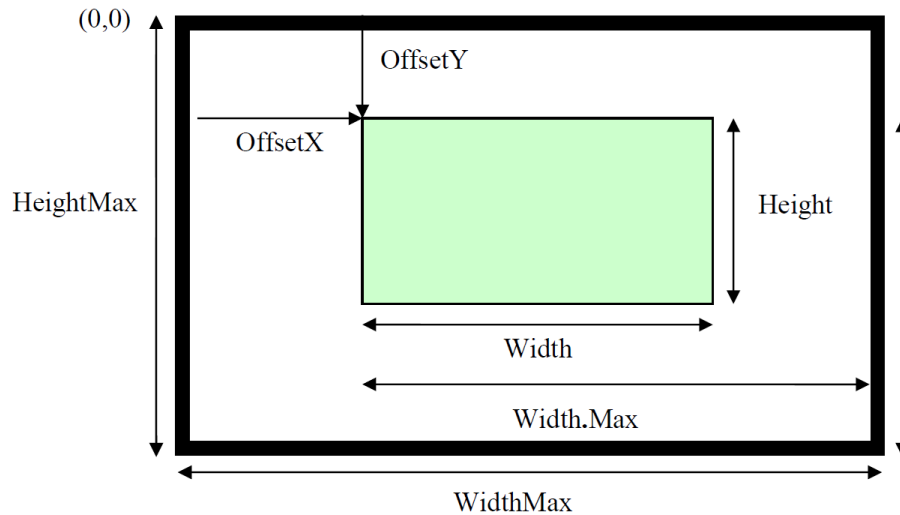


Image is taken from SFNC 2.4 p. 109

The sensor provides **Sensor Width** pixels.

The parameters **ReverseX** can be used to flip the image along the X-axis. The flipping is done before the Region of interest is applied.

Within the shrunk image the user can set a Region of interest using the parameters **OffsetX**, **Width**, and **Height**. The resulting image has **Width** time **Height** pixels. **OffsetX** refers to the upper left corner of the image which has the coordinate (0, 0).

The parameters **Region Selector** and **Region Mode** can be used to select and control each Region individually. All measures are given in pixel. As a result, the values should not change if the **Pixel Format** changes. For monochrome cameras, each pixel corresponds to a single gray value.

For color cameras in RGB mode each pixel corresponds to one RGB triplet.

The parameter **Height** describes the height of the image in lines.

5.1 Sensor Width

| | | |
|---------------------------|--|----------|
| Name | SensorWidth | Standard |
| Description | Effective width of the sensor in pixels. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | Depends on the built-in sensor. | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

5.2 Sensor Height

| | | |
|---------------------------|---|----------|
| Name | SensorHeight | Standard |
| Description | Effective height of the sensor in pixels. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | 1 | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

5.3 Sensor Color Type

| | | |
|---------------------------|----------------------------------|--------|
| Name | SensorColorType | Custom |
| Description | Specifies the sensor color type. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entry table below. | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Sensor Color Type Enum Entries:

| Name | Description |
|------------|-------------------|
| RGB | RGB Sensor |
| Monochrome | Monochrome Sensor |

5.4 Width Max

| Name | WidthMax | Standard |
|---------------------------|---|----------|
| Description | Maximum width of the image (in pixels). The dimension is calculated after horizontal binning, decimation or any other function changing the horizontal dimensions of the image. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | >0 | |
| Default value | SensorWidth | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

5.5 Height Max

| Name | HeightMax | Standard |
|---------------------------|---|----------|
| Description | Maximum height of the image (in pixels). This dimension is calculated after vertical binning, decimation or any other function changing the vertical dimensions of the image. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | >0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | The maximum height is 1015811 lines. | |
| Error behavior | - | |

5.6 Region Selector

| Name | RegionSelector | Standard |
|---------------------------|--|----------|
| Description | Selects the Region of interest to control. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | See enum entry table below. | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Region Selector Enum Entries:

| Name | Description |
|---------|---|
| Region1 | Selected feature will control the region 1 |
| Region2 | Selected feature will control the region 2. <i>For ax_dsxge only.</i> |

5.7 Region Mode

| | | |
|---------------------------|---|----------|
| Name | RegionMode[RegionSelector] | Standard |
| Description | Controls whether the selected Region of interest is active and streaming. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entry table below. | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Region Mode Enum Entries:

| Name | Description |
|------|--|
| Off | Disable usage of the Region. For ax_dsxge only |
| On | Enable usage of the Region. |

5.8 Width

| | | |
|---------------------------|--|----------|
| Name | Width[RegionSelector] | Standard |
| Description | Width of the Image provided by the device (in pixels). | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [8 , Width Max] | |
| Default value | WidthMax | |
| Availability | ALL | |
| Notes | The width value must be a multiple of eight for RGB. | |
| Error behavior | See the device error code documentation. | |

5.9 Height

| | | |
|---------------------------|---|----------|
| Name | Height[RegionSelector] | Standard |
| Description | Height of the Image provided by the device (in pixels). | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [16 , Height Max] | |
| Default value | 1024 | |
| Availability | ALL | |
| Notes | This parameter influences the value range of AcquisitionFrameRate . Please read the AcquisitionFrameRate feature documentation for further details. | |
| Error behavior | See the device error code documentation. | |

5.10 Offset X

| | | |
|---------------------------|--|----------|
| Name | OffsetX[RegionSelector] | Standard |
| Description | Horizontal offset from the origin to the region of interest (in pixels). | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | ≥0 | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

5.11 Sensor Region Offset X

| | | |
|---------------------------|---|--------|
| Name | SensorRegionOffsetX[RegionSelector] | Custom |
| Description | Horizontal offset from the origin to the region of interest in sensor coordinates (pixels). | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | No | |
| Value range | ≥ 0 | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | The display name is just Sensor Offset X. | |
| Error behavior | See the device error code documentation. | |

5.12 Sensor Region Width

| | | |
|---------------------------|--|--------|
| Name | SensorRegionWidth[RegionSelector] | Custom |
| Description | Width of the selected region of interest in sensor coordinates (in pixels). | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | No | |
| Value range | ≥ 0 | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | The display name is just Sensor Width. The feature resides below the Region Selector. There is a SensorWidth feature defining the sensor's full width which resides in the top level of the image format control category. | |
| Error behavior | See the device error code documentation. | |

5.13 Binning Horizontal

| | | |
|---------------------------|--|--------------------|
| Name | BinningHorizontal | Standard |
| Description | Number of horizontal photo-sensitive cells to combine. This increases the intensity (or signal-to-noise ratio) of the pixels and reduces the horizontal resolution (width) of the image. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | Variant | Value Range |
| | ax_X | 1,2,4,8,16 |
| | g8_X | 1,2,4,8,16 |
| Default value | 1 – Indicates that no horizontal binning is performed by the camera. | |
| Availability | ALL | |
| Notes | If you change this parameter, the Region OffsetX and Width is scaled according to the binning value. Please check these parameters after adapting Binning Horizontal. | |
| Error behavior | See the device error code documentation. | |

5.14 Decimation Horizontal Float

| | | |
|---------------------------|---|--------|
| Name | DecimationHorizontalFloat | Custom |
| Description | <p>This is the same feature as DecimationHorizontal as defined in the SFNC. However, it supports float values for decimation.</p> <p>Horizontal sub-sampling of the image. This reduces the horizontal resolution (width) of the image by the specified horizontal decimation factor.</p> | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [0.5 , 3.999] | |
| Default value | 1.0 | |
| Availability | g8_X | |
| Notes | <p>A value of 1 indicates that the camera performs no horizontal decimation. If you change this parameter, the Region OffsetX and Width are scaled according to the decimation value. Please check these parameters after adapting Decimation Horizontal.</p> <p>This feature is not available for all cameras of the allPIXA evo family.</p> | |
| Error behavior | See the device error code documentation. | |

5.15 Reverse X

| | | |
|---------------------------|---|----------|
| Name | ReverseX | Standard |
| Description | Flip the image sent by the device horizontally. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | True – Horizontally flipped image False – Normal Image | |
| Default value | False | |
| Availability | ALL | |
| Notes | This feature is effective only if Test Pattern is set to Off . | |
| Error behavior | - | |

5.16 Pixel Format

| | | |
|---------------------------|---|--------------|
| Name | PixelFormat | Standard |
| Description | Format of the pixels provided by the device. It represents all the information provided by PixelFormatSize , PixelFormatColorFilter combined in a single feature. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entry table below. | |
| Default value | Variant | Value |
| | Color Camera | RGB8 |
| | Mono Camera | Mono8 |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Pixel Format Enum Entries:

| Name | Availability | Description |
|--------|-----------------------|-------------------------------------|
| Mono8 | ALL | 8 bits per pixel Mono |
| Mono10 | X_cxp | 10 bits per pixel Mono unpacked |
| Mono12 | X_cxp | 12 bits per pixel Mono unpacked |
| RGB8 | ALL | 24 bits per pixel RGB linear memory |

| | | |
|----------|--|--|
| RGB10 | X_cxp | RGB at 10bit unpacked |
| RGB12 | X_cxp | RGB at 12bit unpacked |
| RGB10p32 | - | 32-bits per pixel RGB format. The bit depth is 10-bits. Please check the PFNC (Pixel Format Naming Convention) for more details – Not available for g8_dxge packages! |
| BGR8 | X_dxge ax_dsxge | 24 bits per pixel BGR linear memory |
| RGBa8 | g8_X | 32 bits per pixel RGBa linear memory |
| RGBa10 | g8_cxp | RGBa at 10bit unpacked. |

5.17 Pixel Color Filter

| | | |
|---------------------------|---|--------------|
| Name | PixelColorFilter | Standard |
| Description | Selects the type of color filter that is applied to an image. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entry table below. | |
| Default value | Variant | Value |
| | ax_X | RGB |
| | g8_X | RGBIr |
| | ALL (Mono Camera) | White |
| Availability | ALL | |
| Notes | For mono cameras the pixel color filter will be White only. | |
| Error behavior | See the device error code documentation. | |

Pixel Color Filter Enum Entries:

| Name | Availability | Description |
|-------|----------------------|--|
| RGB | ax_X | Three color planes RGB at the sensor is selected |
| RGBIr | g8_X | Four color planes RGB and Infrared at the sensor is selected |
| White | g8_X | Only White plane at the sensor is selected |

5.18 Infoblock Mode

| | | |
|---------------------------|---|----------|
| Name | InfoBlockMode | Standard |
| Description | The info block can be enabled for the first line, for each line or for first and each line. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | Enum entries table below. | |
| Default value | Infoblock off | |
| Availability | ALL | |
| Notes | So far not all entries are working. There may be even differences between variants of allPIXAevo. | |
| Error behavior | none | |

Info block Mode Entries:

| Name | Description |
|------------------|--|
| Off | No info block is displayed in the image. |
| Firstline | First line Info block which is in line 0 of each transmitted image is displayed. |
| Eachline | In each line from line 0 of each transmitted image the Each line info block is displayed. |
| FirstandEachLine | First and each line info block are displayed in each image. In case both FirstlineandEach line info block are active, Eachline info block is always displayed from line 1 in every transmitted image! |

First line info block format

| Pixel | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|--------|--------|------------------|---|---|---|--------|----------------|---|------------------|---|--------|-----------|----|-------------------|----|----|---------------|----|---------------|----|----|--------|----|----|
| Line 0 | MARKER | SERIAL NUMBER | | | | MARKER | IMAGE COUNT | | EXPOSURE TIME | | MARKER | LINE TIME | | ENCODER CLOCKS | | | ERROR CODE | | TIME STAMP | | | MARKER | | |

| Information | Channel Content ¹ | Description | | | | | | | | | | | | |
|-------------------------|------------------------------|--|-------------------|-------------------|-------------------|-------------------|----------------------|-----------------|-----------------|-----------------------|-------------------------|----|-------------------------|----|
| MARKER | DIVERSE | Markers are used to mark the info block with red pixels. <table><tr><td>Color</td><td>Red</td><td>Green</td><td>Blue</td></tr><tr><td>Value</td><td>255@8bit</td><td>0@8bit</td><td>0@8bit</td></tr></table> | Color | Red | Green | Blue | Value | 255@8bit | 0@8bit | 0@8bit | | | | |
| Color | Red | Green | Blue | | | | | | | | | | | |
| Value | 255@8bit | 0@8bit | 0@8bit | | | | | | | | | | | |
| SERIAL NUMBER | SAME | These pixels encode the serial number of the camera. <table><tr><td>Byte₃</td><td>Byte₂</td><td>Byte₁</td><td>Byte₀</td></tr><tr><td>P_{X1}</td><td>P_{X2}</td><td>P_{X3}</td><td>P_{X4}</td></tr><tr><td colspan="2">SN 1ST PART</td><td colspan="2">SN 2ND PART</td></tr></table> | Byte ₃ | Byte ₂ | Byte ₁ | Byte ₀ | P _{X1} | P _{X2} | P _{X3} | P _{X4} | SN 1 ST PART | | SN 2 ND PART | |
| Byte ₃ | Byte ₂ | Byte ₁ | Byte ₀ | | | | | | | | | | | |
| P _{X1} | P _{X2} | P _{X3} | P _{X4} | | | | | | | | | | | |
| SN 1 ST PART | | SN 2 ND PART | | | | | | | | | | | | |
| IMAGE COUNT | SAME | These pixels encode the image count of the camera. <table><tr><td>Byte₁</td><td>Byte₀</td></tr><tr><td>P_{X6}</td><td>P_{X7}</td></tr><tr><td colspan="2">IMAGE COUNT</td></tr></table> | Byte ₁ | Byte ₀ | P _{X6} | P _{X7} | IMAGE COUNT | | | | | | | |
| Byte ₁ | Byte ₀ | | | | | | | | | | | | | |
| P _{X6} | P _{X7} | | | | | | | | | | | | | |
| IMAGE COUNT | | | | | | | | | | | | | | |
| EXPOSURE TIME | SAME | <p>This is the current Exposure Time in camera internal clock cycles.</p> <table><tr><td>Byte₁</td><td>Byte₀</td></tr><tr><td>P_{X8}</td><td>P_{X9}</td></tr><tr><td colspan="2">EXPOSURE TIME CLOCKS</td></tr></table> <p>To decode the exposure time, use the following formula:</p> $ExposureTime = \frac{EXPOURE_TIME_CLOCKS}{f_a}$ <table><tr><td>Camera Variant</td><td>f_a in MHz</td></tr><tr><td>ax_X</td><td>50</td></tr><tr><td>g8_X</td><td>80</td></tr></table> | Byte ₁ | Byte ₀ | P _{X8} | P _{X9} | EXPOSURE TIME CLOCKS | | Camera Variant | f _a in MHz | ax_X | 50 | g8_X | 80 |
| Byte ₁ | Byte ₀ | | | | | | | | | | | | | |
| P _{X8} | P _{X9} | | | | | | | | | | | | | |
| EXPOSURE TIME CLOCKS | | | | | | | | | | | | | | |
| Camera Variant | f _a in MHz | | | | | | | | | | | | | |
| ax_X | 50 | | | | | | | | | | | | | |
| g8_X | 80 | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|----------------------|-----------------------|--|-------------------|-------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|------------------|----------------|-----------------------|----------------------|----|----------------------|----|
| LINE TIME | SAME | <p>This is the current line time in camera internal clock cycles.</p> <table><tr><td>Byte₂</td><td>Byte₁</td><td>Byte₀</td></tr><tr><td>PX₁₁</td><td>PX₁₂</td><td>PX₁₃</td></tr><tr><td colspan="3">LINE TIME CLOCKS</td></tr></table> <p>To decode the line time, use the following formula:</p> $LineTime = \frac{LINE_TIME_CLOCKS}{f_t}$ <table><tr><td>Camera Variant</td><td>f_t in MHz</td></tr><tr><td>ax X</td><td>75</td></tr><tr><td>g8 X</td><td>80</td></tr></table> | Byte ₂ | Byte ₁ | Byte ₀ | PX ₁₁ | PX ₁₂ | PX ₁₃ | LINE TIME CLOCKS | | | Camera Variant | f _t in MHz | ax X | 75 | g8 X | 80 |
| Byte ₂ | Byte ₁ | Byte ₀ | | | | | | | | | | | | | | | |
| PX ₁₁ | PX ₁₂ | PX ₁₃ | | | | | | | | | | | | | | | |
| LINE TIME CLOCKS | | | | | | | | | | | | | | | | | |
| Camera Variant | f _t in MHz | | | | | | | | | | | | | | | | |
| ax X | 75 | | | | | | | | | | | | | | | | |
| g8 X | 80 | | | | | | | | | | | | | | | | |
| ENCODER CLOCKS | SAME | <p>This is a 32-bit counter starting at power on with 0. These counts either the line trigger (LineStart) or Encoder pulses depending on the selected mode.</p> <table><tr><td>Byte₃</td><td>Byte₂</td><td>Byte₁</td><td>Byte₀</td></tr><tr><td>PX₁₄</td><td>PX₁₅</td><td>PX₁₆</td><td>PX₁₇</td></tr><tr><td colspan="4">ENCODER CLOCKS</td></tr></table> | Byte ₃ | Byte ₂ | Byte ₁ | Byte ₀ | PX ₁₄ | PX ₁₅ | PX ₁₆ | PX ₁₇ | ENCODER CLOCKS | | | | | | |
| Byte ₃ | Byte ₂ | Byte ₁ | Byte ₀ | | | | | | | | | | | | | | |
| PX ₁₄ | PX ₁₅ | PX ₁₆ | PX ₁₇ | | | | | | | | | | | | | | |
| ENCODER CLOCKS | | | | | | | | | | | | | | | | | |
| ERROR CODE | UNUSED | CURRENTLY UNUSED PRESET WITH ZERO | | | | | | | | | | | | | | | |
| TIMESTAMP | SAME | <p>Timestamp starts counting from boot.</p> <table><tr><td>Byte₂</td><td>Byte₁</td><td>Byte₀</td></tr><tr><td>PX₁₉</td><td>PX₂₀</td><td>PX₂₁</td></tr><tr><td colspan="2">SECONDS</td><td>$\frac{Ms^1}{4}$</td></tr></table> <p>¹MS= Milliseconds</p> <p>To achieve the milliseconds part of the timestamp the Content of PX₂₁ must be multiplied by four.</p> | Byte ₂ | Byte ₁ | Byte ₀ | PX ₁₉ | PX ₂₀ | PX ₂₁ | SECONDS | | $\frac{Ms^1}{4}$ | | | | | | |
| Byte ₂ | Byte ₁ | Byte ₀ | | | | | | | | | | | | | | | |
| PX ₁₉ | PX ₂₀ | PX ₂₁ | | | | | | | | | | | | | | | |
| SECONDS | | $\frac{Ms^1}{4}$ | | | | | | | | | | | | | | | |

¹ **SAME** indicates that all color channels contain the same value. It is sufficient to evaluate a single color component.

DIVERSE indicates different values for individual color channels which should be taken into account when composing the information.

Each Line info block format

| Pixel | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-------|--------------------------|------------|----------------|----------------|--------------------|------------|-------------|-------------|-------------|--------|
| RED | MARKER | ERROR CODE | SPEED2 HIGH | ENCODER CLOCKS | NEXT LINE POSITION | TIME STAMP | UNSUPPORTED | UNSUPPORTED | UNSUPPORTED | MARKER |
| GREEN | CONTINUOUS LINE COUNT | LINE COUNT | LINE TIME | | | | | | | |
| BLUE | | | | | | | | | | |

| Information | Channel Content ¹ | Description | | | | | | | | | | | | |
|-----------------------|------------------------------|--|-------------------|-------------------|-------------------|---------------------|-----------------------|----------------------|------------|-----------------|------------|---|--|--|
| CONTINUOUS LINE COUNT | DIVERSE | <p>This is the continuous line count across image boundaries.</p> <table><tr><td>-</td><td>Byte₁</td><td>Byte₀</td></tr><tr><td>PX₀Red</td><td>PX₀Green</td><td>PX₀Blue</td></tr><tr><td></td><td colspan="2">CONT LINE COUNT</td></tr></table> | - | Byte ₁ | Byte ₀ | PX ₀ Red | PX ₀ Green | PX ₀ Blue | | CONT LINE COUNT | | | | |
| - | Byte ₁ | Byte ₀ | | | | | | | | | | | | |
| PX ₀ Red | PX ₀ Green | PX ₀ Blue | | | | | | | | | | | | |
| | CONT LINE COUNT | | | | | | | | | | | | | |
| ERROR CODE | DIVERSE | <p>This is an error code. <i>Currently not used!</i></p> <table><tr><td>Byte₀</td><td>-</td><td>-</td></tr><tr><td>PX₁Red</td><td>PX₁Green</td><td>PX₁Blue</td></tr><tr><td>ERROR CODE</td><td colspan="2"></td></tr></table> | Byte ₀ | - | - | PX ₁ Red | PX ₁ Green | PX ₁ Blue | ERROR CODE | | | | | |
| Byte ₀ | - | - | | | | | | | | | | | | |
| PX ₁ Red | PX ₁ Green | PX ₁ Blue | | | | | | | | | | | | |
| ERROR CODE | | | | | | | | | | | | | | |
| LINE COUNT | DIVERSE | <p>This is a line counter starting from image start.</p> <table><tr><td>-</td><td>Byte₁</td><td>Byte₀</td></tr><tr><td>PX₁Red</td><td>PX₁Green</td><td>PX₁Blue</td></tr><tr><td></td><td colspan="2">LINE COUNT</td></tr></table> | - | Byte ₁ | Byte ₀ | PX ₁ Red | PX ₁ Green | PX ₁ Blue | | LINE COUNT | | | | |
| - | Byte ₁ | Byte ₀ | | | | | | | | | | | | |
| PX ₁ Red | PX ₁ Green | PX ₁ Blue | | | | | | | | | | | | |
| | LINE COUNT | | | | | | | | | | | | | |
| SPEED2HIGH | DIVERSE | <p>This bit is set if the line trigger exceeds the cameras maximum line rate. This is Bit7 of PX₁Red.</p> <table><tr><td>BIT7</td><td>BIT6</td><td>...</td><td>BIT0</td></tr><tr><td colspan="4">PX₂Red</td></tr><tr><td>SPEED2HIGH</td><td colspan="3">-</td></tr></table> | BIT7 | BIT6 | ... | BIT0 | PX ₂ Red | | | | SPEED2HIGH | - | | |
| BIT7 | BIT6 | ... | BIT0 | | | | | | | | | | | |
| PX ₂ Red | | | | | | | | | | | | | | |
| SPEED2HIGH | - | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|----------------------------|-----------------------|---|-------------------|-------------------|-------------------|-------------------|----------|---------|-----------------|---------|------------------|--|--|--|----------------|-----------------------|------|----|------|----|
| LINE TIME | DIVERSE | <p>This is the current measured line time in camera internal clock cycles.</p> <table><tr><td>BIT7...4</td><td>BIT3...0</td><td>Byte₁</td><td>Byte₀</td></tr><tr><td colspan="2">PX2Red</td><td>PX2Green</td><td>PX2Blue</td></tr><tr><td colspan="4">LINE TIME CLOCKS</td></tr></table> <p>To decode the line time, use the following formula:</p> $LineTime = \frac{LINE_TIME_CLOCKS}{f_t}$ <table><tr><td>Camera Variant</td><td>f_t in MHz</td></tr><tr><td>ax X</td><td>75</td></tr><tr><td>g8 X</td><td>80</td></tr></table> | BIT7...4 | BIT3...0 | Byte ₁ | Byte ₀ | PX2Red | | PX2Green | PX2Blue | LINE TIME CLOCKS | | | | Camera Variant | f _t in MHz | ax X | 75 | g8 X | 80 |
| BIT7...4 | BIT3...0 | Byte ₁ | Byte ₀ | | | | | | | | | | | | | | | | | |
| PX2Red | | PX2Green | PX2Blue | | | | | | | | | | | | | | | | | |
| LINE TIME CLOCKS | | | | | | | | | | | | | | | | | | | | |
| Camera Variant | f _t in MHz | | | | | | | | | | | | | | | | | | | |
| ax X | 75 | | | | | | | | | | | | | | | | | | | |
| g8 X | 80 | | | | | | | | | | | | | | | | | | | |
| ENCODER CLOCKS | DIVERSE | <p>This is a 24-bit counter starting at power on with 0. These counts either the line trigger (LineStart) or Encoder pulses depending on the selected mode.</p> <table><tr><td>Byte₂</td><td>Byte₁</td><td>Byte₀</td></tr><tr><td>PX3Red</td><td>PX3Green</td><td>PX3Blue</td></tr><tr><td colspan="3">ENCODER CLOCKS</td></tr></table> | Byte ₂ | Byte ₁ | Byte ₀ | PX3Red | PX3Green | PX3Blue | ENCODER CLOCKS | | | | | | | | | | | |
| Byte ₂ | Byte ₁ | Byte ₀ | | | | | | | | | | | | | | | | | | |
| PX3Red | PX3Green | PX3Blue | | | | | | | | | | | | | | | | | | |
| ENCODER CLOCKS | | | | | | | | | | | | | | | | | | | | |
| NEXT LINE TRIGGER POSITION | DIVERSE | <p>Information of the next line trigger position in encoder pulses (only at encoder mode). The calculated position is shown in a 16.8b value. If encoder averaging is used, the value is divided by the average size. At a slave camera, this field has the value zero.</p> <table><tr><td>Byte₂</td><td>Byte₁</td><td>Byte₀</td></tr><tr><td>PX4Red</td><td>PX4Green</td><td>PX4Blue</td></tr><tr><td colspan="3">NEXT LT POS RAW</td></tr></table> <p>To achieve the actual value, follow this formula:</p> $NextLTPos = \frac{NEXT_LT_POS_RAW}{256}$ | Byte ₂ | Byte ₁ | Byte ₀ | PX4Red | PX4Green | PX4Blue | NEXT LT POS RAW | | | | | | | | | | | |
| Byte ₂ | Byte ₁ | Byte ₀ | | | | | | | | | | | | | | | | | | |
| PX4Red | PX4Green | PX4Blue | | | | | | | | | | | | | | | | | | |
| NEXT LT POS RAW | | | | | | | | | | | | | | | | | | | | |
| TIMESTAMP | SAME | <p>Timestamp starts counting from boot.</p> <table><tr><td>Byte₂</td><td>Byte₁</td><td>Byte₀</td></tr><tr><td>PX5Red</td><td>PX5Green</td><td>PX5Blue</td></tr><tr><td colspan="2">SECONDS</td><td>$\frac{Ms^1}{4}$</td></tr></table> <p>¹MS= Milliseconds</p> <p>To achieve the milliseconds part of the timestamp the Content of PX5Blue must be multiplied by four.</p> | Byte ₂ | Byte ₁ | Byte ₀ | PX5Red | PX5Green | PX5Blue | SECONDS | | $\frac{Ms^1}{4}$ | | | | | | | | | |
| Byte ₂ | Byte ₁ | Byte ₀ | | | | | | | | | | | | | | | | | | |
| PX5Red | PX5Green | PX5Blue | | | | | | | | | | | | | | | | | | |
| SECONDS | | $\frac{Ms^1}{4}$ | | | | | | | | | | | | | | | | | | |

¹ **SAME** indicates that all color channels contain the same value. It is sufficient to evaluate a single color component.

DIVERSE indicates different values for individual color channels which should be taken into account when composing the information.

5.19 Test Pattern Generator Selector

| | | |
|---------------------------|--|----------|
| Name | TestPatternGeneratorSelector | Standard |
| Description | Selects which test pattern generator is controlled by the TestPattern feature. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entry table below. | |
| Default value | ImageProcessing | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Test Pattern Generator Selector Enum Entries:

| Name | Description |
|-----------------|---|
| ImageProcessing | TestPattern feature controls the Image Processing test pattern generator. |

5.20 Test Pattern

| | | |
|---------------------------|---|----------|
| Name | TestPattern[TestPatternGeneratorSelector] | Standard |
| Description | Selects the type of test pattern that is generated by the device as image source. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entry table below. | |
| Default value | Off | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Test Pattern Generator Selector Enum Entries:

| Name | Description |
|--------------------------|--|
| Off | Image is coming from the sensor. |
| GreyHorizontalRamp | Image is filled horizontally with pixels that go from the darkest possible value to the brightest. |
| GreyVerticalRamp | Image is filled vertically with pixels that go from the darkest possible value to the brightest. |
| GreyHorizontalRampMoving | Image is filled horizontally with pixels that go from the darkest possible value to the brightest and that move horizontally from left to right at each frame. |
| GreyVerticalRampMoving | Image is filled vertically with lines that go from the darkest possible value to the brightest and that move vertically from top to bottom at each frame. |
| ColorRamps | Horizontal ramp in red color channel. Vertical and horizontal ramp in green color channel. Vertical ramp in blue color channel. |
| TogglingPixels | Vertically and horizontally neighbored pixels have the inverse intensity value from each other. |
| PinStripes | Fixed pin stripe pattern with configurable background. The background is configurable with the test pattern value feature. |

5.21 Test Pattern Value

| | | |
|---------------------------|--|--------|
| Name | TestPatternValue [TestPatternGeneratorSelector] | Custom |
| Description | Test-Pattern-specific value that influences the appearance of the generated image. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [0 – 4095] | |
| Default value | 64 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

6 Acquisition Control

6.1 Acquisition Mode

| | | |
|---------------------------|---|----------|
| Name | AcquisitionMode | Standard |
| Description | Sets the acquisition mode of the device. It defines mainly the number of frames to capture during an acquisition and the way the acquisition stops. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | Continuous | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Acquisition Mode Enum Entries:

| Name | Description |
|-------------|--|
| Continuous | Frames are captured continuously until stopped with the AcquisitionStop command. |
| SingleFrame | One Frame is captured. |

6.2 Acquisition Start

| | | |
|---------------------------|---|----------|
| Name | AcquisitionStart | Standard |
| Description | Starts the Acquisition of the device. The number of frames captured is specified by AcquisitionMode . | |
| Interface | Command | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | 1 | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | Success is returned on successful start otherwise some error code. See the device error code documentation. | |

6.3 Acquisition Stop

| | | |
|---------------------------|---|----------|
| Name | AcquisitionStop | Standard |
| Description | Stops the Acquisition of the device at the end of the current Frame. | |
| Interface | Command | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [0, 1] For writing only command value 1 is supported. | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | The command will return immediately however it is not finished and will continue execution in background. As soon as the command value changes from 1 to 0 the command has finished. Features locked by TLPParamsLocked can be modified first after AcquisitionStop has finished execution completely. | |
| Error behavior | See the device error code documentation. | |

6.4 Acquisition Abort

| | | |
|---------------------------|--|----------|
| Name | AcquisitionAbort | Standard |
| Description | Aborts the Acquisition immediately. | |
| Interface | Command | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [0, 1] For writing only command value 1 is supported. | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | When command is executed, it aborts immediately even without completing the current frame. And TLParamsLocked will be set to 0 so that changing parameters should be possible. | |
| Error behavior | See the device error code documentation. | |

6.5 Exposure Time Mode

| | | |
|---------------------------|---|----------|
| Name | ExposureTimeMode | Standard |
| Description | Sets the configuration mode of the Exposure Time feature. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | Common | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Exposure Time Mode Enum Entries:

| Name | Availability | Description |
|------------|--------------|---|
| Common | ALL | The exposure time is common to all the color components. |
| Individual | g8_X | The exposure time is individual for each color component. |

6.6 Exposure Time Selector

| | | |
|---------------------------|---|----------|
| Name | ExposureTimeSelector | Standard |
| Description | Selects which exposure time is controlled by the Exposure Time feature. This allows for independent control over the exposure components. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | Common | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Exposure Time Selector Enum Entries:

| Name | Availability | Description |
|----------|--------------|------------------------------------|
| Common | ALL | Selects the common ExposureTime. |
| White | g8_X | Selects the White ExposureTime. |
| Infrared | g8_X | Selects the Infrared ExposureTime. |
| Red | g8_X | Selects the Red ExposureTime. |
| Green | g8_X | Selects the Green ExposureTime. |
| Blue | g8_X | Selects the Blue ExposureTime. |

6.7 Exposure Time

| | | |
|---------------------------|--|----------|
| Name | ExposureTime [ExposureTimeSelector] | Standard |
| Description | This controls the duration during which the photosensitive cells are exposed to light. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | The exposure time must be smaller than the Acquisition Line Time plus an offset. The minimum difference of Acquisition Line Time and ExposureTime are camera variant specific. Therefore, query the min and max entries of this feature. | |
| Default value | 30 | |
| Availability | ALL | |
| Notes | The unit is micro-seconds. | |
| Error behavior | See the device error code documentation. | |

6.8 Acquisition Integration Time – Deprecated

| | | |
|---------------------------|--|--------|
| Name | AcquisitionIntegrationTime | Custom |
| Description | Controls the integration time. (unit: micro-seconds) | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | See the value range of Exposure Time | |
| Default value | - | |
| Notes | This feature is deprecated please use Exposure Time instead. | |
| Error behavior | See the device error code documentation. | |

6.9 Acquisition Integration Time Min – Deprecated

| | | |
|---------------------------|--|--------|
| Name | AcquisitionIntegrationTimeMin | Custom |
| Description | Displays the minimum integration time. (unit: micro-seconds) | |
| Interface | Float | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | | |
| Default value | - | |
| Notes | This feature is deprecated; query the min and max values from Exposure Time instead. | |
| Error behavior | - | |

6.10 Acquisition Line Rate

| | | |
|---------------------------|---|----------|
| Name | AcquisitionLineRate | Standard |
| Description | Controls the rate (in Hertz) at which the Lines in a Frame are captured. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [(1 / Acquisition Line Time .Max), (1 / Acquisition Line Time .Min)] | |
| Default value | 18.18 KHz | |
| Availability | ALL | |
| Notes | This is the inverse of the Acquisition Line Time This feature is not available if MasterSlaveMode is configured as Slave or LedFlashEnable is enabled. | |
| Error behavior | See the device error code documentation. | |

6.11 Acquisition Line Rate Max – Deprecated

| | | |
|---------------------------|---|--------|
| Name | AcquisitionLineRateMax | Custom |
| Description | This value is calculated by the camera. It limits the AcquisitionLineRate . The unit is Hertz. | |
| Interface | Float | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Notes | Please use the min and max node entries of the Acquisition Line Rate feature. | |
| Error behavior | - | |

6.12 Acquisition Line Time

| | | |
|---------------------------|---|--------|
| Name | AcquisitionLineTime | Custom |
| Description | Controls the processing time per scan line. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | <p>The value range depends on:</p> <ul style="list-style-type: none"> - The transport layer configuration (Link configuration, packet size) - The region width - The Exposure Time - Reduction parameters Binning Horizontal , Decimation Horizontal Float <p>Query the min and max values of the acquisition line time feature to get the valid range for current setting.</p> <p>The exposure time always must be smaller than the line time: Range defined by exposure time: [Exposure Time + gap μs, 27900 μs]</p> <p>Gap = {ax_X = 1.5 ; g8_X = 2.0}</p> <p>Example range for gige-vision with one and two physical links connected.</p> <ol style="list-style-type: none"> 1. [37.43¹ μs, 27900 μs] – For single link (10Gbps) 2. [30.88¹ μs, 27900 μs] – For dual link (20Gbps) <p>¹ For Region Width: 15360, GevSCPSPacketSize: 8240 and AcquisitionFrameRate disabled.</p> | |
| Default value | 55 | |
| Availability | ALL | |
| Notes | <p>This is the inverse of the Acquisition Line Rate .</p> <p>If AcquisitionLineTime is set for higher values, then make sure to adopt image timeout to avoid timeout issues while grabbing.</p> <p>This parameter influences the value range of AcquisitionFrameRate. Please read the AcquisitionFrameRate feature documentation for further details.</p> <p>This feature is not available if MasterSlaveMode is configured as Slave or LedFlashEnable is enabled.</p> | |
| Error behavior | See the device error code documentation. | |

6.13 Acquisition Line Time Min – Deprecated

| | | |
|---------------------------|---|--------|
| Name | AcquisitionLineTimeMin | Custom |
| Description | Displays the minimum processing time per scan line in μs . | |
| Interface | Float | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | Exposure Time + 1.5 μs | |
| Default value | - | |
| Notes | Please query the min and max values of the Acquisition Line Time feature instead of using this feature. | |
| Error behavior | - | |

6.14 Acquisition Frame Rate Enable

| | | |
|---------------------------|---|----------|
| Name | AcquisitionFrameRateEnable | Standard |
| Description | Controls whether the AcquisitionFrameRate feature is writable and used to control the acquisition rate. Otherwise, the acquisition rate is implicitly controlled by the combination of other features such as AcquisitionLineTime . | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | True, False | |
| Default value | False | |
| Availability | ALL | |
| Notes | <p>The FrameActive and FrameStart triggers must be set to Off to enable this feature.</p> <p>This feature is not available if MasterSlaveMode is configured as Slave or LedFlashEnable is enabled.</p> | |
| Error behavior | See the device error code documentation. | |

6.15 Acquisition Frame Rate

| | | |
|---------------------------|---|----------|
| Name | AcquisitionFrameRate | Standard |
| Description | Controls the acquisition rate (in Hertz) at which the frames are captured. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | <p>The value range depends on the line time as well as on the image height:</p> <p><i>Min Acquisition Frame Rate:</i></p> $Min = \frac{1}{AcquisitionLineTime * (ImageHeight + 32764)}$ <p><i>Max Acquisition Frame Rate:</i></p> $Max = \frac{1}{AcquisitionLineTime * ImageHeight}$ | |
| Default value | 10 | |
| Availability | ALL | |
| Notes | <p>The Acquisition Frame Rate is based on the given AcquisitionLineTime even if a line trigger is used. Therefore, the real frame rate depends on the line trigger if this is used. The accuracy of this feature is limited.</p> <p>This feature is writeable only if AcquisitionFrameRateEnable is set to True.</p> | |

| | |
|----------------|--|
| | <p>Changing the image height or the acquisition line time influences the value range of the AcquisitionFrameRate. It may be that while these parameters are changed. The current value for the AcquisitionFrameRate gets out of range. In this case the real acquisition frame rate is clamped internally to the maximum possible frame rate.</p> <p>This feature is not available if MasterSlaveMode is configured as Slave or LedFlashEnable is enabled.</p> |
| Error behavior | See the device error code documentation. |

6.16 Time Delay Integration

| | | |
|---------------------------|--|--------|
| Name | TimeDelayIntegration | Custom |
| Description | Selects the number of photo-sensitive cells combined (average). | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [1, 3] | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | This feature is valid and available for the Mono Camera only. | |
| Error behavior | See the device error code documentation. | |

6.17 Master Slave Mode

| | | |
|---------------------------|--|--------|
| Name | MasterSlaveMode | Custom |
| Description | Specifies the master slave mode of the camera. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | Off | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Master Slave Mode Enum Entries:

| Name | Description |
|---------------------|--|
| Off | No master slave is selected. |
| Master | Selects the camera to be Master. |
| Slave | Selects the camera to be Slave. |
| AutoSelect | Automatically selects the camera to be either Master or Slave. |
| AutoSelect (Master) | This is available if AutoSelect is selected. If Line3 is in low level, then AutoSelect in Master mode. |
| AutoSelect (Slave) | This is available if AutoSelect is selected. If Line3 via pull-up(high level), then AutoSelect in Slave Mode. |

6.18 Master Slave Interface

| | | |
|---------------------------|---|--------|
| Name | MasterSlaveInterface[MasterSlaveMode] | Custom |
| Description | Specifies the interface type to be used for master/slave. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | External | |
| Availability | ALL | |
| Notes | Valid Interface configurations: Master (also for AutoSelect):: <ul style="list-style-type: none"> - External - Internal - External + Internal <i>Cascade is not supported for Master. If set it is neglected.</i> Slave (also for AutoSelect): <ul style="list-style-type: none"> - External - External + Cascade - External + Cascade + Internal - Internal | |
| Error behavior | See the device error code documentation. | |

Master Slave Interface Enum Entries:

| Name | Description |
|----------|--|
| External | Interface between master and slave camera is of external(physical) |
| Internal | Interface between master and slave camera is of internal |
| Cascade | Cascade interface for slave camera |

6.19 Master Slave Interface Enable

| | | |
|---------------------------|--|--------|
| Name | MasterSlaveInterfaceEnable[MasterSlaveInterface] | Custom |
| Description | Enables the selected master/slave interface. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | True – Enables selected master/slave interface. False – Disables selected master/slave interface. | |
| Default value | False | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

6.20 Slave DelayLines

| | | |
|---------------------------|--|--------|
| Name | MasterSlaveDelayLines | Custom |
| Description | Specifies the delay in number of lines for the slave camera. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [0 , 32764] | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | This feature is valid and available only for the Slave Camera . | |
| Error behavior | See the device error code documentation. | |

6.21 Trigger Selector

| | | |
|---------------------------|--|----------|
| Name | TriggerSelector | Standard |
| Description | Selects the type of trigger to configure. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | FrameStart | |
| Availability | ALL | |
| Notes | This feature is not available if MasterSlaveMode is configured as Slave. | |
| Error behavior | See the device error code documentation. | |

Trigger Selector Enum Entries:

| Name | Description |
|-------------|--|
| FrameStart | Selects a trigger starting the capture of one frame. |
| FrameActive | Selects a trigger controlling the duration of one frame. |
| LineStart | Selects a trigger starting the capture of one Line of a Frame. |

6.22 Trigger Mode

| | | |
|---------------------------|--|----------|
| Name | TriggerMode[TriggerSelector] | Standard |
| Description | Controls whether the selected trigger is active. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | Off | |
| Availability | ALL | |
| Notes | This feature is not available if MasterSlaveMode is configured as Slave. | |
| Error behavior | See the device error code documentation. | |

Trigger Mode Enum Entries:

| Name | Description |
|------|--------------------------------|
| Off | Disables the selected trigger. |
| On | Enables the selected trigger. |

6.23 Trigger Source

| | | |
|---------------------------|--|----------|
| Name | TriggerSource[TriggerSelector] | Standard |
| Description | Specifies the internal signal or physical input Line to use as the trigger source. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See the enum entries for more information. | |
| Default value | - | |
| Availability | ALL | |
| Notes | This feature is not available if MasterSlaveMode is configured as Slave. | |
| Error behavior | See the device error code documentation. | |

Trigger Source Enum Entries:

| Name | Description | Notes |
|----------|--|--|
| Encoder0 | Specifies Encoder0 signal to use as internal source for the trigger. | This enum entry is valid and available only for LineStart |
| Line1 | Specifies physical line (or pin) Line1 and associated I/O control block to use as external source for the trigger signal. | This enum entry is valid and available only for LineStart |

| | | |
|-------|--|--|
| Line2 | Specifies physical line (or pin) Line2 and associated I/O control block to use as external source for the trigger signal. | This enum entry is valid and available only for Frame Trigger |
| Line3 | Specifies physical line (or pin) Line3 and associated I/O control block to use as external source for the trigger signal. | This enum entry is valid and available for Frame or Line trigger |
| Line4 | Specifies physical line (or pin) Line4 and associated I/O control block to use as external source for the trigger signal. | This enum entry is valid and available for Frame or Line trigger |

6.24 Trigger Activation

| | | |
|---------------------------|--|-----------------|
| Name | TriggerActivation[TriggerSelector] | Standard |
| Description | Specifies the activation mode of the trigger. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Availability | ALL | |
| Notes | This feature is not available if MasterSlaveMode is configured as Slave. | |
| Error behavior | See the device error code documentation. | |

Trigger Activation Enum Entries:

| Name | Description | Notes |
|-------------|---|---|
| RisingEdge | Specifies that the trigger is considered valid on the rising edge of the source signal. | This enum entry is valid and available only for LineStart or FrameStart |
| FallingEdge | Specifies that the trigger is considered valid on the falling edge of the source signal. | This enum entry is valid and available only for FrameStart |
| LevelHigh | Specifies that the trigger is considered valid if the level of the source signal is high. | This enum entry is valid and available only for FrameActive |
| LevelLow | Specifies that the trigger is considered valid if the level of the source signal is low. | This enum entry is valid and available only for FrameActive |

6.25 Trigger DelayLines

| | | | | | | | | |
|---------------------------|--|--------|------------|--------|----------------|--------|-----------------|--------|
| Name | TriggerDelayLines[TriggerSelector] | Custom | | | | | | |
| Description | Specifies the delay in number of lines to apply after the trigger reception before activating it | | | | | | | |
| Interface | Integer | | | | | | | |
| Access mode | Read/Write | | | | | | | |
| Adjustable while grabbing | No | | | | | | | |
| Value range | [0 , 32764] | | | | | | | |
| Default value | 0 | | | | | | | |
| Availability | ALL | | | | | | | |
| Notes | <p>This feature is valid and available only for FrameStart and FrameActive. The accuracy of trigger delay lines is limited and depends on the value:</p> <table><tr><td>[0 , 8191]</td><td>step 1</td></tr><tr><td>[8192 , 16383]</td><td>step 2</td></tr><tr><td>[16384 , 32764]</td><td>step 4</td></tr></table> <p>This feature is not available if MasterSlaveMode is configured as Slave.</p> | | [0 , 8191] | step 1 | [8192 , 16383] | step 2 | [16384 , 32764] | step 4 |
| [0 , 8191] | step 1 | | | | | | | |
| [8192 , 16383] | step 2 | | | | | | | |
| [16384 , 32764] | step 4 | | | | | | | |
| Error behavior | See the device error code documentation. | | | | | | | |

6.26 Trigger Divider

| | | |
|---------------------------|--|----------|
| Name | TriggerDivider[TriggerSelector] | Standard |
| Description | Specifies a division factor for the incoming line trigger pulses | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [1 , 256] | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | This feature is valid and available only for LineStart and if MasterSlaveMode is not configured as Slave. | |
| Error behavior | See the device error code documentation. | |

6.27 Trigger Signal Detection Mode

| | | |
|---------------------------|--|--------|
| Name | TriggerSignalDetectionMode[TriggerSelector] | Custom |
| Description | Specifies the debounce type to be evaluated. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | FrameStart - PeakholderDetection FrameActive – Debouncing4Lines | |
| Availability | ALL | |
| Notes | This feature is valid and available only for FrameStart and FrameActive and if MasterSlaveMode is not configured as Slave. | |
| Error behavior | See the device error code documentation. | |

Trigger Signal Detection Mode Enum Entries:

| Name | Description |
|---------------------|---------------------|
| PeakholderDetection | Peakholder 15 lines |
| Debouncing4Clocks | Debouncing 4 clocks |
| Debouncing4Lines | Debouncing 4 lines |
| Debouncing60Lines | Debouncing 60 lines |

6.28 Extend Lines

| | | |
|---------------------------|--|--------|
| Name | FrameActiveExtendLines[TriggerSelector] | Custom |
| Description | Specifies the number of additional output lines for FrameActive . | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [0, 65535] | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | This feature is valid and available only for FrameActive and if MasterSlaveMode is not configured as Slave. | |
| Error behavior | See the device error code documentation. | |

6.29 Line Time (Measured)

| | | |
|---------------------------|---|--------|
| Name | MeasuredLineTime[TriggerSelector] | Custom |
| Description | Measure the processing time per scan line during line/encoder trigger in us. | |
| Interface | Float | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | In freerun this feature holds the same value as AcquisitionLineTime . During LineStart mode 'ON', it displays the actual line trigger speed. But in both cases the maximum line time it can display is 13,107 us. | |
| Default value | - | |
| Availability | ALL | |
| Notes | This feature is valid and available only for LineStart and if MasterSlaveMode is not configured as Slave. | |
| Error behavior | | |

6.30 Line Trigger Status

| | | |
|---------------------------|--|--------|
| Name | LineTriggerStatus[TriggerSelector] | Custom |
| Description | Display the line trigger status. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Availability | ALL | |
| Notes | This feature is valid and available only for LineStart and if MasterSlaveMode is not configured as Slave. | |
| Error behavior | - | |

Line Trigger Status Enum Entries:

| Name | Description |
|-------------|---------------|
| OK | OK |
| SpeedToHigh | Speed to high |

7 Analog Control

7.1 Gain Selector

| | | |
|---------------------------|---|----------|
| Name | GainSelector | Standard |
| Description | Selects which Gain is controlled by the Gain features. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | All – For color camera White – For mono camera | |
| Availability | ALL | |
| Notes | <p>The linear gain reflects the product of the analog and digital gain. Setting the linear gain will adapt the analog (if available) as well as the digital gain.</p> <p>The analog gain is not supported for all products. If the analog gain is not available, the digital gain is not displayed separately. In this case the linear gain reflects the digital gain value.</p> <p>If the gain is read while All/AnalogAll/DigitalAll is selected, an average of all available color channels depending on PixelFormat is returned. If the gain is written, the value is written to all color channels defined in PixelFormat. In case of using ColorToGrey the PixelFormat will be Mono but the color channels for reading and writing the gain value will be Red, Green and Blue.</p> | |
| Error behavior | See the device error code documentation. | |

Gain Selector Enum Entries:

| Name | Description |
|--------------|---|
| All | Selects linear gain of all available color channels. |
| Red | Selects linear gain red |
| Green | Selects linear gain green |
| Blue | Selects linear gain blue |
| White | Selects linear gain white |
| Infrared | Selects linear gain infrared |
| | |
| AnalogAll | Selects analog gain of all available color channels. |
| AnalogRed | Selects analog gain red |
| AnalogGreen | Selects analog gain green |
| AnalogBlue | Selects analog gain blue |
| AnalogWhite | Selects analog gain white |
| | |
| DigitalAll | Selects digital gain of all available color channels. |
| DigitalRed | Selects digital gain red |
| DigitalGreen | Selects digital gain green |
| DigitalBlue | Selects digital gain blue |
| DigitalWhite | Selects digital gain white |

7.2 Gain

| | | |
|---------------------------|---|----------|
| Name | Gain[GainSelector] | Standard |
| Description | This is an amplification factor applied to the video signal. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | <p>The value range varies for different camera variants. Therefore, query the value range from the feature parameters (min/max entries)</p> <p>However, for the digital gain the value range is the same for all camera variants.</p> <p>LinearGain = [DigitalMin * AnalogMin, DigitalMax * AnalogMax] AnalogGain = <i>camera dependent</i> DigitalGain = [1.0 , 3.999]</p> | |
| Default value | 1.0 | |
| Availability | ALL | |
| Notes | <p>This feature is available for Gain Selector</p> <p>You should create new DSNU reference when changing analog gain.</p> | |
| Error behavior | See the device error code documentation. | |

7.3 Gain Auto

| | | |
|---------------------------|---|----------|
| Name | GainAuto[GainSelector] | Standard |
| Description | Sets the automatic gain control (AGC) mode. The exact algorithm used to implement AGC is device-specific. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Off | |
| Availability | ALL | |
| Notes | <p>This feature is available only if Gain Selector is All or White (White for Mono cameras)</p> <p>The status of automatic gain control is reflected in GainAutoStatus feature.</p> <p>When the GainAuto feature has changed its value to Off after performing the "Once" or "AdjustTargetValueToMaxVideo" calibration, please query GainAutoStatus to check whether the automatic gain control was successful.</p> | |
| Error behavior | See the device error code documentation. | |

Gain Auto Enum Entries:

| Name | Description |
|-----------------------------|---|
| Off | Gain is user-controlled using Gain . |
| Once | Gain is automatically adjusted once by the device. Once it has converged, it automatically returns to the Off state. |
| Continuous | Gain is constantly adjusted by the device. |
| AdjustTargetValueToMaxVideo | <p>This process adjusts "Target value" for "GainControlRegion" that the resulting maximum video level fits to given "Target value". (see feature "Target value")</p> <p>Therefore, the Target value feature defines the target value for AdjustTargetValueToMaxVideo command but at the same time the command will adapt the same Target value feature.</p> <p>The adapted Target value will be the base for further GainAuto commands.</p> <p>Next to adapting the target values this command will perform <i>GainAuto Once</i> command implicitly.</p> |

| | |
|--|---|
| | After process has finished it automatically return to Off state. |
|--|---|

7.4 Gain Auto Status

| | | |
|---------------------------|---|-----------------|
| Name | GainAutoStatus | Standard |
| Description | Returns the state of the automatic gain control | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | Control off | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Gain Auto Enum Entries:

| Name | Description |
|-----------------------|--|
| ControlOff | No automatic gain control in progress. |
| ControlSuccessful | The automatic gain control was successfully performed. |
| ControlInProgress | The automatic gain control is in progress. |
| ControlStopped | Continuous gain control temporarily stopped. Gain stop control enabled; gain stop condition reached! |
| ReferenceTimeout | No reference data from the gain control region available! Camera might be in triggered mode. Probably there are no trigger pulses. |
| LowerGainLimit | Warning! The automatic gain control has reached lower gain limit! |
| UpperGainLimit | Warning! The automatic gain control has reached upper gain limit! |
| VideoLevelLowerLimit | Warning! Process " AdjustTargetValueToMaxVideo ", video level too low for target value adjustment |
| VideoLevelUpperLimit | Warning! Process " AdjustTargetValueToMaxVideo ", video level too high for target value adjustment |
| TargetValueOutOfRange | Warning! Process " AdjustTargetValueToMaxVideo ", adjusted target values are out of range |

7.5 Synchronization Mode Enable

| | | |
|---------------------------|---|---------------|
| Name | GainAutoSyncModeEnable | Custom |
| Description | Controls whether the gain control reference values are taken synchronous to frame start or independent of frame start. In case of synchronous mode is activated only one reference per frame will be captured. In case of asynchronous mode is inactive the reference values are taken continuously from image data stream. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – Enables synchronization mode False – Disables synchronization mode | |
| Default value | False | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

7.6 Stop Control Enable

| | | |
|---------------------------|--|--------|
| Name | GainAutoStopControlEnable | Custom |
| Description | Controls whether the gain auto continuous mode is limited according to the gain stop factor. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – Enables Gain Auto Stop Control False – Disables Gain Auto Stop Control | |
| Default value | False | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

7.7 Stop Factor

| | | |
|---------------------------|---|--------|
| Name | GainAutoStopFactor | Custom |
| Description | <p>The stop factor is used to limit the continuous gain control. The factor is multiplied with the target reference values. The result defines a threshold for the current reference values. Whenever the current reference values are equal or fall below the threshold, the continuous gain control is not performed till the current reference values are again larger than the threshold.</p> | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [0.0 , 1.0] | |
| Default value | 0.8 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

7.8 Gain Control Region Offset X

| | | |
|---------------------------|--|--------|
| Name | GainControlRegionOffsetX | Custom |
| Description | Sets the offset x of the gain control region. (in pixel) | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [2 , (SensorWidth - GainControlRegionWidth)] | |
| Default value | (SensorWidth / 2) - 48 | |
| Availability | ALL | |
| Notes | The minimal step of the value is one. | |
| Error behavior | See the device error code documentation. | |

7.9 Gain Control Region Width

| | | |
|---------------------------|--|--------|
| Name | GainControlRegionWidth | Custom |
| Description | Sets the width of the gain control region. (in pixels) | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [8 , 240] | |
| Default value | 48 | |
| Availability | ALL | |
| Notes | The step of the width is two. | |
| Error behavior | See the device error code documentation. | |

7.10 Gain Control Region Offset Y

| | | |
|---------------------------|---|--------|
| Name | GainControlRegionOffsetY | Custom |
| Description | Sets the offset y of the gain control region. (in pixels) | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | Frame trigger off: [3, Height – GainControlRegionHeight] Frame trigger on: [3 - TriggerDelayLines , 32767] | |
| Default value | 3 | |
| Availability | ALL | |
| Notes | This feature only takes effect if the Synchronization Mode Enable is set true! | |
| Error behavior | See the device error code documentation. | |

7.11 Gain Control Region Height

| | | |
|---------------------------|--|--------|
| Name | GainControlRegionHeight | Custom |
| Description | Sets the height of the gain control region. (in pixel) | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [2 , 240] | |
| Default value | 32 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

7.12 Gain Control Region visible

| | | |
|---------------------------|---|--------|
| Name | GainControlRegionVisible | Custom |
| Description | The borders of the gain control region are drawn into the image if enabled. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – Displays the borders of the gain control region False – Does not display the borders of the gain control region | |
| Default value | False | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

7.13 Average Samples

| | | |
|---------------------------|--|---------------|
| Name | GainAutoAverageSamples | Custom |
| Description | The number of reference samples which are averaged before doing a gain control step. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [1 , 32] | |
| Default value | 4 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

7.14 Gain Control Region Channel Selector

| | | |
|---------------------------|---|---------------|
| Name | GainControlRegionChannelSelector | Custom |
| Description | Selects the color channel to define the target intensity value or to read the current intensity value of the gain control region. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Red | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Gain Control Region Channel Selector Enum Entries:

| Name | Description |
|----------|---|
| All | <p>Selects all available channels for the actual PixelFormat to set the target value to same number.</p> <p>Reading the target value will return the average of all available channels for the current PixelFormat.</p> <p>Reading the current value will return the average of all available channels for the current PixelFormat.</p> |
| Red | Selects red channel to define the target intensity value or to read the current intensity value of the gain control region. |
| Green | Selects green channel to define the target intensity value or to read the current intensity value of the gain control region. |
| Blue | Selects blue channel to define the target intensity value or to read the current intensity value of the gain control region. |
| White | Selects white channel to define the target intensity value or to read the current intensity value of the gain control region. |
| Infrared | Selects InfraRed channel to define the target intensity value or to read the current intensity value of the gain control region. |

7.15 Target value

| | | |
|---------------------------|--|---------------|
| Name | GainControlRegionTargetValue[GainControlRegionChannelSelector] | Custom |
| Description | The target luminance intensity value of the selected channel in the gain control region. The bit depth of the value is 10-bit. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [0 , 1023] | |
| Default value | 700 | |
| Availability | ALL | |
| Notes | <p>Gain Auto “Once” or “Continuous”: Internal Gain Control adjusts gain values until current value of GainControlRegion have reached target values.</p> <p>Gain Auto “AdjustTargetValueToMaxVideo”: Target value determines the maximum video level which the raw image (without PRNU correction) should reach when doing gain adjustment with GainAuto (Once or Continuous). For that the camera adapts the Target value, until that criterion is fulfilled.</p> | |
| Error behavior | See the device error code documentation. | |

7.16 Current value

| | | |
|---------------------------|---|---------------|
| Name | GainControlRegionCurrentValue[GainControlRegionChannelSelector] | Custom |
| Description | The current luminance intensity value of the selected channel in the gain control region. The bit depth of the value is 10-bit. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

7.17 Sensor Sensitivity Channel Selector

| | | |
|---------------------------|--|--------|
| Name | SensorSensitivityChannelSelector | Custom |
| Description | Selects the color to be controlled for the sensor sensitivity. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Red | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Sensor Sensitivity Channel Selector Enum Entries:

| Name | Availability | Description |
|-------|--------------|---|
| All | ALL | Selects all color channels to control sensor sensitivity. If the sensor sensitivity is modified, the specified value is applied to all color channels. If you read the sensor sensitivity, the lastly set value is returned in this case. After a boot-up, 0 is returned. |
| White | ax_X | Selects white channel to control sensor sensitivity. |
| Red | ax_X | Selects red channel to control sensor sensitivity. |
| Green | ax_X | Selects green channel to control sensor sensitivity. |
| Blue | ax_X | Selects blue channel to control sensor sensitivity. |

7.18 Sensor Sensitivity

| | | |
|---------------------------|---|----------------------|
| Name | SensorSensitivity[SensorSensitivityChannelSelector] | Custom |
| Description | Controls the sensor sensitivity of the specified selector . | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | Variant | Min Value |
| | ax_X | 0 |
| | g8_X | 7 |
| Default value | Variant | Default Value |
| | ax_X | 2 |
| | g8_X | 4 |
| Availability | ALL | |
| Notes | You should create new DSNU/PRNU reference when changing this parameter. | |
| Error behavior | See the device error code documentation. | |

7.19 Gamma

| | | |
|---------------------------|---|----------|
| Name | Gamma | Standard |
| Description | Controls the gamma correction of pixel intensity. This is typically used to compensate for non-linearity of the display system (such as CRT). | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [0.1 – 2.5] | |
| Default value | 1.0 | |
| Availability | ALL | |
| Notes | The gamma values 0.2 – 2.5 behave corresponding to the standard gamma definition. The gamma value 0.1 enables a special sRGB gamma table. The gamma feature is effective only if the Gamma LUT is enabled. | |
| Error behavior | See the device error code documentation. | |

7.20 Brightness Contrast Enable

| | | |
|---------------------------|--|--------|
| Name | BrightnessContrastEnable | Custom |
| Description | Enable brightness and contrast image processing unit. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – Enables brightness and contrast image processing unit. False – Disables brightness and contrast image processing unit. | |
| Default value | False | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

7.21 Brightness Contrast Channel Selector

| | | |
|---------------------------|---|--------|
| Name | BrightnessContrastChannelSelector | Custom |
| Description | Selects the color channel to control the brightness and contrast. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Red | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Brightness Contrast Channel Selector Enum Entries:

| Name | Description |
|----------|--|
| Red | Brightness or Contrast will be applicable to the red channel. |
| Green | Brightness or Contrast will be applicable to the green channel. |
| Blue | Brightness or Contrast will be applicable to the blue channel. |
| White | Brightness or Contrast will be applicable to the white channel. |
| Infrared | Brightness or Contrast will be applicable to the infrared channel. |

7.22 Contrast

| | | |
|---------------------------|--|---------------|
| Name | BrightnessContrastGain [BrightnessContrastChannelSelector] | Custom |
| Description | Controls the contrast (gain) value for the selected color channel. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [0.0 , 1.999] | |
| Default value | 1.0 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

7.23 Brightness

| | | |
|---------------------------|--|---------------|
| Name | BrightnessContrastOffset [BrightnessContrastChannelSelector] | Custom |
| Description | Controls the brightness (offset) value for the selected color channel. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [-0.25 , 0.25] | |
| Default value | 0.0 | |
| Availability | ALL | |
| Notes | <p>The resulting brightness (offset) is defined by the features value multiplied with the maximum value of a pixel defined by the pixel formats bit-depth.</p> <p>Example:</p> <p>The maximum value of a pixel using the pixel format RGB8 (bit-depth 8-bit) is 255.</p> <p>Brightness value of 0.1 would increase the output pixel value by:</p> <p>Offset= 0.1x 255 = 25dn's</p> | |
| Error behavior | See the device error code documentation. | |

8 Image Calibration Control

8.1 Image Calibration Mode

| | | |
|---------------------------|--|--------|
| Name | ImageCalibrationMode | Custom |
| Description | Sets internal camera parameter for calibration DSNU or PRNU or even directly perform internal calibration . | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | Off | |
| Availability | ALL | |
| Notes | <p>Mode = ImageCalibrationModeDSNU / ImageCalibrationModePRNU: Features are set internally, so that raw, un-scaled and un-transformed image data is generated. With that image data DRNU or PSNU references can be calculated. If an affected feature is read, the modified value is returned. While ImageCalibrationMode is active, the internally changed features cannot be modified. When ImageCalibrationMode is set to Off, features are restored to their previous values.</p> <p>The following features are read-only when ImageCalibrationMode is enabled:</p> <ul style="list-style-type: none"> - ColorTransformationSelector - ColorTransformationEnable - BrightnessContrastEnable - DarkSignalNonUniformityReferenceOutput - PhotoResponseNonUniformityReferenceOutput - DecimationHorizontalFloat - BinningHorizontal - ReverseX - LutEnable - GainControlRegionVisible - UserSetLoad <p>The Image Calibration Mode for DSNU-creation will additionally disable digital gain. This is not reflected by the features.</p> <p>Mode = CalibrateDSNUInternal / CalibratePRNUInternal: Internal DSNU or PRNU calibration is done. All internal parameters are adapted automatically. Calibration data is written to LUT selected with Dark Signal Non-Uniformity (DSNU) Selector or Photo Response Non-Uniformity (PRNU) Selector.</p> <p>CalibrateDSNUInternal or CalibratePRNUInternal can directly be started from Mode=Off. ImageCalibrationModeDSNU or ImageCalibrationModePRNU must not be set before.</p> <p>After calibration has finished ImageCalibrationMode returns to previous state.</p> | |
| Error behavior | See the device error code documentation. | |

Image Calibration Mode Enum Entries:

| Name | Description |
|--------------------------|---|
| Off | |
| ImageCalibrationModeDSNU | Image from camera is prepared for DSNU calibration. Former <i>CalibrateDarkSignalNonUniformity</i> |

| | |
|--------------------------|---|
| ImageCalibrationModePRNU | Image from camera is prepared for PRNU calibration Former <i>CalibratePhotoResponseNonUniformity</i> |
| CalibrateDSNUInternal | Camera performs internal DSNU calibration |
| CalibratePRNUInternal | Camera performs internal PRNU calibration |

8.2 Dark Signal Non-Uniformity (DSNU) Selector

| | | |
|---------------------------|--|--------|
| Name | DarkSignalNonUniformitySelector | Custom |
| Description | Selects a DSNU LUT. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | LUT1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Dark Signal Non-Uniformity (DSNU) Selector Enum Entries:

| Name | Description |
|------|-----------------|
| LUT1 | Look-Up-Table 1 |
| LUT2 | Look-Up-Table 2 |

8.3 DSNU Dataset Information

| | | |
|---------------------------|--|--------|
| Name | DarkSignalNonUniformityDataSetInformation [DarkSignalNonUniformitySelector] | Custom |
| Description | Gives information of the selected DSNU LUT state. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Dark Signal Non-Uniformity (DSNU) Selector Enum Entries:

| Name | Description |
|----------------------|--|
| InactiveUnconfigured | The selected DSNU correction dataset is not used in the image processing pipeline of the camera and does not contain valid DSNU correction values. |
| InactiveConfigured | The selected DSNU correction dataset is not used in the image processing pipeline of the camera but contains valid DSNU correction values. |
| ActiveConfigured | The selected DSNU correction dataset is used in the image processing pipeline of the camera and contains valid DSNU correction values. |

8.4 DSNU Available Planes

| | | |
|---------------------------|--|--------|
| Name | DarkSignalNonUniformityAvailablePlains | Custom |
| Description | Indicates which color planes are available. | |
| Interface | Enumeration | |
| Access mode | Read Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Red | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

DSNU Available Planes Enum Entries:

| Name | Description |
|----------|---|
| Red | Selects red channel to read the first and last valid pixel values. |
| Green | Selects green channel to read the first and last valid pixel values. |
| Blue | Selects blue channel to read the first and last valid pixel values. |
| White | Selects white channel to read the first and last valid pixel values. |
| Infrared | Selects Infrared channel to read the first and last valid pixel values. |

8.5 First Valid Pixel

| | | |
|---------------------------|--|--------|
| Name | DarkSignalNonUniformityFirstPixelReg [DarkSignalNonUniformityAvailablePlains] | Custom |
| Description | Indicates first valid pixel. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

8.6 Last Valid Pixel

| | | |
|---------------------------|---|--------|
| Name | DarkSignalNonUniformityLastPixelReg [DarkSignalNonUniformityAvailablePlains] | Custom |
| Description | Indicates last valid pixel. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

8.7 DSNU Display Reference Values

| | | |
|---------------------------|---|--------|
| Name | DarkSignalNonUniformityReferenceOutput | Custom |
| Description | Displays the DSNU reference as a static output video. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – Displays the DSNU reference values False – Does not display the DSNU reference values | |
| Default value | False | |
| Availability | ALL | |
| Notes | This feature is available only if DSNU LUT is active and configured. This parameter is not stored in user set. | |
| Error behavior | See the device error code documentation. | |

8.8 Photo Response Non-Uniformity (PRNU) Selector

| | | |
|---------------------------|--|--------|
| Name | PhotoResponseNonUniformitySelector | Custom |
| Description | Selects a PRNU LUT. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | LUT1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Photo Response Non-Uniformity (PRNU) Selector Enum Entries:

| Name | Description |
|------|-----------------|
| LUT1 | Look-Up-Table 1 |
| LUT2 | Look-Up-Table 2 |

8.9 PRNU Dataset Information

| | | |
|---------------------------|--|--------|
| Name | PhotoResponseNonUniformityDataSetInformation [PhotoResponseNonUniformitySelector] | Custom |
| Description | Gives information of the selected PRNU LUT state. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Photo Response Non-Uniformity (DSNU) Selector Enum Entries:

| Name | Description |
|----------------------|--|
| InactiveUnconfigured | The selected PRNU correction dataset is not used in the image processing pipeline of the camera and does not contain valid PRNU correction values. |
| InactiveConfigured | The selected PRNU correction dataset is not used in the image processing pipeline of the camera but contains valid PRNU correction values. |
| ActiveConfigured | The selected PRNU correction dataset is used in the image processing pipeline of the camera and contains valid PRNU correction values. |

8.10 PRNU Available Planes

| | | |
|---------------------------|--|--------|
| Name | PhotoResponseNonUniformityAvailablePlains | Custom |
| Description | Indicates first valid pixel. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | | |
| Default value | Red | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

PRNU Available Planes Enum Entries:

| Name | Description |
|----------|---|
| Red | Selects red channel to read the first and last valid pixel values. |
| Green | Selects green channel to read the first and last valid pixel values. |
| Blue | Selects blue channel to read the first and last valid pixel values. |
| White | Selects red channel to read the first and last valid pixel values. |
| Infrared | Selects Infrared channel to read the first and last valid pixel values. |

8.11 First Valid Pixel

| | | |
|---------------------------|--|--------|
| Name | PhotoResponseNonUniformityFirstPixelReg [PhotoResponseNonUniformityAvailablePlains] | Custom |
| Description | Indicates first valid pixel. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

8.12 Last Valid Pixel

| | | |
|---------------------------|---|--------|
| Name | PhotoResponseNonUniformityLastPixelReg [PhotoResponseNonUniformityAvailablePlains] | Custom |
| Description | Indicates last valid pixel. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

8.13 PRNU Display Reference Values

| | | |
|---------------------------|--|--------|
| Name | PhotoResponseNonUniformityReferenceOutput | Custom |
| Description | Displays the PRNU reference as a static output video. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – Display the PRNU reference values False – Do not display the PRNU reference values | |
| Default value | False | |
| Availability | ALL | |
| Notes | This feature is valid and available only if PRNU LUT is active and configured. This parameter is not stored in user set. | |
| Error behavior | See the device error code documentation. | |

8.14 Line Distance

| | | |
|---------------------------|---|------------------|
| Name | ImageCalibrationLineDistance | Custom |
| Description | This feature is used to compensate the line distance of the sensors color channels. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | Variant | Min Value |
| | ax X | 0.0 |
| | g8 X | 0.0 |
| | | Max Value |
| | | 2.0 |
| | | 3.0 |
| Default value | 2.0 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

8.15 Scan Direction Source

| | | |
|---------------------------|--|--------|
| Name | ScanDirectionSource | Custom |
| Description | Selects the scan direction source. | |
| Interface | Enumeration | |
| Access mode | Read Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Internal | |
| Availability | ALL | |
| Notes | This feature is not available if MasterSlaveMode is configured as Slave. | |
| Error behavior | See the device error code documentation. | |

Scan Direction Source Enum Entries:

| Name | Description |
|----------|---|
| Internal | Specifies internal scanning direction source |
| Line3 | Specifies scanning direction source by the level of Line3 |
| Encoder0 | Specifies scanning direction source by Encoder0 |

8.16 Scan Direction

| | | |
|---------------------------|--|--------|
| Name | ImageCalibrationScanDirection[ScanDirectionSource] | Custom |
| Description | Controls scan direction processing. | |
| Interface | Enumeration | |
| Access mode | Read Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Forward | |
| Availability | ALL | |
| Notes | <p>This feature is not available if MasterSlaveMode is configured as Slave.</p> <p>This feature is writable only if ScanDirectionSource is Internal otherwise Read only.</p> | |
| Error behavior | See the device error code documentation. | |

Scan Direction Enum Entries:

| Name | Description |
|----------|--|
| Forward | Specifies forward scanning direction of the camera (RGB). |
| Backward | Specifies backward scanning direction of the camera (BGR). |

8.17 Image Center Offset – Not Available for AllPIXA-EVO

| | | |
|---------------------------|---|--------|
| Name | ImageCenterOffset | Custom |
| Description | Displays the pixel offset between sensor center and scan target center. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ -15000 | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

9 Color Transformation Control

9.1 Color Transformation Selector

| | | |
|---------------------------|--|----------|
| Name | ColorTransformationSelector | Standard |
| Description | Selects which Color Transformation module is controlled by the various color transformation features. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | ColortoColor | |
| Availability | ALL (Not available for mono cameras) | |
| Notes | <p>The transformations are defined as follows:</p> <p>Color to Color</p> $\begin{pmatrix} R_{out} \\ G_{out} \\ B_{out} \\ A_{out} \end{pmatrix} = \begin{pmatrix} Gain_{00} & Gain_{01} & Gain_{02} & Gain_{03} \\ Gain_{10} & Gain_{11} & Gain_{12} & Gain_{13} \\ Gain_{20} & Gain_{21} & Gain_{22} & Gain_{23} \\ Gain_{30} & Gain_{31} & Gain_{32} & Gain_{33} \end{pmatrix} \begin{pmatrix} R_{in} \\ G_{in} \\ B_{in} \\ A_{in} \end{pmatrix} + \begin{pmatrix} Offset_0 \\ Offset_1 \\ Offset_2 \\ Offset_3 \end{pmatrix}$ <p>In case of RGB pixel format the fourth entry <i>A</i> has no meaning. <i>A</i> could contain <i>Ir</i> color component for some camera variants.</p> <p>Color to Grey</p> $M_{out} = (Gain_0 \quad Gain_1 \quad Gain_2 \quad Gain_3) \begin{pmatrix} R_{in} \\ G_{in} \\ B_{in} \\ A_{in} \end{pmatrix}$ <p>Attention: For current implementation color to grey is supported only for RGB. So the formula reduces to $Gain_{0-2}$ and RGB!</p> <p>Use Color Transformation Value Selector and Color Transformation Value to set the coefficients.</p> | |
| Error behavior | See the device error code documentation. | |

Color Transformation Selector Enum Entries:

| Name | Description |
|--------------|----------------|
| ColortoColor | Color to color |
| ColortoGrey | Color to grey |

9.2 Color Transformation Enable

| | | |
|---------------------------|--|----------|
| Name | ColorTransformationEnable[ColorTransformationSelector] | Standard |
| Description | Activates the selected Color Transformation module. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | True – Enables the selected color transformation module False – Disables the selected color transformation module | |
| Default value | False | |
| Availability | ALL (Not available for mono cameras) | |
| Notes | If the ColortoGrey module is disabled, the pixel format internally is changed to RGB8. | |
| Error behavior | See the device error code documentation. | |

9.3 Color Transformation Value Selector

| | | |
|---------------------------|---|----------|
| Name | ColorTransformationValueSelector | Standard |
| Description | Selects the Gain factor or Offset of the transformation matrix to access in the selected color transformation module. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Gain00 – For ColortoColor module Gain0 – For ColortoGrey module | |
| Availability | ALL (Not available for mono cameras) | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Color Transformation Value Selector Enum Entries:

Color to Color

| Name | Description |
|---------|---|
| Gain00 | Gain 0, 0 of the transformation matrix. |
| Gain01 | Gain 0, 1 of the transformation matrix. |
| Gain02 | Gain 0, 2 of the transformation matrix. |
| Gain03 | Gain 0, 3 of the transformation matrix. |
| Gain10 | Gain 1, 0 of the transformation matrix. |
| Gain11 | Gain 1, 1 of the transformation matrix. |
| Gain12 | Gain 1, 2 of the transformation matrix. |
| Gain13 | Gain 1, 3 of the transformation matrix. |
| Gain20 | Gain 2, 0 of the transformation matrix. |
| Gain21 | Gain 2, 1 of the transformation matrix. |
| Gain22 | Gain 2, 2 of the transformation matrix. |
| Gain23 | Gain 2, 3 of the transformation matrix. |
| Gain30 | Gain 3, 0 of the transformation matrix. |
| Gain31 | Gain 3, 1 of the transformation matrix. |
| Gain32 | Gain 3, 2 of the transformation matrix. |
| Gain33 | Gain 3, 3 of the transformation matrix. |
| Offset0 | Offset 0 of the transformation matrix. |
| Offset1 | Offset 1 of the transformation matrix. |
| Offset2 | Offset 2 of the transformation matrix. |
| Offset3 | Offset 3 of the transformation matrix. |

Color to Grey

| Name | Description |
|-------|---|
| Gain0 | Gain 1, 0 of the transformation matrix. |
| Gain1 | Gain 1, 1 of the transformation matrix. |

| | |
|-------|---|
| Gain2 | Gain 1, 2 of the transformation matrix |
| Gain3 | Gain 1, 2 of the transformation matrix. |

9.4 Color Transformation Value

| | | |
|---------------------------|--|----------|
| Name | ColorTransformationValue[ColorTransformationValueSelector] | Standard |
| Description | Represents the value of the selected Gain factor or Offset inside the transformation matrix. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [-2.0 , 2.0] – For Gain selector [-0.5, 0.5] – For Offset selector | |
| Default value | - | |
| Availability | ALL (Not available for mono cameras) | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

10 LUT Control

10.1 LUT Selector

| | | |
|---------------------------|--|----------|
| Name | LUTSelector | Standard |
| Description | Selects which LUT to control. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See the enum entries table below. | |
| Default value | Gamma | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

LUT Selector Enum Entries:

| Name | Description |
|--------------------------------|------------------------|
| Gamma | Selects the Gamma LUT |
| DarkSignalNonUniformityLUT1 | Selects the DSNU LUT 1 |
| DarkSignalNonUniformityLUT2 | Selects the DSNU LUT2 |
| PhotoResponseNonUniformityLUT1 | Selects the PRNU LUT1 |
| PhotoResponseNonUniformityLUT2 | Selects the PRNU LUT2 |

10.2 LUT Enable

| | | |
|---------------------------|---|----------|
| Name | LUTEnable[LUTSelector] | Standard |
| Description | Activates/Deactivates the selected LUT. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – Activates the selected LUT False – Deactivates the selected LUT | |
| Default value | False | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

10.3 LUT Dataset Name

| | | |
|---------------------------|--|--------|
| Name | LUTDatasetNameReg[LUTSelector] | Custom |
| Description | Leave a comment here to describe the chosen LUT. | |
| Interface | String | |
| String length | 32 | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | - | |
| Default value | - | |
| Availability | ALL | |
| Notes | This feature is not available for Gamma . | |
| Error behavior | - | |

11 User Set Control

11.1 Loaded User Set

| | | |
|---------------------------|--|--------|
| Name | LoadedUserSet | Custom |
| Description | Specifies the last loaded user set. | |
| Interface | String | |
| String length | 32 | |
| Access mode | Read Only | |
| Adjustable while grabbing | Yes | |
| Value range | - | |
| Default value | Default | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

11.2 User Set Selector

| | | |
|---------------------------|--|----------|
| Name | UserSetSelector | Standard |
| Description | Selects the feature User Set to load, save or configure. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | UserSet1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

User Set Selector Enum Entries:

| Name | Description |
|----------|-----------------------|
| UserSet1 | Selects the UserSet 1 |
| UserSet2 | Selects the UserSet 2 |
| UserSet3 | Selects the UserSet 3 |
| UserSet4 | Selects the UserSet 4 |
| UserSet5 | Selects the UserSet 5 |
| UserSet6 | Selects the UserSet 6 |
| UserSet7 | Selects the UserSet 7 |
| UserSet8 | Selects the UserSet 8 |
| Default | Selects the Default |

11.3 User Set Load

| | | |
|---------------------------|--|----------|
| Name | UserSetLoad [UserSetSelector] | Standard |
| Description | Loads the User Set specified by UserSetSelector to the device and activates it. | |
| Interface | Command | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | 1 | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

11.4 User Set Save

| | | |
|---------------------------|---|----------|
| Name | UserSetSave[UserSetSelector] | Standard |
| Description | Save the current user settings to the selected user set in the non-volatile memory of the device. | |
| Interface | Command | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | 1 | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | Default is Read only. | |
| Error behavior | See the device error code documentation. | |

11.5 User Set Comment

| | | |
|---------------------------|--|--------|
| Name | UserSetComment[UserSetSelector] | Custom |
| Description | Leave a comment here to describe the chosen setting. | |
| Interface | String | |
| String length | 32 | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | - | |
| Default value | Default | |
| Availability | ALL | |
| Notes | Default user set is Read only. When executing User Set Save the comment of the active user set is stored to flash. | |
| Error behavior | See the device error code documentation. | |

12 Transport Layer Control

12.1 TLParamsLocked

| | | |
|---------------------------|--|----------|
| Name | TLParamsLocked | Standard |
| Description | This feature is used to lock critical features from changing during acquisition. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [0, 1] 0 – No features are locked 1 – Critical features are locked and cannot be changed | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

12.2 Payload Size

| | | |
|---------------------------|---|----------|
| Name | PayloadSize | Standard |
| Description | Provides the number of bytes transferred for each image or chunk on the stream channel. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

12.3 Device Tap Geometry

| | | |
|---------------------------|---|----------|
| Name | DeviceTapGeometry | Standard |
| Description | This describes the geometrical properties characterizing the taps of a camera as presented at the output of the device. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries below. | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

Device Tap Geometry Enum Entries:

| Name | Description |
|----------------|--------------------|
| Geometry_1X_1Y | 1X 1Y tap geometry |

12.4 GigE Vision

12.4.1 Gev Version Major

| | | |
|---------------------------|---|----------|
| Name | GevVersionMajor | Standard |
| Description | Major version of the specification. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | >0 | |
| Default value | - | |
| Notes | This feature is deprecated (See DeviceTLVersionMajor). | |
| Error behavior | - | |

12.4.2 Gev Version Minor

| | | |
|---------------------------|---|----------|
| Name | GevVersionMinor | Standard |
| Description | Minor version of the specification. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |
| Default value | - | |
| Notes | This feature is deprecated (See DeviceTLVersionMinor). | |
| Error behavior | - | |

12.4.3 Gev Device Mode Is Big Endian

| | | |
|---------------------------|--|----------|
| Name | GevDeviceModelsBigEndian | Standard |
| Description | Endianness of the device registers. | |
| Interface | Boolean | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | True – Represents the endianness of the device registers False – Does not represents the Endianness of the device registers | |
| Default value | - | |
| Notes | This feature is deprecated (See DeviceRegistersEndianness). | |
| Error behavior | - | |

12.4.4 Gev Device Mode Character Set

| | | |
|---------------------------|---|----------|
| Name | GevDeviceModeCharacterSet | Standard |
| Description | Character set used by all the strings of the bootstrap registers. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | UTF8 | |
| Notes | This feature is deprecated (See DeviceCharacterSet). | |
| Error behavior | - | |

Gev Device Mode Character Set Enum Entries:

| Name | Description |
|------|-------------|
| UTF8 | UTF 8 |

12.4.5 Gev Interface Selector

| | | |
|---------------------------|--|----------|
| Name | GevInterfaceSelector | Standard |
| Description | Selects which physical network interface to control. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | 0 | |
| Default value | 0 | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.6 Gev MACAddress

| | | |
|---------------------------|--|----------|
| Name | GevMACAddress [GevInterfaceSelector] | Standard |
| Description | MAC address of the network interface. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.7 Gev Supported Option Selector

| | | |
|---------------------------|---|----------|
| Name | GevSupportedOptionSelector | Standard |
| Description | Selects the GEV option to interrogate for existing support. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

Gev Supported Option Selector Enum Entries:

| Name | Description |
|---------------------------|--|
| UserDefinedName | Indicates if the Userdefined name register is supported. |
| SerialNumber | Indicates if the Serial number register is supported. |
| HeartbeatDisable | Indicates if the Heartbeat can be disabled. |
| LinkSpeed | Indicates if the Link Speed registers are supported. |
| CCPApplicationSocket | Indicates if the CCP Application Port and IP address registers are supported. |
| ManifestTable | Indicates if the Manifest Table is supported. |
| TestData | Indicates if the test packet is filled with data from the LFSR generator. |
| DiscoveryAckDelay | When Discovery ACK Delay register is supported, this bit indicates that the application can write it. If this bit is 0, the register is read-only. |
| DiscoveryAckDelayWritable | Indicates if the Discovery ACK Delay register is supported. |
| ExtendedStatusCodes | It indicates if the generation of extended status codes is supported. |

| | |
|--------------------------------------|---|
| PrimaryApplicationSwitchover | It indicates if the authenticate primary application switchover requests are supported. |
| Action | It indicates if Actions are supported. |
| PendingAck | It indicates if the generation of PENDING_ACK is supported. |
| EventData | It indicates if the EVENTDATA_CMD and EVENTDATA_ACK are supported. |
| Event | It indicates if the EVENT_CMD and EVENT_ACK are supported. |
| PacketResend | It indicates if the PACKETRESEND_CMD is supported. |
| WriteMem | It indicates if the WRITEMEM_CMD and WRITEMEM_ACK are supported. |
| CommandsConcatenation | It indicates if the Multiple operations in a single message are supported. |
| IPConfigurationLLA | It indicates if Link Local Address IP configuration scheme is supported. |
| IPConfigurationDHCP | It indicates if DHCP IP configuration scheme is supported. |
| IPConfigurationPersistentIP | It indicates if PersistentIP configuration scheme is supported. |
| StreamChannelSourceSocket | Indicates the SCSP register (stream channel source port) is available. |
| MessageChannelSourceSocket | Indicates the MCSP register (message channel source port) is available. |
| StreamChannel0BigAndLittleEndian | Stream Channel0 Big And Little Endian. |
| StreamChannel0IPReassembly | Stream Channel0 IP Reassembly |
| StreamChannel0UnconditionalStreaming | Stream Channel0 Unconditional Streaming. |
| StreamChannel0ExtendedChunkData | Stream Channel0 Extended Chunk Data. |

12.4.8 Gev Supported Option

| | | |
|---------------------------|---|-----------------|
| Name | GevSupportedOption[GevSupportedOptionSelector] | Standard |
| Description | Returns if the selected GEV option is supported. | |
| Interface | Boolean | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | True – Selected GEV option is supported False – Selected GEV option is not supported | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.9 Gev Current IP Configuration LLA

| | | |
|---------------------------|---|-----------------|
| Name | GevCurrentIPConfigurationLLA[GevInterfaceSelector] | Standard |
| Description | Indicates if Link Local Address IP configuration scheme is activated on the given network interface. | |
| Interface | Boolean | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | True – Link Local Address IP configuration scheme is activated on the given logical link. False – Link Local Address IP configuration scheme is not activated on the given logical link. | |
| Default value | True | |
| Availability | X dxge , ax dsxge | |

| | |
|----------------|---|
| Notes | - |
| Error behavior | - |

12.4.10 Gev Current IP Configuration DHCP

| | | |
|---------------------------|---|----------|
| Name | GevCurrentIPConfigurationDHCP[GevInterfaceSelector] | Standard |
| Description | Indicates if DHCP IP configuration scheme is activated on the given network interface. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – DHCP IP configuration scheme is activated on the given logical link. False – DHCP IP configuration scheme is not activated on the given logical link. | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.11 Gev Current IP Configuration Persistent IP

| | | |
|---------------------------|---|----------|
| Name | GevCurrentIPConfigurationPersistentIP[GevInterfaceSelector] | Standard |
| Description | Indicates if PersistentIP configuration scheme is activated on the given network interface. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – PersistentIP configuration scheme is activated on the given logical link. False – PersistentIP configuration scheme is not activated on the given logical link. | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.12 Gev Current IP Address

| | | |
|---------------------------|---|----------|
| Name | GevCurrentIPAddress[GevInterfaceSelector] | Standard |
| Description | Reports the IP address for the given network interface. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.13 Gev Current Subnet Mask

| | | |
|---------------------------|--|----------|
| Name | GevCurrentSubnetMask[GevInterfaceSelector] | Standard |
| Description | Provides the subnet mask of the given interface. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |

| | |
|----------------|---|
| Default value | - |
| Availability | X dxge , ax dsxge |
| Notes | - |
| Error behavior | - |

12.4.14 Gev Current Default Gateway

| | | |
|---------------------------|---|----------|
| Name | GevCurrentDefaultGateway [GevInterfaceSelector] | Standard |
| Description | Indicates the default gateway IP address to be used on the given network interface. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.15 Gev First URL

| | | |
|---------------------------|---|----------|
| Name | GevFirstURL | Standard |
| Description | Indicates the first URL to the XML device description file. The First URL is used as the first choice by the application to retrieve the XML device description file. | |
| Interface | String | |
| String Length | 512 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Notes | This feature is deprecated. | |
| Error behavior | - | |

12.4.16 Gev Second URL

| | | |
|---------------------------|--|----------|
| Name | GevSecondURL | Standard |
| Description | Indicates the second URL to the XML device description file. This URL is an alternative if the application was unsuccessful to retrieve the device description file using the first URL. | |
| Interface | String | |
| String Length | 512 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Notes | This feature is deprecated. | |
| Error behavior | - | |

12.4.17 Gev Number of Interfaces – Deprecated

| | | |
|---------------------------|---|----------|
| Name | GevNumberOfInterfaces | Standard |
| Description | Indicates the number of physical network interfaces supported by this device. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | > 0 | |

| | |
|----------------|---|
| Default value | - |
| Notes | This feature is deprecated (See DeviceLinkSelector). |
| Error behavior | - |

12.4.18 **Gev Persistent IP Address**

| | | |
|---------------------------|--|-----------------|
| Name | GevPersistentIPAddress | Standard |
| Description | Indicates the Persistent IP address for this network interface. It is only used when the device boots with the Persistent IP configuration scheme. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.19 **Gev Persistent Subnet Mask**

| | | |
|---------------------------|--|-----------------|
| Name | GevPersistentSubnetMask | Standard |
| Description | Indicates the Persistent subnet mask associated with the Persistent IP address on this network interface. It is only used when the device boots with the Persistent IP configuration scheme. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.20 **Gev Persistent Default Gateway**

| | | |
|---------------------------|---|-----------------|
| Name | GevPersistentDefaultGateway | Standard |
| Description | Indicates the persistent default gateway for this network interface. It is only used if the device boots with the Persistent IP configuration scheme. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.21 **Gev Persistent IP Address**

| | | |
|---------------------------|--|-----------------|
| Name | GevPersistentIPAddress | Standard |
| Description | Indicates the Persistent IP address for this network interface. It is only used when the device boots with the Persistent IP configuration scheme. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |

| | |
|----------------|---|
| Default value | - |
| Availability | X dxge , ax dsxge |
| Notes | - |
| Error behavior | - |

12.4.22 **GevLinkSpeed**

| | | |
|---------------------------|--|-----------------|
| Name | GevLinkSpeed | Standard |
| Description | Indicates the speed of transmission negotiated by the given network interface. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | >0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | The unit is Mbs. | |
| Error behavior | - | |

12.4.23 **Gev Message Channel Count**

| | | |
|---------------------------|--|-----------------|
| Name | GevMessageChannelCount | Standard |
| Description | Indicates the number of message channels supported by this device. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |
| Default value | - | |
| Notes | This feature is deprecated (See DeviceEventChannelCount). | |
| Error behavior | - | |

12.4.24 **Gev Stream Channel Count**

| | | |
|---------------------------|--|-----------------|
| Name | GevStreamChannelCount | Standard |
| Description | Indicates the number of stream channels supported by this device. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |
| Default value | - | |
| Notes | This feature is deprecated (See Device Stream Channel Count). | |
| Error behavior | - | |

12.4.25 **Gev Heartbeat Timeout**

| | | |
|---------------------------|--|-----------------|
| Name | GevHeartbeatTimeout | Standard |
| Description | Indicates the current heartbeat timeout in milliseconds. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥500 | |
| Default value | - | |
| Notes | This feature is deprecated (See Device Link Heartbeat Timeout). | |
| Error behavior | - | |

12.4.26 Gev Timestamp Tick Frequency

| | | |
|---------------------------|--|-----------------|
| Name | GevTimestampTickFrequency | Standard |
| Description | Indicates the number of timestamp ticks during 1 second (frequency in Hz). | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Notes | This feature is deprecated (See increment of the Timestamp Latch Value feature). | |
| Error behavior | - | |

12.4.27 Gev Timestamp Control Latch

| | | |
|---------------------------|--|-----------------|
| Name | GevTimestampControlLatch | Standard |
| Description | Latches current timestamp counter into GevTimestampValue . | |
| Interface | Command | |
| Access mode | Write only | |
| Adjustable while grabbing | Yes | |
| Value range | 1 | |
| Default value | 1 | |
| Notes | This feature is deprecated (See Timestamp Latch). | |
| Error behavior | - | |

12.4.28 Gev Timestamp Control Reset

| | | |
|---------------------------|--|-----------------|
| Name | GevTimestampControlReset | Standard |
| Description | Resets the Timestamp counter to 0. | |
| Interface | Command | |
| Access mode | Write only | |
| Adjustable while grabbing | Yes | |
| Value range | 1 | |
| Default value | 1 | |
| Notes | This feature is deprecated (See Timestamp Reset). | |
| Error behavior | - | |

12.4.29 Gev Time stamp Value

| | | |
|---------------------------|--|-----------------|
| Name | GevTimestampValue | Standard |
| Description | Returns the latched 64-bit value of the timestamp counter. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Notes | This feature is deprecated (See Timestamp Latch Value). | |
| Error behavior | - | |

12.4.30 Gev CCP

| | | |
|---------------------------|---|-----------------|
| Name | GevCCP | Standard |
| Description | Controls the device access privilege of an application. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

Gev CCP Enum Entries:

| Name | Description |
|-----------------|------------------|
| OpenAccess | Open access |
| ExclusiveAccess | Exclusive access |
| ControlAccess | Control access |

12.4.31 Gev MCPHost Port

| | | |
|---------------------------|--|-----------------|
| Name | GevMCPHostPort | Standard |
| Description | Indicates the port to which the device must send messages. Setting this value to 0 closes the message channel. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.32 Gev MCDA

| | | |
|---------------------------|---|-----------------|
| Name | GevMCDA | Standard |
| Description | Indicates the destination IP address for the message channel. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.33 Gev MCTT

| | | |
|---------------------------|--|-----------------|
| Name | GevMCTT | Standard |
| Description | Provides the transmission timeout value in milliseconds. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | 0 | |
| Availability | X dxge , ax dsxge | |

| | |
|----------------|---|
| Notes | - |
| Error behavior | - |

12.4.34 **Gev MCRC**

| | | |
|---------------------------|---|-----------------|
| Name | GevMCRC | Standard |
| Description | Indicates the number of retransmissions allowed if a message channel message times out. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥ 0 | |
| Default value | 0 | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.35 **Gev MCSP**

| | | |
|---------------------------|---|-----------------|
| Name | GevMCSP | Standard |
| Description | This feature indicates the source port for the message channel. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.36 **Gev Stream Channel Selector**

| | | |
|---------------------------|---|-----------------|
| Name | GevStreamChannelSelector | Standard |
| Description | Selects the stream channel to control. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥ 0 | |
| Default value | 0 | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.37 **Gev SCP Interface Index**

| | | |
|---------------------------|--|-----------------|
| Name | GevSCPInterfaceIndex[GevStreamChannelSelector] | Standard |
| Description | Index of network interface to use. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | 0 | |
| Default value | 0 | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.38 Gev SCPHost Port

| | | |
|---------------------------|--|----------|
| Name | GevSCPHostPort[GevStreamChannelSelector] | Standard |
| Description | Indicates the port to which the device must send data stream. Setting this value to 0 closes the stream channel. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.39 Gev SCPSFire Test Packet

| | | |
|---------------------------|---|----------|
| Name | GevSCPSFireTestPacket[GevStreamChannelSelector] | Standard |
| Description | Sends a test packet. If this feature is set, the device fires one test packet. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – The device will fire one test packet. False – The device will not send a test packet. | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.40 Gev SCPSTo Not Fragment

| | | |
|---------------------------|--|----------|
| Name | GevSCPSToNotFragment[GevStreamChannelSelector] | Standard |
| Description | The state of this feature is copied into the “do not fragment” bit of IP header of each stream packet. It can be used by the application to prevent IP fragmentation of packets on the stream channel. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True False | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.41 Gev SCPSBig Endian

| | | |
|---------------------------|---|----------|
| Name | GevSCPSBigEndian | Standard |
| Description | Endianess of multi-byte pixel data for this stream. | |
| Interface | Boolean | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | True False | |
| Default value | - | |
| Notes | This feature is deprecated (See Device Stream Channel Endianness). | |
| Error behavior | - | |

12.4.42 Gev SCPSPacket Size

| | | |
|---------------------------|--|-----------------|
| Name | GevSCPSPacketSize[GevStreamChannelSelector] | Standard |
| Description | Specifies the stream packet size in bytes to send on this channel. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | >0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.43 Gev SCPD

| | | |
|---------------------------|--|-----------------|
| Name | GevSCPD[GevStreamChannelSelector] | Standard |
| Description | Indicates the delay (in timestamp counter unit) to insert between each packet for this stream channel. This can be used as a crude flow-control mechanism if the application or the network infrastructure cannot keep up with the packets coming from the device. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.4.44 Gev SCDA

| | | |
|---------------------------|---|-----------------|
| Name | GevSCDA[GevStreamChannelSelector] | Standard |
| Description | Indicates the destination IP address for this stream channel. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X dxge , ax dsxge | |
| Notes | - | |
| Error behavior | - | |

12.5 CoaXPress

12.5.1 Cxp Link Configuration Preferred

| | | |
|---------------------------|---|----------|
| Name | CxpLinkConfigurationPreferred | Standard |
| Description | This feature provides the default link configuration. | |
| Interface | Enumeration | |
| Access mode | Read Only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries below. | |
| Default value | - | |
| Availability | X_cxp | |
| Notes | - | |
| Error behavior | - | |

Cxp Link Configuration Preferred Enum Entries:

| Name | Description |
|----------|---|
| CXP1_X1 | Force the Link to 1 Connections operating at CXP-1 speed (1.250 Gbps) |
| CXP1_X2 | Force the Link to 2 Connections operating at CXP-1 speed (1.250 Gbps) |
| CXP1_X3 | Force the Link to 3 Connections operating at CXP-1 speed (1.250 Gbps) |
| CXP1_X4 | Force the Link to 4 Connections operating at CXP-1 speed (1.250 Gbps) |
| CXP2_X1 | Force the Link to 1 Connections operating at CXP-2 speed (2.500 Gbps) |
| CXP2_X2 | Force the Link to 2 Connections operating at CXP-2 speed (2.500 Gbps) |
| CXP2_X3 | Force the Link to 3 Connections operating at CXP-2 speed (2.500 Gbps) |
| CXP2_X4 | Force the Link to 4 Connections operating at CXP-2 speed (2.500 Gbps) |
| CXP3_X1 | Force the Link to 1 Connections operating at CXP-3 speed (3.125 Gbps) |
| CXP3_X2 | Force the Link to 2 Connections operating at CXP-3 speed (3.125 Gbps) |
| CXP3_X3 | Force the Link to 3 Connections operating at CXP-3 speed (3.125 Gbps) |
| CXP3_X4 | Force the Link to 4 Connections operating at CXP-3 speed (3.125 Gbps) |
| CXP5_X1 | Force the Link to 1 Connections operating at CXP-5 speed (5.000 Gbps) |
| CXP5_X2 | Force the Link to 2 Connections operating at CXP-5 speed (5.000 Gbps) |
| CXP5_X3 | Force the Link to 3 Connections operating at CXP-5 speed (5.000 Gbps) |
| CXP5_X4 | Force the Link to 4 Connections operating at CXP-5 speed (5.000 Gbps) |
| CXP6_X1 | Force the Link to 1 Connections operating at CXP-6 speed (6.250 Gbps) |
| CXP6_X2 | Force the Link to 2 Connections operating at CXP-6 speed (6.250 Gbps) |
| CXP6_X3 | Force the Link to 3 Connections operating at CXP-6 speed (6.250 Gbps) |
| CXP6_X4 | Force the Link to 4 Connections operating at CXP-6 speed (6.250 Gbps) |
| CXP10_X1 | Force the Link to 1 Connections operating at CXP-10 speed (10.000 Gbps) |

| | |
|----------|---|
| CXP10_X2 | Force the Link to 2 Connections operating at CXP-10 speed (10.000 Gbps) |
| CXP10_X3 | Force the Link to 3 Connections operating at CXP-10 speed (10.000 Gbps) |
| CXP10_X4 | Force the Link to 4 Connections operating at CXP-10 speed (10.000 Gbps) |

12.5.2 Cxp Link Configuration

| Name | CxpLinkConfiguration | Standard |
|---------------------------|--|----------|
| Description | This feature allows specifying the Link configuration for the communication between the Receiver and Transmitter Device. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | See enum entries below. | |
| Default value | - | |
| Availability | X_cxp | |
| Notes | - | |
| Error behavior | - | |

Cxp Link Configuration Enum Entries:

| Name | Description |
|---------|---|
| CXP1_X1 | Force the Link to 1 Connections operating at CXP-1 speed (1.250 Gbps) |
| CXP1_X2 | Force the Link to 2 Connections operating at CXP-1 speed (1.250 Gbps) |
| CXP1_X3 | Force the Link to 3 Connections operating at CXP-1 speed (1.250 Gbps) |
| CXP1_X4 | Force the Link to 4 Connections operating at CXP-1 speed (1.250 Gbps) |
| CXP2_X1 | Force the Link to 1 Connections operating at CXP-2 speed (2.500 Gbps) |
| CXP2_X2 | Force the Link to 2 Connections operating at CXP-2 speed (2.500 Gbps) |
| CXP2_X3 | Force the Link to 3 Connections operating at CXP-2 speed (2.500 Gbps) |
| CXP2_X4 | Force the Link to 4 Connections operating at CXP-2 speed (2.500 Gbps) |
| CXP3_X1 | Force the Link to 1 Connections operating at CXP-3 speed (3.125 Gbps) |
| CXP3_X2 | Force the Link to 2 Connections operating at CXP-3 speed (3.125 Gbps) |
| CXP3_X3 | Force the Link to 3 Connections operating at CXP-3 speed (3.125 Gbps) |
| CXP3_X4 | Force the Link to 4 Connections operating at CXP-3 speed (3.125 Gbps) |
| CXP5_X1 | Force the Link to 1 Connections operating at CXP-5 speed (5.000 Gbps) |
| CXP5_X2 | Force the Link to 2 Connections operating at CXP-5 speed (5.000 Gbps) |
| CXP5_X3 | Force the Link to 3 Connections operating at CXP-5 speed (5.000 Gbps) |
| CXP5_X4 | Force the Link to 4 Connections operating at CXP-5 speed (5.000 Gbps) |
| CXP6_X1 | Force the Link to 1 Connections operating at CXP-6 speed (6.250 Gbps) |
| CXP6_X2 | Force the Link to 2 Connections operating at CXP-6 speed (6.250 Gbps) |

| | |
|----------|---|
| CXP6_X3 | Force the Link to 3 Connections operating at CXP-6 speed (6.250 Gbps) |
| CXP6_X4 | Force the Link to 4 Connections operating at CXP-6 speed (6.250 Gbps) |
| CXP10_X1 | Force the Link to 1 Connections operating at CXP-10 speed (10.000 Gbps) |
| CXP10_X2 | Force the Link to 2 Connections operating at CXP-10 speed (10.000 Gbps) |
| CXP10_X3 | Force the Link to 3 Connections operating at CXP-10 speed (10.000 Gbps) |
| CXP10_X4 | Force the Link to 4 Connections operating at CXP-10 speed (10.000 Gbps) |

12.5.3 Cxp Version Used

| | | |
|---------------------------|--|---------------|
| Name | CxpVersionUsed | Custom |
| Description | Version of the CoaXPress specification used for communication between Device and Host. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Availability | X_cxp | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Cxp Version Used Enum Entries:

| Name | Description |
|-----------------|-----------------|
| CXP_Version_1_1 | Cxp Version 1.1 |
| CXP_Version_2_0 | Cxp Version 2.0 |

12.5.4 Cxp Connection Selector

| | | |
|---------------------------|---|-----------------|
| Name | CxpConnectionSelector | Standard |
| Description | Selects the coaxpress physical connection to control. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | - | |
| Availability | X_cxp | |
| Notes | - | |
| Error behavior | - | |

12.5.5 Cxp Connection Test Mode

| | | |
|---------------------------|--|-----------------|
| Name | CxpConnectionTestMode[CxpConnectionSelector] | Standard |
| Description | Enables the test mode for an individual physical connection of the device. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | See enum entries below. | |
| Default value | Off | |
| Availability | X_cxp | |
| Notes | - | |
| Error behavior | - | |

Cxp Connection Test Mode Enum Entries:

| Name | Description |
|-------|--------------------|
| Off | Test mode disabled |
| Mode1 | Test mode enabled |

12.5.6 Cxp Connection Test Packet Count Tx

| Name | CxpConnectionTestPacketCountTx[CxpConnectionSelector] | Custom |
|---------------------------|--|--------|
| Description | Reports the current count for the test packets sent on selected physical connection. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | X_cxp | |
| Notes | - | |
| Error behavior | - | |

12.5.7 Cxp Connection Test Packet Count Rx

| Name | CxpConnectionTestPacketCountRx[CxpConnectionSelector] | Custom |
|---------------------------|--|--------|
| Description | Reports the current count for the test packets received on selected physical connection. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | X_cxp | |
| Notes | - | |
| Error behavior | - | |

12.5.8 Cxp Connection Test Error Count

| Name | CxpConnectionTestErrorCount[CxpConnectionSelector] | Standard |
|---------------------------|---|----------|
| Description | Reads the current connection error count for the test packets received by the device on the selected connector. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | ≥ 0 | |
| Default value | - | |
| Availability | X_cxp | |
| Notes | - | |
| Error behavior | - | |

13 File Access Control

In general, make sure to always use consistent packages as delivered by Chromasens and do not mix files from different packages!

13.1 File Selector

| | | |
|---------------------------|--|----------|
| Name | FileSelector | Standard |
| Description | Select a file to read/write. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | NoFile | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

File Selector Enum Entries:

| Name | Description |
|------------------------|---|
| NoFile | No file selected |
| Bitstream | Enables bitstream access |
| Application | Enables application access |
| Xml | Enables GenICam XML access |
| DSNULUT1 | Enables DSNU LUT 1 access ¹ |
| DSNULUT2 | Enables DSNU LUT 2 access ¹ |
| PRNULUT1 | Enables PRNU LUT 1 access ¹ |
| PRNULUT2 | Enables PRNU LUT 2 access ¹ |
| SensorFile | Enables Sensor File access |
| GammaLUT | Enables Gamma LUT access |
| UserSet1 | Enables User set 1 access |
| UserSet2 | Enables User set 2 access |
| UserSet3 | Enables User set 3 access |
| UserSet4 | Enables User set 4 access |
| UserSet5 | Enables User set 5 access |
| UserSet6 | Enables User set 6 access |
| UserSet7 | Enables User set 7 access |
| UserSet8 | Enables User set 8 access |
| LightCtrlSet1 | Enables Light controller set 1 access (Not for allPIXA Evo) |
| PackageDescriptionFile | Enables Package Description File access |

¹ If the LUT is enabled in the image processing unit, it will be updated with the newly downloaded file.

13.2 File Operation Selector

| | | |
|---------------------------|--|----------|
| Name | FileOperationSelector[FileSelector] | Standard |
| Description | Select an operation which shall be performed on a file. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | NoOperation | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

File Operation Selector Enum Entries:

| Name | Description | Notes |
|-------------|----------------------|--|
| NoOperation | Selects no operation | - |
| Open | Open a file | Fails if a file is already opened. |
| Close | Close a file | <p>When this command is executed, the file is verified and internally copied. This is a time-consuming process.</p> <p>A file is always closed, even if an error occurs.</p> <p>The File Operation Status is set appropriately. Therefore Success indicates a successful file update and Failure an erroneous update.</p> <p>If a Fatal Error occurs, the File Operation Status is set to Fatal Error. In this case you must not switch off the camera if the file type is one of the following:</p> <ul style="list-style-type: none"> - Bitstream - Application - XML - Bootfile (sensorfile) <p>For these files, please try to download the file again to avoid damage!</p> <p>For other files you may switch off the camera.</p> <p><i>In general, make sure to always use consistent packages as delivered by chromasens and do not mix files from different packages!</i></p> |
| Read | Read a file | - |
| Write | Write a file | - |

13.3 File Operation Execute

| Name | FileOperationExecute[FileOperationSelector] | Standard |
|---------------------------|---|----------|
| Description | Executes the selected file operation. | |
| Interface | Command | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | {0,1} | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | To check whether the operation is finished, read the value of the FileOperationExecute command periodically. If the value is not equal to the commands value of the node in the xml, the command has finished execution. | |
| Error behavior | See the device error code documentation. | |

13.4 File Open Mode

| Name | FileOpenMode | Standard |
|---------------------------|--|----------|
| Description | Select an open mode. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | NoOpenMode | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

File Open Mode Enum Entries:

| Name | Description | Notes |
|------------|--------------------------------|---|
| NoOpenMode | No open mode selected | - |
| Read | Open a file in read-only mode | - |
| Write | Open a file in write-only mode | With this open mode no read command is permitted. In addition, if the FileAccessOffset is set after a write command occurred, the new value of the FileAccessOffset must be at least new_ FileAccessOffset = (old_ FileAccessOffset + old_ FileAccessLength). |

13.5 File Access Offset

| Name | FileAccessOffset[FileOperationSelector] | Standard |
|---------------------------|--|----------|
| Description | Controls the starting position of the access in the file. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥0 | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | The unit is Byte. Please see Write for restrictions. | |
| Error behavior | See the device error code documentation. | |

13.6 File Access Length

| Name | FileAccessLength[FileOperationSelector] | Standard |
|---------------------------|--|----------|
| Description | Controls the length of the mapping between the device file storage and the FileAccessBuffer. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥ 0 | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | The unit is Byte. Please see Write for restrictions. | |
| Error behavior | See the device error code documentation. | |

13.7 File Operation Result

| Name | FileOperationResult[FileOperationSelector] | Standard |
|---------------------------|---|----------|
| Description | The number of the successfully read/written bytes of the last file operation. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

13.8 File Operation Status

| Name | FileOperationStatus[FileOperationSelector] | Standard |
|---------------------------|--|----------|
| Description | Status of recent operation. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | Success | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

File Operation Status Enum Entries:

| Name | Description | Notes |
|------------|---|--|
| Success | The last operation succeeded | - |
| Failure | The last operation failed | - |
| FatalError | If this error occurs, do not switch off the device and repeat the update immediately! Otherwise, the system may refuse to boot next time! | A fatal error occurred during the last operation. Please see the Close command for more information. |

13.9 File Size

| | | |
|---------------------------|--|----------|
| Name | FileSize[FileSelector] | Standard |
| Description | Represents the size of the selected file in bytes. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

13.10 File Checksum

| | | |
|---------------------------|---|--------|
| Name | FileChecksum[FileSelector] | Custom |
| Description | The checksum of a file. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | ≥ 0 | |
| Default value | 0 | |
| Availability | ALL | |
| Notes | <p>This feature must be set by the user after the file is opened and before the file is closed if a file is uploaded to the camera. Only if the checksum feature corresponds to the checksum calculated internally by the camera, the file download succeeds. For reading operations there is no need to set the checksum feature.</p> <p>Calculation: The checksum is an unsigned 32-bit value. It is the sum of all 4-Byte words (Little Endian) of the file. If a files size is not a multiple of four, the “missing” bytes are interpreted as zero.</p> <p><i>Pseudo code for calculation:</i> <pre> u32 file[N] u32 checksum = 0 checksum += file[0] checksum += file[1] ... checksum += file[N-1] </pre> </p> | |
| Error behavior | See the device error code documentation. | |

13.11 File Access Buffer

| | | |
|---------------------------|--|----------|
| Name | FileAccessBuffer | Standard |
| Description | This buffer is used for the GenICam file update mechanism. | |
| Interface | Register | |
| Size | 65536 | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | - | |
| Availability | ALL | |
| Default value | - | |
| Notes | See the device error code documentation. | |

14 Digital IO Control

14.1 Line Selector

| | | |
|---------------------------|--|----------|
| Name | LineSelector | Standard |
| Description | Selects the physical line (or pin) of the external device connector. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Line1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Line Selector Enum Entries:

| Name | Description |
|------------|---|
| Line1 | Selects Line 1 |
| Line2 | Selects Line 2 |
| Line3 | Selects Line 3 |
| Line4 | Selects Line 4 |
| Line5 | Selects Line 5 |
| Line6 | Selects Line 6 |
| Line7 | Selects Line 7 |
| Line8 | Selects Line 8 |
| Line9 | Selects Line 9 |
| IntLine1 | Selects IntLine 1. Currently not implemented |
| InternalLB | Selects InternalLB. Currently not implemented |

14.2 Line Mode

| | | |
|---------------------------|---|----------|
| Name | LineMode[LineSelector] | Standard |
| Description | Controls whether the physical line is used to input or output a signal. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Input | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Line Mode Enum Entries:

| Name | Description |
|--------|---|
| Input | The selected physical line is used to Input an electrical signal |
| Output | The selected physical line is used to Output an electrical signal – (Currently not available) |

14.3 Line Inverter

| | | |
|---------------------------|---|----------|
| Name | LineInverter[LineSelector] | Standard |
| Description | Controls the inversion of the signal of the selected input or output Line. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | True – The Line signal is inverted False – The Line signal is not inverted | |
| Default value | False | |
| Availability | ALL | |

| | |
|----------------|--|
| Notes | - |
| Error behavior | See the device error code documentation. |

14.4 Line Status

| | | |
|---------------------------|--|----------|
| Name | LineStatus[LineSelector] | Standard |
| Description | Returns the current status of the selected input or output Line. | |
| Interface | Boolean | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | True – The level of the Line signal is High False – The level of the Line signal is low | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | - | |

14.5 Line Source

| | | |
|---------------------------|--|----------|
| Name | LineSource[LineSelector] | Standard |
| Description | Selects which internal acquisition or I/O source signal to output on the selected Line. LineMode must be output. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Off | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Line Source Enum Entries:

| Name | Description |
|------|-------------------------|
| Off | Line output is disabled |

15 Encoder Control

15.1 Encoder Selector

| | | |
|---------------------------|--|----------|
| Name | EncoderSelector | Standard |
| Description | Selects which Encoder to configure. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Encoder0 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Encoder Selector Enum Entries:

| Name | Description |
|----------|------------------|
| Encoder0 | Selects Encoder0 |

15.2 Encoder Source A

| | | |
|---------------------------|--|----------|
| Name | EncoderSourceA[EncoderSelector] | Standard |
| Description | Selects the signal which will be the source of the input A of the encoder. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | Off | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Encoder Source A Enum Entries:

| Name | Description |
|-------|---|
| Off | Encoder does not forward any input |
| Line1 | Encoder forward input is taken from the I/O Line1 |
| Line3 | Encoder forward input is taken from the I/O Line3 |
| Line4 | Encoder forward input is taken from the I/O Line4 |

15.3 Encoder Source B

| | | |
|---------------------------|--|----------|
| Name | EncoderSourceB[EncoderSelector] | Standard |
| Description | Selects the signal which will be the source of the input B of the encoder. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | Off | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Encoder Source B Enum Entries:

| Name | Description |
|-------|---|
| Off | Encoder does not forward any input |
| Line2 | Encoder forward input is taken from the I/O Line2 |

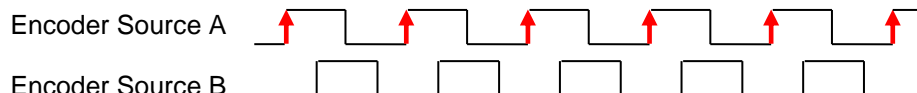
15.4 Encoder Mode

| | | |
|---------------------------|---|----------|
| Name | EncoderMode[EncoderSelector] | Standard |
| Description | Selects whether the count of encoder uses FourPhase mode or the HighResolution mode. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Default value | FourPhase | |
| Availability | ALL | |
| Notes | <p>A jitter filter is applied to the encoder sources for all encoder modes. To achieve higher jitter filtering use Encoder Average feature.</p> <p>The scan direction detection is based on Encoder Source B and independent of the encoder mode.</p> | |
| Error behavior | See the device error code documentation. | |

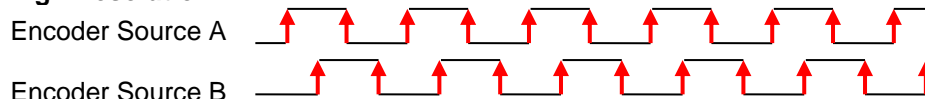
Encoder Mode Enum Entries:

| Name | Description |
|----------------|---|
| FourPhase | <p>The counter increments or decrements 1 for every full quadrature cycle.</p> <p><i>The chromasens FourPhase mode is deviating from standard because the state machine defined by SFNC is not implemented.</i></p> |
| HighResolution | <p>The counter increments or decrements every quadrature phase for high resolution counting.</p> <p><i>This mode is not recommended due to jitter of the encoder.</i></p> |

Four Phase



High Resolution



15.5 Encoder Output Mode

| | | |
|---------------------------|---|-----------------|
| Name | EncoderOutputMode[EncoderSelector] | Standard |
| Description | Selects the conditions for the encoder interface to generate a valid encoder output signal. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Motion | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Encoder Output Mode Enum Entries:

| Name | Description |
|--------|--|
| Motion | Output pulses are generated at all motion increments in both directions. |

15.6 Encoder Divider Float

| | | |
|---------------------------|--|---------------|
| Name | EncoderDividerFloat[EncoderSelector] | Custom |
| Description | Specifies the number of encoder steps needed to generate an encoder output pulse | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | [0.02 , 255.999] | |
| Default value | 1.0 | |
| Availability | ALL | |
| Notes | This is the minimum divider value working in combination with other factors! | |
| Error behavior | See the device error code documentation. | |

15.7 Encoder Average

| | | |
|---------------------------|--|---------------|
| Name | EncoderAverage[EncoderSelector] | Custom |
| Description | Specifies the number of averaged encoder input pulses. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | Average1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Encoder Output Mode Enum Entries:

| Name | Description |
|-----------|-----------------------|
| Average1 | No averaged performed |
| Average2 | Average 2 |
| Average4 | Average 4 |
| Average8 | Average 8 |
| Average16 | Average 16 |

16 Led Flash Control

16.1 Led Flash Enable

| | | |
|---------------------------|---|--------|
| Name | LedFlashEnable | Custom |
| Description | Enables Led flashing feature to support LED drivers with strobe signals for flashing | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | True – Led flash is enabled False – Led flash is disabled | |
| Default value | False | |
| Availability | ALL | |
| Notes | In case of using LED-Flashing with Master Slave Mode the Led Flash Enable should not be set for the slave camera. Required LED-Flashing parameters will be transferred by the master slave interface. | |
| Error behavior | See the device error code documentation. | |

16.2 Led Flash Number of Pattern

| | | |
|---------------------------|--|--------|
| Name | LedFlashNumberOfPattern | Custom |
| Description | Number of Led Flash pattern per flashing sequence | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | [1 , 4] | |
| Default value | 1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

16.3 Led Flash Pattern Selector

| | | |
|---------------------------|--|--------|
| Name | LedFlashPatternSelector | Custom |
| Description | Selects which Led Flash Pattern to configure | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | Yes | |
| Value range | See enum entries table below. | |
| Default value | LedFlashPattern1 | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Led Flash Pattern Selector Enum Entries:

| Name | Description |
|------------------|---------------------|
| LedFlashPattern1 | Led Flash Pattern 1 |
| LedFlashPattern2 | Led Flash Pattern 2 |
| LedFlashPattern3 | Led Flash Pattern 3 |
| LedFlashPattern4 | Led Flash Pattern 4 |

16.4 Out1 OnTime

| | | | |
|---------------------------|--|----------------|--------|
| Name | LedFlashOut1OnTime [LedFlashPatternSelector] | | Custom |
| Description | This controls the On time for Flash Output 1 | | |
| Interface | Float | | |
| Access mode | Read/Write | | |
| Adjustable while grabbing | No | | |
| Value range | Variant | Value Range | |
| | ax_X | [0.0, 3495.04] | |
| | g8_X | [0.0, 3276.60] | |
| Default value | 0.0 | | |
| Availability | ALL | | |
| Notes | - | | |
| Error behavior | See the device error code documentation. | | |

16.5 Out2 OnTime

| | | | |
|---------------------------|--|----------------|--------|
| Name | LedFlashOut2OnTime[LedFlashPatternSelector] | | Custom |
| Description | This controls the On time for Flash Output 2 | | |
| Interface | Float | | |
| Access mode | Read/Write | | |
| Adjustable while grabbing | No | | |
| Value range | Variant | Value Range | |
| | ax_X | [0.0, 3495.04] | |
| | g8_X | [0.0, 3276.60] | |
| Default value | 0.0 | | |
| Availability | ALL | | |
| Notes | - | | |
| Error behavior | See the device error code documentation. | | |

16.6 Out3 OnTime

| | | | |
|---------------------------|--|----------------|--------|
| Name | LedFlashOut3OnTime[LedFlashPatternSelector] | | Custom |
| Description | This controls the On time for Flash Output 3 | | |
| Interface | Float | | |
| Access mode | Read/Write | | |
| Adjustable while grabbing | No | | |
| Value range | Variant | Value Range | |
| | ax_X | [0.0, 3495.04] | |
| | g8_X | [0.0, 3276.60] | |
| Default value | 0.0 | | |
| Availability | ALL | | |
| Notes | - | | |
| Error behavior | See the device error code documentation. | | |

16.7 Out4 OnTime

| | | | |
|---------------------------|--|----------------|--------|
| Name | LedFlashOut4OnTime [LedFlashPatternSelector] | | Custom |
| Description | This controls the On time for Flash Output 4 | | |
| Interface | Float | | |
| Access mode | Read/Write | | |
| Adjustable while grabbing | No | | |
| Value range | Variant | Value Range | |
| | ax_X | [0.0, 3495.04] | |
| | g8_X | [0.0, 3276.60] | |
| Default value | 0.0 | | |
| Availability | ALL | | |
| Notes | - | | |
| Error behavior | See the device error code documentation. | | |

16.8 Pattern Off Delay

| | | | |
|---------------------------|---|----------------------------------|--------|
| Name | LedFlashPatternOffDelay[LedFlashPatternSelector] | | Custom |
| Description | This increases the duration of the specified pattern | | |
| Interface | Float | | |
| Access mode | Read/Write | | |
| Adjustable while grabbing | No | | |
| Value range | Variant | Value Range | |
| | ax_X | [0.0, (3495.04 – MaxOutXOnTime)] | |
| | g8_X | [0.0, (3276.60 – MaxOutXOnTime)] | |
| | MaxOutXOnTime is the maximum of the flash out on time of the specified pattern. | | |
| Default value | 0.0 | | |
| Availability | ALL | | |
| Notes | - | | |
| Error behavior | See the device error code documentation. | | |

16.9 Pattern duration

| | | | |
|---------------------------|---|--|--------|
| Name | LedFlashPatternDuration[LedFlashPatternSelector] | | Custom |
| Description | This is the resulting duration of the specified pattern | | |
| Interface | Float | | |
| Access mode | Read Only | | |
| Adjustable while grabbing | - | | |
| Value range | The value depends on the minimum line time and on the maximum flash out on time of the specified pattern. | | |
| Default value | - | | |
| Availability | ALL | | |
| Notes | - | | |
| Error behavior | - | | |

16.10 Led Flash Frame Control

| | | |
|---------------------------|--|--------|
| Name | LedFlashFrameControl | Custom |
| Description | Determine if Led flash signals are generated continuously or only while image scan | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | See enum entries table below. | |
| Availability | ALL | |
| Default value | Continuous | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

Led Flash Frame Control Enum Entries:

| Name | Description |
|------------|---|
| Continuous | Flash pulses are generated continuously |
| ImageFrame | Flash pulses are generated only during image scan |

16.11 Led Flash Sequence Time

| | | |
|---------------------------|---|--|
| Name | LedFlashSequenceTime | Custom |
| Description | This is the time to repeat all defined pattern in free-run mode. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | No | |
| Value range | Variant | Value Range |
| | ax_X | $[(\text{MinLineTime} * \text{NoOfPattern}), 13980.8]$ |
| | g8_X | $[(\text{MinLineTime} * \text{NoOfPattern}), 13107.0]$ |
| | The minimum value depends on different factors like minimum line time of the system together with number of patterns. | |
| Default value | - | |
| Availability | ALL | |
| Notes | - | |
| Error behavior | See the device error code documentation. | |

17 Lighting Control – Not Available for AllPIXA-EVO

17.1 Light Controller Set Load

| | | |
|---------------------------|--|--------|
| Name | LightControllerSetLoad | Custom |
| Description | Loads the Light Controller Set to the device and activates it. | |
| Interface | Command | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | 1 | |
| Default value | 1 | |
| Notes | - | |
| Error behavior | - | |

17.2 Light Controller Set Save

| | | |
|---------------------------|---|--------|
| Name | LightControllerSetSave | Custom |
| Description | Save the Light Controller Set to the non-volatile memory of the device. | |
| Interface | Command | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | 1 | |
| Default value | 1 | |
| Notes | - | |
| Error behavior | - | |

17.3 Light Controller Scan Devices

| | | |
|---------------------------|---------------------------|--------|
| Name | LightControlScanDevices | Custom |
| Description | Performs a scan for XLCs. | |
| Interface | Command | |
| Access mode | Write only | |
| Adjustable while grabbing | - | |
| Value range | 1 | |
| Default value | 1 | |
| Notes | - | |
| Error behavior | - | |

17.4 Light Controller Scan Status

| | | |
|---------------------------|--|--------|
| Name | LightControllerScanStatus | Custom |
| Description | Displays Light Controller scan status information. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

Light Controller Scan Status Enum Entries:

| Name | Description |
|----------------|------------------|
| NoScanExecuted | No scan executed |
| ScanInProgress | Scan in progress |
| ScanFinished | Scan finished |

17.5 Light Controller Detected Devices

| | | |
|---------------------------|---|--------|
| Name | LightControllerDetectedDevices | Custom |
| Description | The bit position represents the on/off state of the light controller. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | ≥ 0 | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

17.6 Light Controller General Error

| | | |
|---------------------------|--|--------|
| Name | LightControllerGeneralError | Custom |
| Description | Displays Light Controller General Error Information. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

Light Controller General Error Enum Entries:

| Name | Description |
|-----------------------------|---------------------------|
| No Error | NoError |
| Communication Not Enabled | CommunicationNotEnabled |
| No Device Available | NoDeviceAvailable |
| Device Not Available | DeviceNotAvailable |
| Invalid Controller Selector | InvalidControllerSelector |
| Invalid Channel Selector | InvalidChannelSelector |
| Link May Be Broken | LinkMayBeBroken |
| Invalid ID | InvalidID |
| ID Already Assigned | IDAlreadyAssigned |

17.7 Light Controller Selector

| | | |
|---------------------------|--|-----------------|
| Name | LightControllerSelector | Standard |
| Description | Selects the Light Controller to configure. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

Light Controller Selector Enum Entries:

| Name | Description |
|--------------------------|----------------------------|
| LightControllerBroadcast | Light Controller Broadcast |
| LightController2 | Light Controller 2 |
| LightController3 | Light Controller 3 |
| LightController4 | Light Controller 4 |
| LightController5 | Light Controller 5 |
| LightController6 | Light Controller 6 |
| LightController7 | Light Controller 7 |
| LightController8 | Light Controller 8 |
| LightController9 | Light Controller 9 |
| LightController10 | Light Controller 10 |
| LightController11 | Light Controller 11 |
| LightController12 | Light Controller 12 |
| LightController13 | Light Controller 13 |
| LightController14 | Light Controller 14 |
| LightController15 | Light Controller 15 |

17.8 Light Connection Status

| | | |
|---------------------------|--|----------|
| Name | LightConnectionStatus | Standard |
| Description | Status of a light connected to the controller's output line. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

Light Connection Status Enum Entries:

| Name | Description |
|---------------|----------------|
| Sensing | Sensing |
| Ready | Ready |
| NoConnect | No connect |
| ResponseError | Response error |
| Error | Error |

17.9 Light Controller Reset

| | | |
|---------------------------|--------------------------|--------|
| Name | LightControllerReset | Custom |
| Description | Resets the selected XLC. | |
| Interface | Command | |
| Access mode | Write only | |
| Adjustable while grabbing | - | |
| Value range | 1 | |
| Default value | 1 | |
| Notes | - | |
| Error behavior | - | |

17.10 Light Controller Assign ID

| | | |
|---------------------------|--|--------|
| Name | LightControllerAssignID | Custom |
| Description | Represents the current Light Controller ID and changes it if another one has been entered. | |
| Interface | Integer | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

17.11 Light Controller Input Voltage

| | | |
|---------------------------|--|--------|
| Name | LightControllerInputVoltage | Custom |
| Description | Displays the Light Controller input voltage. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Notes | The unit is mV. | |
| Error behavior | - | |

17.12 Light Controller Detailed Error Information

| | | |
|---------------------------|---|--------|
| Name | LightControllerDetailedErrorInformation | Custom |
| Description | Detailed error information about the selected light controller. | |
| Interface | Enumeration | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

Light Controller Detailed Error Enum Entries:

| Name | Description |
|-----------------------|--------------------------|
| NoError | No Error |
| InvalidCommando | Invalid Commando |
| InvalidParameter | Invalid Parameter |
| Parameter | Parameter |
| CommandNotSupported | Command Not Supported |
| InputVoltage | Input Voltage |
| AnalogVoltage | Analog Voltage |
| LedOutput | Led Output |
| FailNoSignal | Fail No Signal |
| TemperatureWarning | Temperature Warning |
| TemperatureError | Temperature Error |
| ShutdownSignal | Shutdown Signal |
| EepromWriteDriverUnit | EEPROM Write Driver Unit |
| EepromReadDriverUnit | EEPROM Read Driver Unit |
| EepromWriteLed | EEPROM Write LED |
| EepromReadLed | EEPROM Read LED |
| Fan | Fan |
| AnalogOutputVoltage | Analog Output Voltage |
| SeeGeneralError | See General Error |

17.13 Light Controller Serial Number

| | | |
|---------------------------|---------------------------------------|--------|
| Name | LightControllerSerialNumberReg | Custom |
| Description | Serial Number of the Light Controller | |
| Interface | String | |
| String Length | 32 | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

17.14 Light Controller Channel Selector

| | | |
|---------------------------|--|--------|
| Name | LightControllerChannelSelector | Custom |
| Description | Selects the Light Controller Channel to configure. | |
| Interface | Enumeration | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | See enum entries table below. | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

Light Controller Selector Enum Entries:

| Name | Description |
|---------------------------------|------------------------------------|
| LightControllerChannelA | Light Controller Channel A |
| LightControllerChannelB | Light Controller Channel B |
| LightControllerChannelC | Light Controller Channel C |
| LightControllerChannelD | Light Controller Channel D |
| LightControllerChannelBroadcast | Light Controller Channel Broadcast |

17.15Light Current Rating

| | | |
|---------------------------|--|----------|
| Name | LightCurrentRating | Standard |
| Description | Set the current rating of the lighting output. | |
| Interface | Float | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | ≥0 | |
| Default value | - | |
| Notes | The unit is Amp. | |
| Error behavior | - | |

17.16Light Enable

| | | |
|---------------------------|--|--------|
| Name | LightEnable | Custom |
| Description | Controls the light for the selected Lighting Controller. | |
| Interface | Boolean | |
| Access mode | Read/Write | |
| Adjustable while grabbing | - | |
| Value range | True – Enables the selected lighting controller False – Disables the selected lighting controller | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

17.17Light Controller Driver Temperature

| | | |
|---------------------------|-------------------------------------|--------|
| Name | LightControllerDriverTemperatureReg | Custom |
| Description | Light Controller Driver Temperature | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Notes | The unit is degrees Celsius. | |
| Error behavior | - | |

17.18Light Controller Luminant Temperature

| | | |
|---------------------------|---------------------------------------|--------|
| Name | LightControllerLuminantTemperatureReg | Custom |
| Description | Light Controller Luminant Temperature | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | - | |
| Default value | - | |
| Notes | The unit is degrees Celsius. | |
| Error behavior | - | |

18 Device Error Code

The Device error code is organized in two parts. The upper two bytes define a category. The lower two bytes define the specific error that occurred in this category.

Example

If the region of interest exceeds the sensor boundaries, the following error code is provided by the DeviceErrorCode:

0x00010003

The yellow part defines the category and the green part the specific error. Use the category error number to figure out, in which section you need to search for the specific error code.

So 0x0001 is the category code of the image format control (IMF_ERROR_CATEGORY) group. In this category the code 0x0003 defines the specific error code for the case when the region of interest exceeds the sensor boundaries.

18.1 Error Category (Upper 2 bytes)

This section contains an overview of the categories error codes. This is the upper part of the DeviceErrorCode.

| Definition | Value | Description |
|---|--------|--|
| IMF_ERROR_CATEGORY | 0x0001 | Image format control error category |
| ALG_CTRL_ERROR_CATEGORY | 0x0002 | Analog control error category |
| ACQ_CTRL_ERROR_CATEGORY | 0x0003 | Acquisition control error category |
| DIG_IO_CTRL_ERROR_CATEGORY | 0x0004 | Digital I/O control error category |
| ENC_CTRL_ERROR_CATEGORY | 0x0005 | Encoder control error category |
| USER_SET_CTRL_ERROR_CATEGORY | 0x0006 | User set control error category |
| ICC_ERROR_CATEGORY | 0x0007 | Image calibration control error category |
| LUT_CTRL_ERROR_CATEGORY | 0x0008 | Look-up table control error category |
| CT_CTRL_ERROR_CATEGORY | 0x0009 | Color transformation control error category. |
| DEV_CTRL_ERROR_CATEGORY | 0x000A | Device control error category |
| FAC_ERROR_CATEGORY | 0x000B | File access control error category |
| LED_FLASH_CTRL_ERROR_CATEGORY | 0x000C | Led flash control error category |

18.2 Specific Error (Lower 2 bytes)

This section contains the specific error codes (lower part of the DeviceErrorCode) grouped by the category. Check the [DeviceErrorMessage](#) feature to get a description of the error occurred.

18.2.1 Image Format Control (IMF_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the [IMF_ERROR_CATEGORY \(0x0001\)](#).

| Definition | Value | Description |
|---|--------|--|
| IMF_ERR_ROI_INVALID_WIDTH_OFFSET_MODULO | 0x0001 | The width or the offset is not a multiple of 8(RGB) or 24(Mono) |
| IMF_ERR_ROI_WIDTH_TOO_SMALL | 0x0002 | The region width is too small |
| IMF_ERR_ROI_EXCEEDS_SENSOR_BOUDARIES | 0x0003 | The region of interest exceeds the sensor boundaries. You need to use a smaller 110ffset or width. |
| IMF_ERR_WREF_IN_MULTIPLE_ROIS | 0x0004 | The complete gain control region is located in multiple regions. You need to use the gain control region only in one region |
| IMF_ERR_BV_MAX_LINE_WIDTH_EXCEEDED | 0x0005 | The sum of all active region widths and gain control region width (if not completely in one region) exceeds an internal limit of 15360 |
| IMF_ERR_FAILED_TO_SET_ROI_AT_SENSOR | 0x0006 | An internal error occurred while setting the region parameters |
| IMF_ERR_FAILED_TO_SET_ROI_AT_TRANSPORT_LAYER | 0x0007 | An internal error occurred while setting the region parameters |
| IMF_ERR_INVALID_BINNING_PARAMETER | 0x0008 | The binning parameter is not supported. You need to use either 1 or 2 for binning parameter |
| IMF_ERR_INVALID_PIXEL_FORMAT | 0x0009 | Invalid value for pixel format. You need to use a supported pixel format |
| IMF_ERR_COULD_NOT_ADJUST_ROI_WIDTH_TO_PXFMT | 0x000A | Could not adjust region width corresponding to pixel format. Increase the region width before changing the pixel format |
| IMF_ERR_COULD_NOT_ADJUST_WREF_OFFSET_WIDTH_TO_PXFMT | 0x000B | Could not adjust gain control region width or 110ffset corresponding to pixel format. Increase the gain control region width or 110ffset before changing the pixel format |
| IMF_ERR_INVALID_ROI_WIDTH_OFFSET_MODULO_PXFMT | 0x000C | Invalid region width or offsetX |
| IMF_ERR_INVALID_WREF_WIDTH_OFFSET_MODULO_PXFMT | 0x000D | Invalid gain control region width or offsetX |
| IMF_ERR_FAILED_TO_SET_PIXEL_FORMAT_AT_SENSOR | 0x000E | An internal error occurred while setting the pixel format |
| IMF_ERR_FAILED_TO_SET_PIXEL_FORMAT_AT_TRANSPORT_LAYER | 0x000F | An internal error occurred while setting the pixel format |
| IMF_ERR_TRIGGER_SLAVE_DELAY_LINES_OUT_OF_RANGE | 0x0010 | The trigger or slave delay lines value is out of range |
| IMF_ERR_IMAGE_HEIGHT_OUT_OF_RANGE | 0x0011 | The image height is out of range |
| IMF_ERR_TRG_SLAVE_DEL_GCTRL_OFFSET_Y_TOO_SMALL | 0x0012 | The trigger or slave delay lines value is too small with respect to gain control region offset. The sum of trigger delay lines and gain control region 110ffset must be atleast 2 |
| IMF_ERR_TRG_SLAVE_DEL_GCTRL_OFFSET_Y_TOO_LARGE | 0x0013 | The trigger or slave delay lines value is too large with respect to gain control region offset. The sum of trigger delay lines and gain control region 110ffset must be less than 32767 |
| IMF_ERR_TESTPATTERN_VALUE_OUT_OF_RANGE | 0x0014 | The test pattern value is out of range |
| IMF_ERR_INVALID_PARAMETER | 0x0015 | Invalid Parameter |

| | | |
|-------------------------------------|--------|--|
| IMF_ERR_DECIMATION_HOR_OUT_OF_RANGE | 0x0016 | The Decimation Horizontal Float value is out of range! |
|-------------------------------------|--------|--|

18.2.2 Analog Control (ALG_CTRL_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the [ALG_CTRL_ERROR_CATEGORY \(0x0002\)](#).

| Definition | Value | Description |
|---|--------|--|
| ALG_CTRL_ERR_GAINCTRL_OFFSET_Y_RANGE | 0x0001 | The gain control region 111ffset is out of range |
| ALG_CTRL_ERR_GAINCTRL_WIDTH_RANGE | 0x0002 | The gain control region width is out of range |
| ALG_CTRL_ERR_GAINCTRL_HEIGHT_RANGE | 0x0003 | The gain control region height is out of range |
| ALG_CTRL_ERR_GAINCTRL_EXCEEDS_SENSOR_BOUNDARIES | 0x0004 | The gain control region exceeds the sensor boundaries. You need to use a smaller 111ffset or width |
| ALG_CTRL_ERR_GAINCTRL_OFFSET_X_RANGE | 0x0005 | The gain control region 111ffset is out of range |
| ALG_CTRL_ERR_GAINCTRL_INVALID_WIDTH_OFFSET_MODULO | 0x0006 | The width or the offset is not a multiple of 8(RGB) or 24(Mono) |
| ALG_CTRL_ERR_GAINCTRL_EXCEEDS_BV_WIDTH_LIMIT | 0x0007 | The sum of all active region widths and gain control region width (if not completely in one region) exceeds an internal limit of 15360 |
| ALG_CTRL_ERR_GAINCTRL_IN_MULTIPLE_ROIS | 0x0008 | The complete gain control region is located in multiple regions. You need to use the gain control region only in one region |
| ALG_CTRL_ERR_FAILED_TO_SET_GAINCTRL_AT_SENSOR | 0x0009 | An internal error occurred while setting the gain control region parameters |
| ALG_CTRL_ERR_STOP_GAIN_FACTOR_OUT_OF_RANGE | 0x000A | The stop gain factor is out of range |
| ALG_CTRL_ERR_GAINCTRL_OFFSET_Y_TOO_SMALL | 0x000B | The gain control region 111ffset is too small! It must be larger than 2 when using no frame trigger. When using frame trigger the sum of trigger delay lines and gain control region 111ffset must be atleast 2. |
| ALG_CTRL_ERR_GAINCTRL_OFFSET_Y_TOO_LARGE | 0x000C | The gain control region 111ffset is too large! It must be less than or equals to: Height – GainControlRegionHeight when using no frame trigger. When using frame trigger the sum of trigger delay lines and gain control region 111ffset must be less than 32767. |
| ALG_CTRL_ERR_GAINCTRL_TARGET_VALUE_OUT_OF_RANGE | 0x000D | The gain control target value is out of range |

| | | |
|--|--------|--|
| ALG_CTRL_ERR_BRIGHTNESS_CONTRAST_GAIN_OUT_OF_RANGE | 0x000E | The contrast (gain) value of the brightness contrast feature is out of range |
| ALG_CTRL_ERR_BRIGHTNESS_CONTRAST_OFFSET_OUT_OF_RANGE | 0x000F | The brightness (offset) value of the brightness contrast feature is out of range |
| ALG_CTRL_ERR_GAIN_VALUE_OUT_OF_RANGE | 0x0010 | The gain value is out of range |
| ALG_CTRL_ERR_GAIN_AUTO_AVG_SAMPLES_OUT_OF_RANGE | 0x0011 | The average samples value is out of range |
| ALG_CTRL_ERR_GAMMA_VALUE_OUT_OF_RANGE | 0x0012 | The gamma value is out of range |
| ALG_CTRL_ERR_INVALID_PARAMETER | 0x0013 | The parameter is invalid! |
| ALG_CTRL_ERR_SENSOR_SENSITIVITY_VALUE_OUT_OF_RANGE | 0x0014 | The sensor sensitivity is out of range |
| ALG_CTRL_TIMEOUT_READING_VIDEOLEVEL | 0x0015 | Timeout occurred at reading video level |
| ALG_CTRL_ERROR_ADAPT_TARGETVALUE | 0x0016 | Error at adapting Target value for GainControlRegion |

18.2.3 Acquisition Control (ACQ_CTRL_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the

[ACQ_CTRL_ERROR_CATEGORY \(0x0003\).](#)

| Definition | Value | Description |
|---|--------|---|
| ACQ_CTRL_ERR_FEATURE_CHANGE_DURING_IMG_ACQ | 0x0001 | The feature change is not allowed while grabbing |
| ACQ_CTRL_ERR_TRG_SELECTOR_INVALID | 0x0002 | The trigger selector is invalid |
| ACQ_CTRL_ERR_TRG_SIG_DETEC_MODE_NOT_AVAILABLE | 0x0003 | The trigger signal detection mode is invalid for LineStart. You need to use TriggerSignalDetectionMode feature only for FrameStart or FrameActive |
| ACQ_CTRL_ERR_LINE_TRG_SRC_INVALID | 0x0004 | The selected source for line trigger is invalid |
| ACQ_CTRL_ERR_TRG_ACTIV_INVALID | 0x0005 | The trigger activation value is invalid |
| ACQ_CTRL_ERR_TRG_SRC_USED_BY_LINE_START | 0x0006 | The trigger source is already assigned for LineStart. You need to use different source for LineStart and FrameStart/Active |
| ACQ_CTRL_ERR_TRG_FRAME_START_ACTIV_INVALID | 0x0007 | The trigger activation is invalid for FrameStart. You can use RisingEdge/FallingEdge for FrameStart |
| ACQ_CTRL_ERR_TRG_FRAME_ACTIVE_ACTIV_INVALID | 0x0008 | The trigger activation is invalid for FrameActive. You can use LevelHigh/LevelLow for FrameActive |
| ACQ_CTRL_ERR_FRAME_TRG_SRC_INVALID | 0x0009 | The selected source for frame trigger is invalid |
| ACQ_CTRL_ERR_MASTER_TRG_SRC_INVALID | 0x000A | The source (encoder0, Line1, Line2 and InternalLB) for SelectMaster_Input trigger is invalid |
| ACQ_CTRL_ERR_EXPOSURE_TIME_TOO_SMALL | 0x000B | The exposure time is too small |
| ACQ_CTRL_ERR_EXPOSURE_TIME_TOO_LARGE | 0x000C | The exposure time is too large |
| ACQ_CTRL_ERR_LINE_TIME_TOO_SMALL | 0x000D | The line time is too small. It must be at least 1.5us larger than integration time |
| ACQ_CTRL_ERR_LINE_TIME_TOO_LARGE | 0x000E | The line time is too large |
| ACQ_CTRL_ERR_LINE_TIME_TOO_SMALL_RUNTIME | 0x000F | The line time is too small, when considering run time parameters |
| ACQ_CTRL_ERR_FRAME_START_MODE_ON | 0x0010 | FrameActive mode cannot be made On because FrameStart mode is already On |

| | | |
|---|--------|---|
| ACQ_CTRL_ERR_FRAME_ACTIVE_MODE_ON | 0x0011 | FrameStart mode cannot be made On because FrameActive mode is already On |
| ACQ_CTRL_ERR_DEBOUNCING_MODE_INVALID | 0x0012 | Invalid debouncing mode |
| ACQ_CTRL_ERR_TRIGGER_DIV_OUT_OF_RANGE | 0x0013 | The trigger divider value is out of range |
| ACQ_CTRL_ERR_TRIGGER_DIV_NOT_AVAILABLE | 0x0014 | The trigger divider is not available for the selected trigger (FrameStart/Active) |
| ACQ_CTRL_ERR_TRG_SRC_USED_BY_FRAME_START_ACTIVE | 0x0015 | The trigger source is already assigned for either FrameStart or FrameActive. You need to use different source for LineStart and FrameStart/Active |
| ACQ_CTRL_ERR_TRG_LINE_ACTIV_INVALID | 0x0016 | The trigger activation value is invalid for LineStart. You can use only RisingEdge for LineStart |
| ACQ_CTRL_ERR_TRG_DELAY_LINES_NOT_AVAILABLE | 0x0017 | The trigger delay lines is invalid for LineStart. You can use trigger delay lines only for FrameStart/Active |
| ACQ_CTRL_ERR_LINE_START_DISABLE_INVALID | 0x0018 | Invalid LineStart Disable |
| ACQ_CTRL_ERR_INVALID_SELECTOR_TRIGGER_DISABLE | 0x0019 | The trigger disable is invalid for FrameStart/Active. You can use trigger disable only for LineStart |
| ACQ_CTRL_ERR_SELECTOR_ID_LINE_IS_OUTPUT | 0x001A | The trigger source used is not configured correctly which is the line mode to output. You need to set the selected line mode to input |
| ACQ_CTRL_ERR_INVALID_PARAMETER | 0x001B | The parameter is invalid! |
| ACQ_CTRL_ERR_FRAME_RATE_ENABLE | 0x001C | The AcquisitionFrameRateEnable feature can be enabled only if the mode of all frame triggers is set to off! |
| ACQ_CTRL_ERR_FRAME_RATE_RANGE | 0x001D | The acquisition frame rate value is out of range! |
| ACQ_CTRL_ERR_FEATURE_LOCKED | 0x001E | The feature is currently locked and cannot be written. |
| ACQ_CTRL_ERR_TRG_FRAME_RATE_ENABLE_INVALID | 0x001F | Enabling a frame trigger is not permitted if the AcquisitionFrameRateEnable feature is set. |
| ACQ_CTRL_ERR_MASTER_SLAVE_MODE_INVALID | 0x0020 | The master slave mode is invalid. |
| ACQ_CTRL_ERR_MASTER_SLAVE_INTERFACE_INVALID | 0x0021 | The master slave interface is invalid Or invalid interface with respect to master or slave. |
| ACQ_CTRL_ERR_ENABLING_INTERFACE_NOT_ALLOWED | 0x0022 | Enabling externalandinternal, internalandcascade or cascade interface is not permitted for slave camera. |
| ACQ_CTRL_ERR_MASTER_SLAVE_NOT_CONFIGURED | 0x0023 | Master slave is not configured properly. Enable any master slave interface. |
| ACQ_CTRL_ERR_LINE3_USED_AS_TRIGGER_SOURCE | 0x0024 | Enabling AutoSelect mode is not permitted if Line3 is used as TriggerSource. |
| ACQ_CTRL_ERR_AUTOSELECT_MODE_ON | 0x0025 | Enabling the selected trigger is not allowed if trigger source is Line3 in AutoSelect mode of master slave configuration. |
| ACQ_CTRL_ERR_TDI_INVALID | 0x0026 | Invalid time delay integration value. |
| ACQ_CTRL_TDI_NOT_AVAILABLE | 0x0027 | TDI feature is not available for color sensor. |
| ACQ_CTRL_ERR_FRAME_ACTIVE_EXTEND_LINES_IS_OUT_RANGE | 0x0028 | Frame active extend lines is out of range. |
| ACQ_CTRL_ERR_EXTEND_LINES_NOT_AVAILABLE | 0x0029 | Frame Active Extend Lines feature is not available for FrameStart and LineStart trigger. |
| ACQ_CTRL_ERR_ACQ_START_DURING_IMG_CAL | 0x002A | Acquisition cannot be started during internal DSNU or PRNU calibration process. Try again later. |

18.2.4 Digital IO Control (DIG_IO_CTRL_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the [DIG_IO_CTRL_ERROR_CATEGORY \(0x0004\)](#).

| Definition | Value | Description |
|--|--------|---|
| DIG_IO_CTRL_ERR_LINE_SELECTOR_INVALID | 0x0001 | The line selector is invalid |
| DIG_IO_CTRL_ERR_USEROUTPUT_SELECTOR_INVALID | 0x0002 | The user output selector is invalid |
| DIG_IO_CTRL_ERR_LINE_INVALID_MODE | 0x0003 | The Line1 and Line2 selector are always input only |
| DIG_IO_CTRL_ERR_LINE_IS_INPUT | 0x0004 | The selected line mode is not valid with respect to the line source. You need to use the selected line mode to output |
| DIG_IO_CTRL_ERR_LINE_MODE_CHANGE_NOT_ALLOWED | 0x0005 | The selected line mode change is not allowed. The selected line is used either as a trigger source or as an encoder source |
| DIG_IO_CTRL_ERR_LINE_SOURCE_IN_USE | 0x0006 | The selected line source is already assigned for other line. Either change the line source of other line or the selected line |

18.2.5 Encoder Control (ENC_CTRL_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the [ENC_CTRL_ERROR_CATEGORY \(0x0005\)](#).

| Definition | Value | Description |
|---------------------------------------|--------|---|
| ENC_CTRL_ERR_ENC_SELECTOR_INVALID | 0x0001 | The encoder selector is invalid |
| ENC_CTRL_ERR_SRC_A_INVALID | 0x0002 | The encoder source A is invalid |
| ENC_CTRL_ERR_SRC_B_INVALID | 0x0003 | The encoder source B is invalid |
| ENC_CTRL_ERR_ENC_MODE_INVALID | 0x0004 | The encoder mode is invalid |
| ENC_CTRL_ERR_ENC_AVG_INC_OUT_OF_RANGE | 0x0005 | The encoder average is out of range |
| ENC_CTRL_ERR_OUT_MODE_INVALID | 0x0006 | The encoder output mode is invalid |
| ENC_CTRL_ERR_SRC_IN_USE_BY_INPUTB | 0x0007 | The source is already assigned to input B of the selected encoder. You need to use different source for input A and input B |
| ENC_CTRL_ERR_SRC_IN_USE_BY_INPUTA | 0x0008 | The source is already assigned to input A of the selected encoder. You need to use different source for input A and input B |
| ENC_CTRL_ERR_ENC_DIV_OUT_OF_RANGE | 0x0009 | The encoder divider value is out of range |
| ENC_CTRL_ERR_SELECTED_LINE_IS_OUTPUT | 0x000A | The encoder source A or B used is not configured correctly. You need to set the selected line mode to input. |

18.2.6 User Set Control (USER_SET_CTRL_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the [USER_SET_CTRL_ERROR_CATEGORY \(0x0006\)](#).

| Definition | Value | Description |
|---|--------|--|
| USER_SET_CTRL_ERR_SELECTOR_INVALID | 0x0001 | Invalid user set selector |
| USER_SET_CTRL_ERR_DEFAULT_READ_ONLY | 0x0002 | The default user set modification is not allowed |
| USER_SET_CTRL_ERR_LOAD_USER_SET_FAILED | 0x0003 | An error occurred while loading the user set |
| USER_SET_CTRL_ERR_LOAD_USER_SET_CMD_VAL_INVALID | 0x0004 | Invalid load user set command value |

18.2.7 Image Calibration Control (ICC_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the [ICC_ERROR_CATEGORY \(0x0007\)](#).

| Definition | Value | Description |
|---|--------|---|
| ICC_ERR_LINE_DISTANCE_OUT_OF_RANGE | 0x0001 | The line distance is out of range |
| ICC_IMG_CAL_MODE_ERR_INVALID_PARAMETER | 0x0002 | ImageCalibrationMode is out of range |
| ICC_IMG_CAL_AUTO_ERR_INVALID_PARAMETER | 0x0003 | ImageCalibrationAuto is out of range |
| ICC_IMG_CAL_FEATURES_LOCKED | 0x0004 | The selected feature is locked due to an image calibration mode is active |
| ICC_IMG_CAL_PRNU_NODSNULUT_ACTIVE | 0x0005 | For PRNU calibration a valid and loaded DSNU is needed |
| ICC_ERR_SCAN_DIR_CHANGE_NOT_ALLOWED | 0x0006 | Scan direction is read only when scan direction source is not internal |
| ICC_ERR_SCAN_DIR_EXT_SRC_NOT_CONFIGURED | 0x0007 | The Encoder0 is not configured properly for the use of ScanDirectionSource. You need to configure EncoderSourceA and EncoderSourceB |

18.2.8 LUT Control (LUT_CTRL_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the [LUT_CTRL_ERROR_CATEGORY \(0x0008\)](#).

| Definition | Value | Description |
|--|--------|---|
| LUT_CTRL_ERR_FFC_LUT_COULD_NOT_LOAD_DATA | 0x0001 | An error occurred while loading the LUT's data from flash |
| LUT_CTRL_ERR_INVALID_FFC_LUT | 0x0002 | The LUT does not contain valid data according to the pixel format |
| LUT_CTRL_ERR_INVALID_PARAMETER | 0x0003 | The parameter is invalid! |
| LUT_CTRL_ERR_IMG_CAL_AUTO_TIMEOUT | 0x0004 | Timeout at Internal ImageCalibration |
| LUT_CTRL_ERR_IMG_CAL_AUTO_INTERNALERROR | 0x0005 | Error at Internal ImageCalibration |

18.2.9 Color Transformation Control (CT_CTRL_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the [CT_CTRL_ERROR_CATEGORY \(0x0009\)](#).

| Definition | Value | Description |
|--------------------------------------|--------|---|
| CT_CTRL_ERR_SELECTOR_INVALID | 0x0001 | Invalid color transformation module selector. |
| CT_CTRL_VALUE_SELECTOR_INVALID | 0x0002 | Invalid color transformation value (gain or offset) selector. |
| CT_CTRL_ERR_ENABLING_NOT_ALLOWED | 0x0003 | Already other color transformation module is active. |
| CT_CTRL_ERR_GAIN_OUT_OF_RANGE | 0x0004 | Color transformation module gain value is out of range. |
| CT_CTRL_ERR_OFFSET_OUT_OF_RANGE | 0x0005 | Color transformation module offset value is out of range. |
| CT_CTRL_ERR_MODIFICATION_NOT_ALLOWED | 0x0006 | |

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|--|--------|---|
| CT_CTRL_ERR_PIXELFORMAT_INVALID_WRT_SRGB | 0x0007 | Invalid pixel format to activate sRGB. Set the pixel format to RGB8 |
|--|--------|---|

18.2.10 Device Control (DEV_CTRL_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the [DEV_CTRL_ERROR_CATEGORY \(0x000A\)](#).

| Definition | Value | Description |
|---|--------|--|
| DEV_CTRL_WARNING_TEMPERATURE_TOO_HIGH | 0x0001 | Warning! The device temperature is too high. You need to provide the cooling for the camera |
| DEV_CTRL_ERROR_TEMPERATURE_TOO_HIGH | 0x0002 | Error! The device temperature is too high. The sensor will be switched off. You need to reboot the camera to recover from this error |
| DEV_CTRL_ERROR_COULD_NOT_GET_SENSOR_TEMPERATURE | 0x0003 | An internal error occurred while getting the sensor temperature |
| DEV_CTRL_ERROR_ILLUM_TEMPERATURE_TOO_HIGH | 0x0004 | Error that the illumination temperature is too high, illumination will be switched off |
| DEV_CTRL_ERROR_ILLUM_LED_ERROR | 0x0005 | Error detected at check of LED current; LED might be defective |

18.2.11 File Access Control (FAC_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the [FAC_ERROR_CATEGORY \(0x000B\)](#).

| Definition | Value | Description |
|---|--------|--|
| FAC_ERROR_FILE_ALREADY_OPEN | 0x0001 | A file is already open |
| FAC_ERROR_INVALID_FILE_SELECTOR | 0x0002 | Invalid file selector |
| FAC_ERROR_INVALID_FILE_OPERATION_SELECTOR | 0x0003 | Invalid file operation selector |
| FAC_ERROR_INVALID_FILE_OPERATION_EXEC_VAL | 0x0004 | Invalid file operation execute command value |
| FAC_ERROR_FILE_OPERATION_IN_PROGRESS | 0x0005 | File operation is in progress |
| FAC_ERROR_NO_FILE_OPEN | 0x0006 | No file is open |
| FAC_ERROR_FILE_NOT_OPEN_OR_INVALID_OPEN_MODE | 0x0007 | Either file is not open or file open mode is not write operation |
| FAC_ERROR_NO_FILE_SELECTED | 0x0008 | No file is selected. Select any one file |
| FAC_ERROR_INVALID_FILE_CONTENT | 0x0009 | Invalid file content |
| FAC_ERROR_CHECKSUM_CALCULATION_FAILED | 0x000A | Calculation of file checksum failed |
| FAC_ERROR_CHECKSUM_ERROR | 0x000B | Comparison of calculated checksum is not matching with the given checksum |
| FAC_ERROR_INVALID_OPEN_MODE | 0x000C | File open mode is not according to the set operation (read, write) |
| FAC_ERROR_EXCESS_FILE_SIZE | 0x000D | File access (read, write) exceeds the file size(max size for writing) |
| FAC_ERROR_EXCESS_FILE_ACCESS_BUFFER_SIZE | 0x000E | File read access exceeds the file access buffer size |
| FAC_ERROR_COPY_DATA_TO_FILE_ACCESS_BUF_FAILED | 0x000F | An error occurred while copying data to the file access buffer |
| FAC_ERROR_INVALID_FILE_ACCESS_OFFSET | 0x0010 | Invalid file access offset |
| FAC_ERROR_FLASH_ACCESS_ERROR | 0x0011 | An error occurred during flash access like erase, write |
| FAC_ERROR_INVALID_OPEN_MODE_SELECTOR | 0x0012 | Invalid file open mode selector |
| FAC_ERROR_FILE_ACCESS_BUFFER_OVERRUN | 0x0013 | File access buffer overrun |
| FAC_ERROR_CLOSE | 0x0014 | Error during file close operation. The file has not been updated. The file might be invalid. |
| FAC_ERROR_CLOSE_FATAL | 0x0015 | Fatal error during file close operation. Avoid switching off camera! Redo the update! |

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| | | Otherwise, the camera might refuse to boot or problems while connecting might occur. |
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18.2.12 Led Flash Control (LED_FLASH_CTRL_ERROR_CATEGORY)

The below table contains the details of specific error belongs to the

[LED_FLASH_CTRL_ERROR_CATEGORY \(0x000C\)](#).

| Definition | Value | Description |
|--|--------|--|
| LED_FLASH_CTRL_ERR_NO_OF_PATTERN_INVALID | 0x0001 | Number of pattern value is invalid |
| LED_FLASH_CTRL_ERR_PATTERN_SELECTOR_INVALID | 0x0002 | Invalid pattern selector |
| LED_FLASH_CTRL_ERR_INVALID_FRAME_CONTROL | 0x0003 | Frame control is invalid |
| LED_FLASH_CTRL_ERR_SEQUENCE_TIME_INVALID | 0x0004 | Sequence time is less than the sum of all active pattern on time |
| LED_FLASH_CTRL_ERR_FLASH_OUT_ON_TIME_INVALID | 0x0005 | Flash out on time of the selected pattern is invalid |
| LED_FLASH_CTRL_ERR_FLASH_OUT_OFF_DELAY_INVALID | 0x0006 | Flash out off delay of the selected pattern is invalid |

19 Debug Control

This feature might be removed in future releases!

19.1 Full-Flag

| | | |
|---------------------------|--|--------|
| Name | FullFlag | Custom |
| Description | Indicates an internal framebuffer FIFO overflow. | |
| Interface | Integer | |
| Access mode | Read only | |
| Adjustable while grabbing | - | |
| Value range | 0: No overflow 1: An overflow occurred | |
| Default value | - | |
| Notes | - | |
| Error behavior | - | |

20 Document History

| Date | Version | Author | Changes |
|--------------------------------|---------|--------|--|
| 5 th February 2020 | 1.0.0 | - | Prepared document for initial release. |
| 29 th April 2020 | 1.2.0 | FG | Introduced RGB10p32 pixel format. Adapted the maximum exposure time and min line time . |
| 20 th May 2020 | 1.3.0 | FG | Set the maximum Image Height to 1015811. |
| 8 th June 2020 | 1.4.0 | FG | Added Decimation Horizontal Float . It is not available in this version. |
| 8 th June 2020 | 1.4.0 | HR | Chapter Sensor Resync Counter removed |
| 10 th June 2020 | 1.5.0 | FG | Added the Stream Region Width feature. |
| 8 th July 2020 | 1.6.0 | FG | Removed the Stream Region Width Feature. It's not required anymore from sphinx library version 2.4.1 and later. |
| 16 th July 2020 | 1.7.0 | AB | Added CDS Gain , FullWellCapacity and LedFlashControl |
| 24 st August 2020 | 1.9.0 | FG | Reduced the value range of GainControlRegionOffsetY . Minimum value is now set to 3 (If no frame trigger is used) Adapted description of DecimationHorizontalFloat and BinningHorizontal . Added note that the Region parameters will be scaled. Adapted range of BinningHorizontal feature and added a note regarding the value range. Added new error code IMF_ERR_DECIMATION_HOR_OUT_OF_RANGE Adapted value range of Gain Control Region Width . It is independent of binning now. The GainControlRegionOffsetX value range depends on the SensorWidth now and not on the WidthMax feature anymore. |
| 12 th October 2020 | 2.0.0 | AB | Removed CDS Gain, FullWellCapacity and FileValidateCommand Added SensorSensitivityChannelSelector and SensorSensitivity Replaced cds gain error code with sensor sensitivity error code |
| 13 th October 2020 | 2.0.0 | AB | Introduced Frame Active Extend Lines feature |
| 14 th October 2020 | 2.0.0 | FG | Added features Sensor Offset X and Sensor Region Width |
| 29 th October 2020 | 2.1.0 | FG | Extended description for All entry of sensor sensitivity channel selector . |
| 17 th November 2020 | 2.2.0 | FG | Introduced GainAutoStatus feature. Adapted description of GainSelector as well as Gain feature for analog and digital gain. Added hint in GainAuto to check GainAutoStatus after performing Once gain calibration. |

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|--------------------------------|--------|----|--|
| 24 th November 2020 | 2.3.0 | AB | Introduced ExposureTimeMode and ExposureTimeSelector feature. |
| 1 st December 2020 | 2.4.0 | FG | Added list of locked features in description of Image Calibration Mode . |
| 10 th December 2020 | 2.5.0 | FG | <ul style="list-style-type: none"> - Revised Document (Adaptions from PK inserted) - Updated the ExposureTime value range description. - Added information concerning the Digital Gain to ImageCalibrationMode. |
| 11 th December 2020 | 2.5.0 | AB | <ul style="list-style-type: none"> - Added new device error code - Added DeviceErrorMessage feature |
| 14 th December 2020 | 2.5.0 | FG | <ul style="list-style-type: none"> - Adapted description of DeviceErrorMessage feature. - Added some additional information to DeviceErrorCode feature. - Reference DeviceErrorMessage feature in section 6.2 now. |
| 14 th December 2020 | 2.5.0 | AB | <ul style="list-style-type: none"> - Removed extra rows from the specific error code table of Digital IO control |
| 2 nd February 2021 | 2.6.0 | UB | <ul style="list-style-type: none"> - AdjustTargetValueToMaxVideo added to Gain Auto - Enums added to Gain Auto Status - Enum "All" added to Gain Control Region Channel Selector - Enums changed and new added to Image Calibration Mode - Some Items added to DeviceErrorCode |
| 10 th February 2021 | 2.6.0 | FG | <ul style="list-style-type: none"> - Removed EEPROM file from File Selector. - Added some device error codes for File Access Control - Adapted the File Operation Status fatal error description. - Added some general note to File Access Control section. - Removed timeout description from File Operation Execute - Added section for timeout parameters Connection Timeouts |
| 24 th February 2021 | 2.7.0 | HR | <ul style="list-style-type: none"> - Added new feature Infoblock Mode |
| 18 th March 2021 | 2.8.0 | AB | <ul style="list-style-type: none"> - Added features of CoaxPress in Transport Layer category - Added new feature DeviceTapGeometry |
| 4 th June 2021 | 2.11.0 | AB | <ul style="list-style-type: none"> - Added new feature ScanDirectionSource - Added some note for ScanDirection feature. - Increased document version |
| 10 th June 2021 | 2.12.0 | FG | <ul style="list-style-type: none"> - Added SingleFrame entry to AcquisitionMode feature. - Revised AcquisitionStart and AcquisitionStop description. |
| 14 th June 2021 | 2.12.0 | AB | <ul style="list-style-type: none"> - Added AcquisitionAbort and TLParamsLocked features |
| 16 th June 2021 | 2.13.0 | FG | <ul style="list-style-type: none"> - Extended description for GainAuto AdjustTargetValueToMaxVideo |
| 16 th June 2021 | 2.13.0 | AB | <ul style="list-style-type: none"> - Extended the description for AutoSelect in MasterSlaveMode - Adopted 'note' for AcquisitionAbort |
| 18 th June 2021 | 2.13.0 | AB | <ul style="list-style-type: none"> - Added CxpLinkConfigurationPreferred feature. |

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|---|--------|-------|---|
| | | | <ul style="list-style-type: none"> - Removed Auto enum entry from CxpLinkConfiguration |
| 21 st June 2021 | 2.13.0 | FG | <ul style="list-style-type: none"> - Added new device error code to Acquisition Control (ACQ_CTRL_ERROR_CATEGORY) |
| 25 th June 2021 | 2.15.0 | AB | <ul style="list-style-type: none"> - Changed Minimum value of EncoderDividerFloat |
| 29 th June 2021 1 st July 2021 | 3.0.0 | FG/AB | <ul style="list-style-type: none"> - Added Feature Availability overview. - Change heading levels - Change format to match more to allPIXA evo manual. - Moved Light Controller section more to end. - Removed Special Feature section TLParamsLocked is part from Transport Layer Control. - Grouped transport layer into GigE Vision and CoaXPress features. - Extended the features and linking, depending on their selector. - Some bug fixes, cleaning, and minor changes. |
| 19 th August 2021 | 3.5.0 | AB | <ul style="list-style-type: none"> - Added value range for MeasuredLineTime feature |
| 23 rd August 2021 | 3.6.0 | AB | <ul style="list-style-type: none"> - Added PixelColorFilter feature - Added Availability row in all features table to indicate for which camera variants is available - Added RGBa enum entry in PixelFormat feature - Adopted value range and default value for SensorSensitivity, ExposureTimeMode, ExposureTimeSelector, LineDistance and BinningHorizontal. |
| 28 th September 2021 | 3.7.0 | AB | <ul style="list-style-type: none"> - Increased xml and document version |
| 22 nd October 2021 | 3.8.0 | FG | <ul style="list-style-type: none"> - Adapted the encoder mode feature description. |
| 28 th October 2021 | 3.9.0 | FG | <ul style="list-style-type: none"> - Updated the feature availability matrix. |
| November 2021 | 3.10.0 | AB/FG | <ul style="list-style-type: none"> - Adapted description of some features: <ul style="list-style-type: none"> o Synchronization Mode Enable o Gain Control Region Offset X o Gain Control Region Channel Selector o Gamma - Corrected some page breaks - Adapted description of Color Transformation Features regarding availability. - Added Notes for AcquisitionLineRate, AcquisitionLineTime, AcquisitionFrameRateEnable, AcquisitionFrameRate and all the TriggerSelector features - Reworked Color Transformation Value Selector a little. Added transformation matrices to Color Transformation Selector - Added Notes for ScanDirectionSource and ScanDirection features |
| 26 th November 2021 | 3.11.0 | FG | <ul style="list-style-type: none"> - Added note to create new DSNU/PRNU references in Gain, Sensor Sensitivity |
| November/December | 3.12.0 | FG/AB | <ul style="list-style-type: none"> - Extended the info block mode description and fixed some error there. - Adapted the LineDistance and AcquisitionLineTime/AcquisitionLineRate default values. - Refactored document. Updated and extended some entries and fixed some bugs. - Updated the valid range for Out1OnTime, Out2OnTime, Out3OnTime, Out4OnTime, |

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|---------------|--------|----|---|
| | | | PatternOffDelay and LedFlashSequenceTime for different variants. - Added some Info to Led Flash Enable regarding Master Slave Mode |
| December 2021 | 3.13.0 | FG | - Fixed some typos in Infoblock Mode |
| January 2022 | 3.14.0 | FG | - Removed outdated information in Color Transformation Enable |