Allied Vision

CAMERA LINK SWIR CAMERAS

Goldeye Camera Link

Register Controls Reference

V1.0.0

Allied Vision Technologies GmbH // Taschenweg 2a, 07646 Stadtroda, Germany

2021-Nov-12

This reference at a glance

Overview

Read this reference carefully

Read this reference to fully understand your camera's register controls.

This reference describes registers to control Allied Vision Goldeye CL cameras, including Cool, stabilized, and TECless models.

Data in this document is frozen

This document is not being maintained after the initial release.

If you need further information on Goldeye CL register controls, please visit www.alliedvision.com/en/about-us/contact-us/technical-support-repair-/-rma

Further information and feedback

- For more information on Goldeye CL cameras, including the Goldeye G/CL Features Reference, see www.alliedvision.com/en/support/technical-documentation/goldeye-gcl-documentation.
- For feedback or technical questions, please visit www.alliedvision.com/en/support.

Availability of register controls and values

Functionalities described in this document may not be supported by every Goldeye CL model. Value ranges may differ between models as well.

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Document history and conventions

This chapter includes:

Document history

Version	Date	Remarks
V1.0.0	2021-Nov-12	Initial document release as an excerpt from the Goldeye G/CL Features Reference V1.5.1.

Conventions used in this reference

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

Styles

This register controls reference uses specific text formatting to help the reader find his way around. The following table gives an explanation of the formatting used.

Style (example)	Function
Emphasis	Some important parts or items of the text are emphasized to make them more visible.
`Registers names`	Camera Link register names are displayed as mono-spaced text.
`Registers options`	Options for registers that are selectable by the user are displayed as mono-spaced italicized text.
`Commands and inputs`	Text or command to type in by the user, selected menu options, or other selectable options.
`Source code`	Code words of programs and code examples, used in running text. Mainly designated for use in software documentation.
User Interface elements	Text that is displayed, or output, by the system for the user, like parts of the GUI, dialog boxes, buttons, menus, important information, or windows titles.
Weblinks and Reference	References to other documents or webpages, like weblinks, hypertext links, emails, but also cross references, that include a link the user can follow by clicking.

Table 1: Markup conventions used in this register controls reference .

Access mode

Abbreviation	Meaning
R/W	Register is read or write.
R/(W)	Register is readable, and it may be read or write depending on the user privilege level.
R/C	Register is read-only and constant.
R	Register is read-only and may change.
W	Register is write-only.

Table 2: Abbreviations used in this register controls reference

Symbols and notes

This symbol highlights a practical tip that helps to better understand the camera's functionalities, and to make better use of it.

Safety-related instructions to avoid malfunctions

This symbol indicates important or specific instructions or procedures that are related to product safety. You need to follow these instructions to avoid malfunctions.

This symbol highlights URLs for further information.

Order and description scheme

This register controls reference describes registers ordered by categories.

Copyright and trademarks

Image data flow and controls order

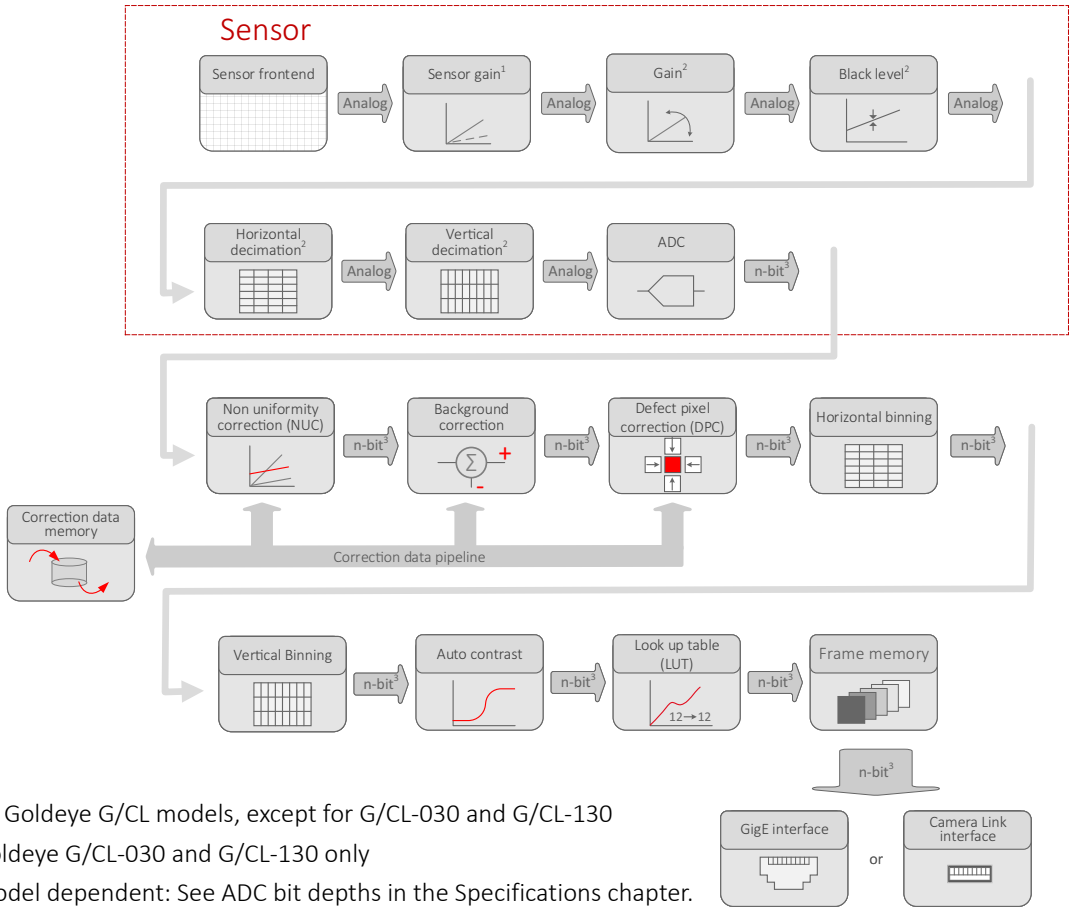
This chapter includes:

Image data flow

To develop your application effectively, note the order in which the controls are processed in Goldeye G/CL cameras.

In the Goldeye G/CL User Guide, the image data flow describes the sequence of image processing steps inside the camera. The shown functionalities represent controls or control groups.

Note that, depending on firmware version, not all of the modules and controls shown in Figure 1 are available.



[1] All Goldeye G/CL models, except for G/CL-030 and G/CL-130

[2] Goldeye G/CL-030 and G/CL-130 only

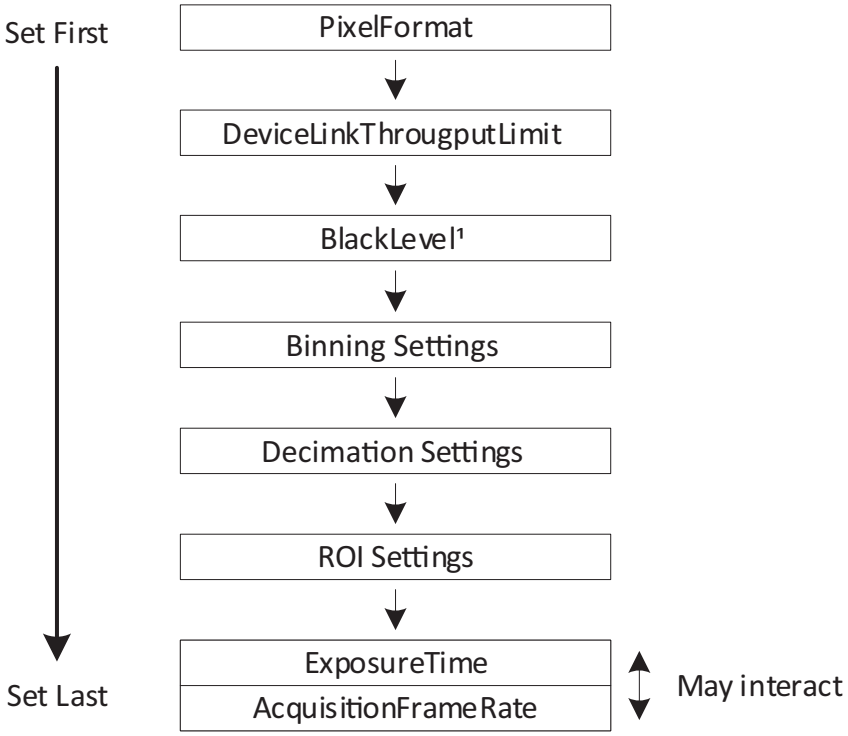
[3] Model dependent: See ADC bit depths in the Specifications chapter.

Figure 1: Goldeye G/CL image data flow

This behavior includes other controls as well as described in Value changes by control interdependencies on page 14.

Value changes by control interdependencies

The conversion between time and clock cycles affects control values. Controls for pixel format, bandwidth, ROI, exposure time, and triggering are related to each other. Changing values for one control can change values for another control. For example, frame rates can be reduced when `PixelFormat` is changed subsequently. Figure 2 shows the interdependencies.



[1] Goldeye G/CL-030 TEC1 and G/CL-130 TEC1 only

Figure 2: Interdependencies between controls

Effects for the interdependent controls

Changing one control's value affects other control's values, such as:

If: `Height` value is changed.
Then: Other values may be affected, such as for `AcquisitionFrameRate` and `ExposureTime`.

We recommend you to consider:

- The more controls you adjust, the more current values deviate from previously set values.
- The same effects that apply to `ExposureTime`, also apply to `AutoExposure`.
- To avoid readjustments, apply settings in the order shown in Figure 2.

Camera Link registers

This chapter describes the registers for all Goldeye CL models.

Data in this chapter is not current

Register descriptions were updated the last time for V1.3.1 of this document (firmware version: 02.18.20213) on 2020-Mar-20.

If you need information on new registers, please visit www.alliedvision.com/en/about-us/contact-us/technical-support-repair-/-rma.

Introduction to Camera Link registers

Controlling the camera

The camera is to be controlled using the GenCP (GenICam Generic Control Protocol). GenCP is packet based and it uses a virtual 64-bit address space that contains all control registers of the camera.

In the following, a short introduction to GenCP will be given, however it is recommended to also refer to the standard which can be downloaded here:

http://www.emva.org/wp-content/uploads/GenCP_1.1.pdf

Introduction to GenCP

Even though GenCP is intended to be media independent, a few considerations have to be made when it is used with Camera Link devices. This introduction will focus on the use of GenCP with Camera Link models only.

In order to access registers in the GenCP address space, GenCP defines the ReadMem command and the WriteMem command. These commands are issued by the host and sent to the camera. The camera decodes and processes them and returns an appropriate acknowledge packet.

Each packet is divided into three subranges: the serial prefix, CCD, and SCD.

Note that for Camera Link, all protocol data is transferred in big endian format.

ReadMem Command Packet Layout

In order to read a camera register, the host has to issue a `ReadMem` command. The command consists of a single packet that is described in the following tables.

Offset [Bytes]	Size [Bytes]	Name	Description
0	2	Preamble	Preamble that contains the bytes *0x01* and *0x00*.
2	2	CCD Checksum	16 bit checksum that is built over the channel_id and the CCD of the packet. Note that this is not a classic CRC calculation as suggested by the standard! Refer to GenCP Checksum Calculation Function on page 7-21 for more information.
4	2	SCD Checksum	16 bit checksum that is built over channel_id, CCD and SCD of the packet. Note that this is not a classic CRC calculation as suggested by the standard! Please refer to GenCP Checksum Calculation Function on page 7-21 for more information.
6	2	channel_id	This value is *0* for the control channel.

Table 3: ReadMem Command packet layout - Subrange: Serial prefix

Offset [Bytes]	Size [Bytes]	Name	Description
8	2	flags	Bit 0..13: reserved (= 0) Bit 14: `RequestAck` (must be set if the sender commands an acknowledge packet from the camera. This will usually be 1.) Bit 15: `CommandResend` (This bit should be set, if the host did not receive a valid reply to a previous command. In this case the packet can be resent with this bit set.)
10	2	command_id	This value is 0x0800 for `ReadMem` commands.
12	2	length	Defines the length of the SCD part of the packet. For `ReadMem` commands, this value is *12*.
14	2	request_id	This is a packet identifier that should be incremented by the host each time it issues a new command. If resending a packet, the request_id should be the same as in the original packet.

Table 4: ReadMem Command packet layout - Subrange: CCD

Offset [Bytes]	Size [Bytes]	Name	Description
16	8	register address	This is a 64 bit value defining the address to read from.
24	2	reserved	0
26	2	read length	This value defines the number of bytes to read from the desired address. The GenCP Standard recommends requesting not more than 1000 bytes.

Table 5: ReadMem Command packet layout - Subrange: SCD

GenCP ReadMem Acknowledge Packet Layout

After the host sent a `ReadMem` command to the camera, the camera will reply with a `ReadMem Acknowledge`. The acknowledge consists of a single packet that is described in the following tables.

Offset [Bytes]	Size [Bytes]	Name	Description
0	2	Preamble	Preamble that contains the bytes 0x01 and 0x00.
2	2	CCD Checksum	16 bit checksum that is built over the channel_id and the CCD of the packet. Note that this is **not** a classic CRC calculation as suggested by the standard! Please refer to GenCP Checksum Calculation Function on page 7-21 for more information.
4	2	SCD Checksum	16 bit checksum that is built over channel_id, CCD and SCD of the packet. Note that this is **not** a classic CRC calculation as suggested by the standard! Please refer to GenCP Checksum Calculation Function on page 7-21 for more information.
6	2	channel_id	This value is *0* for the communication channel.

Table 6: ReadMem Acknowledge packet layout - Subrange: Serial prefix

Offset [Bytes]	Size [Bytes]	Name	Description
8	2	status code	If =*0*, the `ReadMem` command was processed successfully. If !=*0*, an error occurred. Please refer to the GenCP standard for further details.
10	2	command_id	This value is *0x0801* for `ReadMem` acknowledges.
12	2	length	Defines the length of the SCD part of the packet. For `ReadMem` acknowledges, this value equals the payload data length in bytes.
14	2	request_id	This is a packet identifier that reflects the request_id of the `ReadMem` command this acknowledge belongs to.

Table 7: ReadMem Acknowledge packet layout - Subrange: CCD

Offset [Bytes]	Size [Bytes]	Name	Description
16	length	payload	This is the payload data returned from the camera's register map.

Table 8: ReadMem Command packet layout - Subrange: SCD

GenCP WriteMem Command Packet Layout

In order to write to a camera register, the host has to issue a `WriteMem Command`. The command consists of a single packet that is described in the following tables.

Offset [Bytes]	Size [Bytes]	Name	Description
0	2	Preamble	Preamble that contains the bytes *0x01* and *0x00*.
2	2	CCD Checksum	16 bit checksum that is built over the channel_id and the CCD of the packet. Note that this is not a classic CRC calculation as suggested by the standard! Please refer to GenCP Checksum Calculation Function on page 7-21 for more information.
4	2	SCD Checksum	16 bit checksum that is built over channel_id, CCD and SCD of the packet. Note that this is **not** a classic CRC calculation as suggested by the standard! Please refer to GenCP Checksum Calculation Function on page 7-21 for more information.
6	2	channel_id	This value is *0* for the communication channel.

Table 9: WriteMem Command packet layout - Subrange: Serial prefix

Offset [Bytes]	Size [Bytes]	Name	Description
8	2	flags	Bit 0..13: reserved (= *0*) Bit 14: `RequestAck` (must be set if the sender commands an acknowledge packet from the camera. This will usually be *1*.) Bit 15: `CommandResend` (This bit should be set, if the host did not receive a valid reply to a previous command. In this case the packet can be resent with this bit set.)
10	2	command_id	This value is *0x0802* for `WriteMem` commands.
12	2	length	Defines the length of the SCD part of the packet. For `WriteMem` commands, this value is 8 + payload length. The GenCP standard recommends to not generate packets with more than 1000 bytes of payload data.
14	2	request_id	This is a packet identifier that should be incremented by the host each time it issues a new command. If resending a packet, the request_id should be the same as in the original packet.

Table 10: WriteMem Command packet layout - Subrange: CCD

Offset [Bytes]	Size [Bytes]	Name	Description
16	8	register address	This is a 64 bit value defining the address to write to.
24	8	payload	This is the payload data that is to be written to the camera.

Table 11: WriteMem Command packet layout - Subrange: SCD

GenCP WriteMem Acknowledge Packet Layout

After the host sent a `WriteMem` command to the camera, the camera will reply with a `WriteMem Acknowledge`. The acknowledge consists of a single packet that is described in the following tables.

Offset [Bytes]	Size [Bytes]	Name	Description
0	2	Preamble	Preamble that contains the bytes *0x01* and *0x00*.
2	2	CCD Checksum	16 bit checksum that is built over the channel_id and the CCD of the packet. Note that this is **not** a classic CRC calculation as suggested by the standard! Please refer to GenCP Checksum Calculation Function on page 7-21 for more information.
4	2	SCD Checksum	16 bit checksum that is built over channel_id, CCD and SCD of the packet. Note that this is **not** a classic CRC calculation as suggested by the standard! Please refer to GenCP Checksum Calculation Function on page 7-21 for more information.
6	2	channel_id	This value is *0* for the communication channel.

Table 12: WriteMem Acknowledge packet layout - Subrange: Serial prefix

Offset [Bytes]	Size [Bytes]	Name	Description
8	2	status_code	If =*0*, the `WriteMem` command was processed successfully. If `!=0`, an error occurred. Please refer to the GenCP standard for further details.
10	2	command_id	This value is *0x0803* for `WriteMem` acknowledges.
12	2	length	Defines the length of the SCD part of the packet. For `WriteMem` acknowledges, this value is set to 4.
14	2	request_id	This is a packet identifier that reflects the request_id of the `WriteMem` format this acknowledge belongs to.

Table 13: WriteMem Acknowledge packet layout - Subrange: CCD

Offset [Bytes]	Size [Bytes]	Name	Description
16	2	reserved	Always *0*.
18	2	length written	This field defines, how many bytes of the related `WriteMem` command payload were written. This value is smaller or equal to the length field of the related `WriteMem` format.

Table 14: WriteMem Acknowledge packet layout - Subrange: SCD

GenCP Checksum Calculation Function

Because the GenCP standard is very unclear about calculating a packet's checksum, a reference implementation is provided here that shows how the calculation is to be done. The function works with GenCP packets up to 64Kb size. It assumes, that the packet data exists in memory in big endian format. Its return value, however, is in host format.

```
uint16 GenCpChecksum16(uint8* pBuffer, uint32 nNumBytes)
{
    uint32 nChecksum = 0;
    uint16 nCurVal;
    uint32 nByteCounter;
    uint32 nNumBytesEven = nNumBytes & ~(sizeof(uint16) - 1);

    // for reasons of performance, this function is limited to
       64Kb length.
    // Since the GenCP standard recommends to have
       packets <= 1Kb, this should not be a problem.

    assert(nNumBytes < 65535);

    for (nByteCounter = 0; nByteCounter < nNumBytesEven;
nByteCounter += sizeof(uint16))
    {
        // pBuffer is interpreted as an array of big endian
           16 bit values.
        nCurVal = (((uint16) pBuffer[nByteCounter]) << 8) |
((uint16) pBuffer[nByteCounter + 1]);
        nChecksum += (uint32) nCurVal;
    }

    if ((nNumBytes & (sizeof(uint16) - 1)) != 0)
    {
        // special case: buffer length is odd number

     nChecksum += (((uint32) pBuffer[nNumBytesEven]) << 8);
    }

    while ((nChecksum & 0xFFFF0000) != 0)
    {
       nChecksum = (nChecksum & 0xFFFF) + (nChecksum >> 16);
    }

    return(~((uint16) nChecksum));
}
```

Further Issues to consider when programming GenCP

- On Windows systems, the serial port of a frame grabber is accessed through a DLL provided by the grabber manufacturer. The DLL's name usually is "clserXYZ.dll" where XYZ denotes the grabber manufacturer. The DLL's API however is standardized and is described in the AIA Camera Link specification. GenCP command packet data has to be written using the "clSerialWrite" function while acknowledge packet data can be read using the "clSerialRead" function.
- An Allied Vision GenCP Camera Link camera always starts up with a baud rate of 9600 bits per second. It is possible to change this value if required, but this requires following a special command sequence described in the GenCP standard. It is not repeated here.
- Commands must not be transferred in bursts. Before a new command is sent, the host must wait for the reception of the previous acknowledge packet.
- If an acknowledge to a command packet is not received within a command timeout period of time, the command may be resent by the host with the CommandResend flag set up to 3 times. The Round Trip Time (RTT) for a command and acknowledge can be calculated by RTT = Command Transfer Time + Processing Time + Acknowledge Transfer Time. The Maximum Device Response Time (MDRT) can be queried via the MDRT bootstrap register. The MDRT for reading the MDRT register should not exceed 50ms.
- Since Allied Vision Camera Link cameras do not yet support pending acknowledges, the RTT can be considered as the command timeout period. Otherwise the host must consider the transfer time, Maximum Device Response Time and some margin for technology-dependent delays in order to calculate the command timeout period.
- If a command packet is corrupted or lost while it is sent to the camera, the camera will discard it and send no reply. After the command timeout expired, the host may resend the packet.
- An acknowledge packet is considered as lost, if the command timeout has expired. The host may resend the packet. If the host receives a corrupted acknowledge packet, it will discard it and may resend the packet without waiting for the command timeout to expire. Since the CommandResend flag is then set, the camera will detect, that this packet was already processed. It will then resend the acknowledge packet without changing its state.
- Allied Vision Camera Link cameras do not yet support pending acknowledges and event packets.

Register Types

The following register types are used within Goldeye CL models:

Register type	Explanation
IntReg	A 32-bit or 64-bit integer register. Unless other stated, integer registers are unsigned by default.
FloatReg	A 32-bit floating point register.
StringReg	A textual description containing ASCII characters terminated by a trailing zero byte.
MaskedIntReg	A subrange of an IntReg. See detailed description below.
Register	An array of contiguous bytes.

Table 15: Register types used with Goldeye CL models

GenICam Standard:

Refer to the current GenICam Standard for detailed information.

http://www.emva.org/standards-technology/genicam/

Enumeration

An enumeration assigns names to constant integer values. They are used for IntReg or MaskedIntReg registers.

Register Arrays and Indexing

Some registers consist of multiple elements of the same type but with different addresses. Throughout this document these registers are named with additional square brackets []. If needed, a named value is included in these brackets to identify a specific element of the array. Refer to the register's documentation table for address mapping.

Inquiry Registers

Not every functionality is available in all camera variants. Inquiry registers allow the camera to inform about availability of functionalities. These registers are usually several MaskedIntReg bit fields combined together under the same register address. For clarity theses registers are grouped together in one table using a common register name prefix, indicated by appended dots, for example `RegTriggerInq...`

Accessing MaskedIntReg Registers

MaskedIntReg registers refer to a specific bit range of an IntReg. When working with a MaskedIntReg on this low level then consider that the atomic read and write operation is usually aligned to an IntReg of the size of 4 bytes. The corresponding bit shifting and masking operations to read or write the MaskedIntReg need to be implemented by the user. When writing a MaskedIntReg, don't forget to set all other bits in the IntReg which are not part of the MaskedIntReg to the current read value, to avoid unintended data corruption.

Note: the **Reg** prefix is used to keep names consistent to GenICam XML-file.

Register Descriptions

Consider endianness and bit significance

When working with bit assignments, consider that your application may use an endianness and bit significance that is different from those documented in this register controls reference.

AcquisitionControl

This category includes all functionalities related to image acquisition, including the trigger and exposure control. It describes the basic model for acquisition and the typical behavior of the device.

RegAcquisitionCommand

Register is used to start and end acquisition.

Register name	`RegAcquisitionCommand`
Register type	IntReg
Access mode	W
Address	0x000130F4
Length (Bytes)	4
Bits used	31..0

Command values:	
Value	**Name and description**
0	*`AcquisitionStop`* Stop the camera receiving frame triggers. Acquisition will stop after acquisition of the current frame is complete. Valid if `RegTriggerMode[AcquisitionStop]` = *`Off`*.
1	*`AcquisitionStart`* Start the camera receiving frame triggers. Before image acquisition can occur, acquisition must be started, either by a hardware trigger or this software command. Valid if `RegTriggerMode[AcquisitionStart]` = *`Off`*.
2	*`AcquisitionAbort`* Stop the camera receiving frame triggers and abort the current acquisition immediately. Acquisition will stop immediately, but a partially transferred image will be completed.

RegTriggerInq...

Register name prefix	`RegTriggerInq...`
Register type	MaskedIntReg
Access mode	R
Address	0x00013000
Length (Bytes)	4
Bits used	23, 20, 19

Bit assignment:	
Bit	**Name and description**
19	`...AcquisitionEnd` If *1*, *`AcquisitionEnd`* trigger is supported.
20	`...AcquisitionStart` If *1*, *`AcquisitionStart`* trigger is supported.
23	`...FrameStart` If *1*, *`FrameStart`* trigger is supported.

RegAcquisitionFrameCount

Defines the number of frames to capture in a limited sequence of images. Used with `RegAcquisitionMode` = *`MultiFrame`*.

Register name	`RegAcquisitionFrameCount`
Register type	IntReg
Access mode	R/W
Address	0x00013108
Length (Bytes)	4
Bits used	31..0

Possible values	**Description**
1	Default
1	Minimum
65535	Maximum

RegAcquisitionMode

Determines the behavior of the camera when `AcquisitionStart` is triggered.

Register name prefix	`RegAcquisitionMode`
Register type	IntReg
Access mode	R/W
Address	0x00013104
Length (Bytes)	4
Default	*`Continuous`*
Bits used	31..0

Enumeration values:

Value	Name and description
1	*`Continuous`* After an acquisition start event, the camera will continuously receive frame trigger events. See `TriggerSelector` and `TriggerSource` for more information.
2	*`SingleFrame`* The camera will only deliver a single frame trigger event. Further trigger events will be ignored until acquisition is stopped and restarted
3	*`MultiFrame`* The camera will acquire the number of images specified by `AcquisitionFrameCount`. Further trigger events will be ignored until acquisition is stopped and restarted

RegAcquisitionModeInq...

Registers used to determine the acquisition modes that are available with the camera.

Register name prefix	`RegAcquisitionModeInq...`
Register type	MaskedIntReg
Access mode	R
Address	0x00013100
Length (Bytes)	4
Bits used	30..28

Bit assignment:	
Bit	**Name and description**
28	*...MultiFrame* If 1, camera supports multi frame acquisition.
29	*...SingleFrame* If 1, camera supports single frame acquisition.
30	*...Continuous* If 1, camera supports continuous acquisition.

RegAutoModeRegionHeight

Height of the auto mode region used in auto functionalities such as auto exposure and auto contrast, relative to the current image region.

Register name	`RegAutoModeRegionHeight`
Register type	IntReg
Access mode	R/W
Address	0x000140FC
Length (Bytes)	4
Bits used	31 .. 0
Units	Pixels

Possible values	Description
(Camera dependent)	Default (=Maximum height of the sensor)
1	Minimum
(Camera dependent)	Maximum (=Maximum height of the sensor)

RegAutoModeRegionOffsetX

X-offset of the auto mode region used in auto functionalities such as auto exposure and auto contrast, relative to the current image region.

Register name	`RegAutoModeRegionOffsetX`
Register type	IntReg
Access mode	R/W
Address	0x000140F0
Length (Bytes)	4
Bits used	31 .. 0
Units	Pixels

Possible values	Description
(Camera dependent)	Default (=Maximum width of the sensor)
0	Minimum
(Camera dependent)	Maximum (=Maximum used width of the sensor)

RegAutoModeRegionOffsetY

Y-offset of the auto mode region used in auto functionalities such as auto exposure and auto contrast, relative to the current image region.

Register name	`RegAutoModeRegionOffsetY`
Register type	IntReg
Access mode	R/W
Unit	Pixels
Address	0x000140F4
Length (Bytes)	4
Bits used	31 .. 0

Possible values	Description
(Camera dependent)	Default (=Maximum used height of the sensor)
0	Minimum
(Camera dependent)	Maximum (=Maximum used height of the sensor)

RegAutoModeRegionWidth

Width of the auto mode region used in auto functionalities such as auto exposure and auto contrast, relative to the current image region.

Register name	`RegAutoModeRegionWidth`
Register type	IntReg
Access mode	R/W
Unit	Pixels
Address	0x000140F8
Length (Bytes)	4
Bits used	31 .. 0

Possible values	Description
(Camera dependent)	Default (=Maximum height of the sensor)
1	Minimum
(Camera dependent)	Maximum (=Maximum height of the sensor)

RegAutoModeOutliersBright

Number of outliers to discard on the upper (bright) end of the image histogram before calculating exposure adjustments.

Register name	`RegExposureAutoOutliersBright`
Register type	IntReg
Access mode	R/W
Unit	0.01 Percent
Address	0x000140EC
Length (Bytes)	4
Bits used	31..0

Possible values	Description
0	Default
0	Minimum
1000	Maximum

RegAutoModeOutliersDark

Number of outliers to discard on the lower (dark) end of the image histogram before calculating exposure adjustments.

Register name	`RegExposureAutoOutliersDark`
Register type	IntReg
Access mode	R/W
Unit	0.01 Percent
Address	0x000140E8
Length (Bytes)	4
Bits used	31..0

Possible values	Description
0	Default
0	Minimum
1000	Maximum

RegExposureAuto

Automatic exposure mode of the camera.

Register name	`RegExposureAuto`
Register type	IntReg
Access mode	R/W
Address	0x00014104
Length (Bytes)	4
Bits used	31..0

Enumeration values:

Value	Name and description
1	*`Off`* Automatic mode is off
2	*`Continuous`* Auto exposure runs always
3	*`Once`* Auto exposure runs until target is achieved, then `ExposureAuto` returns to *`Off`*.
4	*`other`* Required to set for external level trigger, for example the length of the pulse determines the exposure time.

RegExposureAutoInq...

Register name prefix	`RegExposureAutoInq...`
Register type	MaskedIntReg
Access mode	R
Address	0x00014100
Length (Bytes)	4
Bits used	30 ... 27

Bit assignment:	
Bit	**Name and description**
27	`...other` Contains 1 if `RegExposureAuto` value *`other`* is supported.
28	`...Once` Contains 1 if `RegExposureAuto` value *`Once`* is supported.
29	`...Continuous` Contains 1 if `RegExposureAuto` value *`Continuous`* is supported.
30	`...Off` Contains 1 if `RegExposureAuto` value *`Off`* is supported.

RegExposureValueMin

Shortest exposure duration possible.

Register name	`RegExposureValueMin`
Register type	IntReg
Access mode	R
Unit	Microseconds
Address	0x00014108
Length (Bytes)	4
Bits used	31..0

RegExposureValueMax

Longest exposure duration possible.

Register name	`RegExposureValueMax`
Register type	IntReg
Access mode	R
Unit	Microseconds
Address	0x0001410C
Length (Bytes)	4
Bits used	31..0

RegExposureValue

The exposure duration currently set.

Register name	`RegExposureValue`
Register type	IntReg
Access mode	R/W
Unit	Microseconds
Address	0x00014110
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(Camera dependent)	Default
(Camera dependent)	Minimum, Maximum

RegExposureAutoAdjustTol

Tolerance, allowed from the ideal target value, within which the automatic exposure does not run.

This prevents needless small adjustments from occurring in each image, when the image content changes relatively slowly from frame to frame.

Register name	`RegExposureAutoAdjustTol`
Register type	IntReg
Access mode	R/W
Unit	Percent
Address	0x00014130
Length (Bytes)	4
Bits used	31..0

Possible values	Description
5	Default
(Camera dependent)	Minimum
(Camera dependent)	Maximum

RegExposureAutoAlg

Algorithm used for auto-exposure.

Register name	`RegExposureAutoAlg`
Register type	IntReg
Access mode	R/W
Address	0x00014118
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*Mean* Target a particular mean value of all measured pixels within the `AutoModeRegion` area. The target value itself is set by `ExposureAutoTarget`
1	*FitRange* Adjust the maximum pixel value within the `AutoModeRegion` area to fit the sensor dynamic range.

RegExposureAutoAlgInq...

Registers used to determine the RegExposureAutoAlg values that are supported by the camera.

Register name	`RegExposureAutoAlgInq...`
Register type	IntReg
Access mode	R/W
Address	0x00014114
Length (Bytes)	4
Bits used	31, 30

Enumeration values:	
Value	**Name and description**
31	`...Mean` Contains 1 if `RegExposureAutoAlg` value *`Mean`* is supported.
30	`...FitRange` Contains 1 if `RegExposureAutoAlg` value *`FitRange`* is supported.

RegExposureAutoMin

Minimum automatic exposure value.

Register name	`RegExposureAutoMin`
Register type	IntReg
Access mode	R/W
Unit	Microseconds
Address	0x0001411C
Length (Bytes)	4
Bits used	31..0

Possible values	**Description**
(Camera dependent)	Default, Minimum, Maximum

RegExposureAutoMax

Maximum automatic exposure value.

Register name	`RegExposureAutoMax`
Register type	IntReg
Access mode	R/W
Address	0x00014120
Unit	Microseconds
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(Camera dependent)	Default, Minimum, Maximum

RegExposureAutoTarget

Target image mean value. Higher values result in brighter images. Only valid if `ExposureAutoAlg` is *Mean*.

Register name	`RegExposureAutoTarget`
Register type	IntReg
Access mode	R/W
Unit	Percent
Address	0x00014124
Length (Bytes)	4
Bits used	31..0

Possible values	Description
50	Default
10	Minimum
90	Maximum

RegExposureAutoRate

Rate of exposure adjustments. Use this control to slow down the auto-exposure adjustments.

Register name	`RegExposureAutoRate`
Register type	IntReg
Access mode	R/W
Unit	Percent
Address	0x00014128
Length (Bytes)	4
Bits used	31..0

Possible values	Description
0	Default
1	Minimum (slowest)
100	Maximum (fastest)

RegContrastAuto

Automatic contrast mode of the camera.

Register name	`RegContrastAuto`
Register type	IntReg
Access mode	R/W
Address	0x00014184
Length (Bytes)	4
Bits used	31..30

Enumeration values:	
Value	**Name and description**
0	*Off* Automatic contrast mode is off.
1	*WholeImage* Automatic contrast is calculated for the whole image.
2	*AutoModeRegion* Automatic contrast is calculated for the defined region.

RegContrastAutoInq...

Register name prefix	`RegContrastAutoInq...`
Register type	MaskedIntReg
Access mode	R
Address	0x00014180
Length (Bytes)	4
Bits used	31 ... 29

Bit assignment:	
Bit	**Name and description**
31	`...Off` Contains 1 if `RegContrastAuto` value *`Off`* is supported.
30	`...WholeImage` Contains 1 if `RegContrastAuto` value *`WholeImage`* is supported.
29	`...AutoModeRegion` Contains 1 if `RegContrastAuto` value *`AutoModeRegion`* is supported.

RegContrastAutoIntensityMax

Rate of exposure adjustments. Use this control to slow down the auto-exposure adjustments.

Register name	`RegContrastAutoIntensityMax`
Register type	IntReg
Access mode	R/W
Address	0x0001418C
Unit	Counts
Length (Bytes)	4
Bits used	31..0

Possible values	**Description**
16383	Default
0	Minimum
16383	Maximum

RegContrastAutoIntensityMin

Rate of exposure adjustments. Use this control to slow down the auto-exposure adjustments.

Register name	`RegContrastAutoIntensityMin`
Register type	IntReg
Access mode	R/W
Unit	Counts
Address	0x00014188
Length (Bytes)	4
Bits used	31..0

Possible values	Description
16383	Default
0	Minimum
16383	Maximum

RegIntegrationMode

Set whether the integration interval is allowed to overlap with the readout or not.

Attention:

Other bits at this address are used to control some internal camera settings and should be retained unchanged when writing in this register.

Register name	`RegIntegrationMode`
Register type	MaskedIntReg
Access mode	R/W
Address	0x000B03F0
Length (Bytes)	4
Bits used	31

Enumeration values:	
Value	**Name and description**
0	*`IntegrateWhileRead`* The integration interval is allowed to overlap with the readout
1	*`IntegrateThenRead`* (Default) The integration interval is **not** allowed to overlap with the readout

TriggerControl (subcategory)

In contrast to high level GenICam, trigger selection on GenCP register level needs to be resolved to various control register addresses. The following trigger control registers exist multiple times in an array:

- `RegTriggerMode`,
- `RegSoftwareTrigger`,
- `RegTriggerSource`,
- `RegTriggerEvent`,
- `RegTriggerDelay`.

The actual register address must for the corresponding trigger:

- *`FrameStart`*: The trigger that starts the image (when acquisition is running).
- *`AcquisitionStart`*: The trigger that starts the acquisition process.
- *`AcquisitionEnd`*: The trigger that ends the acquisition process.

Display name	TriggerControl
Origin of functionality	Camera
Control type	(Subcategory)
Category	/AcquisitionControl

RegTriggerEvent[ ]

Signal level for hardware triggers.

Register name	`RegTriggerEvent[]`
Register type	Array of IntReg
Access mode	R/W
Address	0x00013418 for *`FrameStart`* trigger
	0x000134D8 for *`AcquisitionStart`* trigger
	0x00013518 for *`AcquisitionEnd`* trigger
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*`RisingEdge`* (Default) Rising edge trigger
1	*`FallingEdge`* Falling edge trigger
2	*`AnyEdge`* Rising and falling edge
3	*`LevelHigh`* Active high signal
4	*`LevelLow`* Active low signal

RegTriggerEventInq...[ ]

Registers used to determine the trigger activation events that the camera supports.

Register name prefix	`RegTriggerEventInq...[]`
Register type	Array of MaskedIntReg
Access mode	R
Address	0x00013414 for *`FrameStart`* trigger
	0x000134D4 for *`AcquisitionStart`* trigger
	0x00013514 for *`AcquisitionEnd`* trigger
Length (Bytes)	4
Bits used:	31..27

Bit assignment:

Bit	Name and description
27	*`...LevelLow`* If *`1`*, camera supports triggering on low level of signal.
28	*`...LevelHigh`* If *`1`*, camera supports triggering on high level of signal.
29	*`...AnyEdge`* If *`1`*, camera supports triggering on both edges of signal.
30	*`...FallingEdge`* If *`1`*, camera supports triggering on falling edge of signal.
31	*`...RisingEdge`* If *`1`*, camera supports triggering on rising edge of signal.

RegTriggerInq...

Shows which trigger functionalities are supported by the camera.

Register name prefix	`RegTriggerInq...`
Register type	MaskedIntReg
Access mode	R
Address	0x00013400
Length (Bytes)	4
Bits used	31..30

Bit assignment:	
Bit	**Name and description**
30	*...Delay* Contains ***1*** if trigger delay is supported.
31	*...Event* Contains ***1*** if trigger event generation is supported.

RegTriggerDelay[ ]

The actual start of the image capture can be delayed to begin some time after a trigger event is received by the camera. This functionality is valid only when TriggerSource is set to external trigger (i.e. LineIn1, LineIn2). This control functionality is e.g. useful, when syncing with a strobe lighting source, which will inherently have some fixed setup time.

Register name	`RegTriggerDelay[]`
Register type	Array of FloatReg
Access mode	R/W
Unit	Microseconds
Addresses	0x0001341C for *FrameStart* trigger
	0x000134DC for *AcquisitionStart* trigger
	0x0001351C for *AcquisitionEnd* trigger
Length (Bytes)	4
Bits used	31..0

Possible values	**Description**
0	Default
0	Minimum
(Camera dependent)	Maximum

RegTriggerDelayMax

Specifies the maximum delay from hardware trigger activation to trigger effect. This register specifies the maximum value for all existing `RegTriggerDelay[]` registers.

Register name	`RegTriggerDelayMax`
Register type	IntReg
Access mode	R
Unit	Microseconds
Address	0x00013164
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(None)	Default
0	Minimum
(Camera dependent)	Maximum

RegTriggerMode[ ]

Enables or disables the selected trigger.

If `RegTriggerMode[FrameStart]` = *Off* and the FrameStart trigger is selected, images are triggered in *FixedRate* at `AcquisitionFrameRate`.

Register name	`RegTriggerMode[]`
Register type	Array of MaskedIntReg
Access mode	R/W
Addresses	0x00013410 for *FrameStart* trigger
	0x000134D0 for *AcquisitionStart* trigger
	0x00013510 for *AcquisitionEnd* trigger
Length (Bytes)	4
Bits used	0

Enumeration values:	
Value	**Name and description**
0	*Off = Trigger disabled*
1	*On = (Default) Trigger enabled*

RegSoftwareTrigger

This software command triggers an image. Valid if `RegTriggerSource[]` = *`Software`*.

Register name	`RegSoftwareTrigger`
Register type	IntReg
Access mode	R/W
Address	0x00013160
Length (Bytes)	4
Bits used	31..0

RegFixedIntervalMin

Shortest fixed interval time possible, the interval time must not be set below the value stored here.

Register name	`RegFixedIntervalMin`
Register type	IntReg
Access mode	R
Unit	Microseconds
Address	0x00013130
Length (Bytes)	4
Bits used	31..0

RegFixedIntervalMax

Longest fixed interval time possible, the interval time must not exceed the value stored here.

Register name	`RegFixedIntervalMax`
Register type	IntReg
Access mode	R
Unit	Microseconds
Address	0x00013134
Length (Bytes)	4
Bits used	31..0

RegFixedIntervalLimit

Specifies the lower limit for the interval time according to the current settings.

Register name	`RegFixedIntervalLimit`
Register type	IntReg
Access mode	R
Address	0x0001313C
Length (Bytes)	4
Bits used	31..0

RegFixedIntervalValue

Desired fixed interval time. Applies only if `TriggerSource` is switched to *`FixedRate`*. Other settings of the camera, for example exposure time, or bandwidth limitation, may prevent this value from being applied exactly. The camera will then try to get as close to the desired interval time value as possible.

Register name	`RegFixedIntervalValue`
Register type	IntReg
Access mode	R/W
Unit	Microseconds
Address	0x00013138
Length (Bytes)	4

RegTriggerSource[ ]

Source of trigger, when `RegTriggerMode[ ]` is *`On`*. This might be a hardware trigger, a fixed rate generator, or software trigger only.

An acquisition stream must be started in order to trigger or receive frames. For *`Freerun`* and *`FixedRate`* the first frame is synchronized to *`AcquisitionStart`* trigger.

Register name	`RegTriggerSource[]`
Register type	Array of MaskedIntReg
Access mode	R/W
Addresses	0x00013410 for *`FrameStart`* trigger
	0x000134D0 for *`AcquisitionStart`* trigger
	0x00013510 for *`AcquisitionEnd`* trigger
Length (Bytes)	4
Bits used	31..16

Enumeration values:	
Value	**Name and description**
0	*`Freerun`* (Default) Camera runs at maximum supported frame rate depending on the exposure time and ROI size
1	*`Line1`* External trigger Line1
2	*`Line2`* External trigger Line2
5	*`CC1`* (Camera Link models only) from Camera Link frame grabber
6	*`CC2`* (Camera Link models only) from Camera Link frame grabber
7	*`CC3`* (Camera Link models only) from Camera Link frame grabber
8	*`CC4`* (Camera Link models only) from Camera Link frame grabber
9	*`FixedRate`* Camera self-triggers at a fixed frame rate defined by `AcquisitionFrameRate`
10	*`Software`* Software initiated image capture

RegTriggerSourceInq...[ ]

Registers used to determine the external and internal trigger sources that are supported by the camera.

Register name prefix	`RegTriggerSourceInq...[]`
Register type	Array of MaskedIntReg
Access mode	R
Addresses	0x00013408 for *`FrameStart`* trigger
	0x000134C8 for *`AcquisitionStart`* trigger
	0x00013508 for *`AcquisitionEnd`* trigger
Length (Bytes)	4
Bits used	31..25

Bit assignment:	
Bit	**Name and description**
21	*`...Software`* Contains *`1`* if software trigger is supported.
22	*`...FixedRate`* Contains *`1`* if the camera can run without external trigger at a fixed rate specified by `RegFixedIntervalValue`.
23	*`...CC1`* Contains 1 if CC1 is supported
24	*`...CC2`* Contains 1 if CC2 is supported
25	*`...CC3`* Contains 1 if CC3 is supported
26	*`...CC4`* Contains 1 if CC4 is supported
29	*`...Line2`* Contains *`1`* if trigger by Line2 is supported.
30	*`...Line1`* Contains *`1`* if trigger by Line1 is supported.
31	*`...Freerun`* Contains *`1`* if the camera can run without external trigger at maximum speed.

AnalogControl

Controls in this category describe how to control the sensor's analog functionalities.

RegSensorGain

Sets the FPA gain level.

Register name	`RegSensorGain`
Register type	IntReg
Access mode	R/W
Address	0x000B0094
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*Gain0* (Default) Sets FPA gain to lowest level
1	*Gain1* Sets FPA gain to a higher level than Gain0 (if available)
2	*Gain2* Sets FPA gain to a higher level than Gain1 (if available)

RegFPAInqGainX

Determines the gain levels that are supported by the camera.

Register name	`RegFPAInqGainX`
Register type	MaskedIntReg
Access mode	R
Address	0x000B00AC
Length (Bytes)	4
Bits used	31 ..29

Bit assignment:

Bit	Name and description
29	*Gain2* Contains 1 if FPA Gain2 is supported.
30	*Gain1* Contains 1 if FPA Gain1 is supported.
31	*Gain0* Contains 1 if FPA Gain0 is supported.

DeviceControl

Device control functionalities provide general information, control and state of the device (camera) and its sensor. This is for example used to identify the device during the enumeration process.

RegDeviceReset

Register name	`RegDeviceReset`
Register type	IntReg
Access mode	W
Address	0x0000F318
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
1	Write ***1*** to trigger soft reset of camera.

RegDeviceFamilyName

Identifier of the product family of the device.

Register name	`RegDeviceFamilyName`
Register type	StringReg
Access mode	R
Address	0x00000084
Length (Bytes)	64

RegDeviceFirmwareVersion

Firmware version of the device.

Register name	`RegDeviceFirmwareVersion`
Register type	StringReg
Access mode	R
Address	0x000000C4
Length (Bytes)	64

RegHeartbeatTimeoutMS

Controls the current heartbeat timeout of the link.

Register name	`RegHeartbeatTimeoutMs`
Register type	IntReg
Access mode	R/W
Unit	Milliseconds
Address	0x0001E800
Length (Bytes)	4
Bits used	31..0

RegSerialPortBaudRate

Controls the data transmission rate used by the selected serial port. Note that exactly one bit must be set.

Register name	`RegSerialPortBaudRate`
Register type	IntReg
Access mode	R/W
Address	0x0000B004
Length (Bytes)	4
Bits used	31..0

Bit assignment:

Bit	Name and description
0	*Baud9600* If 1, serial port runs at 9.600 bits per second.
1	*Baud19200* If 1, serial port runs at 19.200 bits per second.
2	*Baud38400* If 1, serial port runs at 38.400 bits per second.
3	*Baud57600* If 1, serial port runs at 57.600 bits per second.
4	*Baud115200* If 1, serial port runs at 115.200 bits per second.
5	*Baud230400* If 1, serial port runs at 230.400 bits per second.
6	*Baud460800* If 1, serial port runs at 460.800 bits per second.
7	*Baud921600* If 1, serial port runs at 921.600 bits per second.

RegSerialPortBaudRateInq

Determines the data transmission rates that are supported by the camera.

Register name	`RegSerialPortBaudRateInq`
Register type	IntReg
Access mode	R
Address	0x0000B000
Length (Bytes)	4
Bits used	31..0

Bit assignment:

Bit	Name and description
0	*Baud9600* If 1, serial port can run at 9.600 bits per second.
1	*Baud19200* If 1, serial port can run at 19.200 bits per second.
2	*Baud38400* If 1, serial port can run at 38.400 bits per second.
3	*Baud57600* If 1, serial port can run at 57.600 bits per second.
4	*Baud115200* If 1, serial port can run at 115.200 bits per second.
5	*Baud230400* If 1, serial port can run at 230.400 bits per second.
6	*Baud460800* If 1, serial port can run at 460.800 bits per second.
7	*Baud921600* If 1, serial port can run at 921.600 bits per second.

RegDeviceBaudRateSwitchConfirmTimeout

Timeout for a confirmation write while switching the data transmission rate to a new value. Applies to GenCP link on Camera Link devices. Default is 250 milliseconds according to GenCP standard. When set to 0xFFFFFFFF, the confirmation write requirement is disabled.

Register name	`RegDeviceBaudRateSwitchConfirmTimeout`
Register type	IntReg
Access mode	R/W
Unit	Milliseconds
Address	0x0000B800
Length (Bytes)	4
Bits used	31..0

Possible values	Description
250	Default

RegDeviceManufacturerInfo

Part code and flags of the camera.

Example entry: `Goldeye G-008|4068080|`

Register name	`RegDeviceManufacturerInfo`
Register type	StringReg
Access mode	R
Address	0x00000104
Length (Bytes)	64

RegDeviceModelName

Camera family and model name, such as “Goldeye CL-032“. Software should use the `DevicePartNumber` to distinguish between models.

Register name	`RegDeviceModelName`
Register type	StringReg
Access mode	R
Address	0x00000044
Length (Bytes)	64

RegRelativeHumidity[ ]

Relative humidity, measured at the location selected in `DeviceRelativeHumiditySelector`.

Register name	`RegRelativeHumidity[]`
Register type	Array of FloatReg
Access mode	R
Unit	Percent
Address	0x00024004 for `RelativeHumiditySensor`
	0x00024008 for `RelativeHumiditySensorBoard`
	0x0002400C for `RelativeHumidityMainBoard`
Length (Bytes)	4
Bits used	31..0

RegRelativeHumidityInq...

Determines the location(s) for measuring relative humidity provided by the camera.

Register name prefix	`RegStatusRelativeHumidityInq...`
Register type	IntReg
Access mode	R
Address	0x00024000
Length (Bytes)	4
Bits used	31..29

Bit assignment:

Bit	Name and description
29	*`...MainBoard`* Contains *`1`* if a humidity sensor is present on the camera's mainboard.
30	*`...SensorBoard`* Contains *`1`* if a humidity sensor is present on the camera's sensor board.
31	*`...Sensor`* Contains *`1`* if a humidity sensor is present on the camera's image sensor.

RegDeviceSerialNumber

Serial number of the camera.

Register name	`RegDeviceSerialNumber`
Register type	StringReg
Access mode	R
Address	0x00000144
Length (Bytes)	64

RegTemperature[ ]

Device temperature, measured at the location selected by `DeviceTemperatureSelector`.

Register name	`RegTemperature[]`
Register type	Array of FloatReg
Access mode	R
Unit	Degree Celsius (°C)
Address	0x00024104 for `TemperatureSensor`
	0x00024108 for `TemperatureSensorBoard`
	0x0002410C for `TemperatureMainBoard`
Length (Bytes)	4
Bits used	31..0

RegTemparatureInq...

Determines the supported locations of temperature measurement points provided by the camera.

Register name prefix	`RegTemperatureInq...`
Register type	MaskedIntReg
Access mode	R
Address	0x00024100
Length (Bytes)	4
Bits used	31..29

Bit assignment:	
Bit	**Name and description**
29	*`...MainBoard`* Contains *`1`* if a temperature sensor is present on the camera's mainboard.
30	*`...SensorBoard`* Contains *`1`* if a temperature sensor is present on the camera's sensor board.
31	*`...Sensor`* Contains *`1`* if a temperature sensor is present on the camera's image sensor.

RegDeviceUserID

Used for example for multiple-camera setups for providing meaningful labels to individual cameras.

Register name	`RegDeviceUserID`
Register type	StringReg
Access mode	R/W
Address	0x00000184
Length (Bytes)	64

RegDeviceVendorName

Manufacturer's name: Allied Vision.

Register name	`RegDeviceVendorName`
Register type	StringReg
Access mode	R
Address	0x00000004
Length (Bytes)	64

RegTIDC_Mode

Trigger-induced distortion correction mode.

Register name	`RegTIDC_Mode`
Register type	MaskedIntReg
Access mode	R/W
Address	0x000B00BC
Length (Bytes)	4
Bits used	31..0

Bit assignment:	
Bit	**Name and description**
0	*...Off* No correction is applied.
1	*...LineGlitchOnly* Reduces the effect of the horizontal line.
2	*...BrightnessStep* Levels the brightness above and below the horizontal line.
3	*...BothDistortions* (Default) Applies corrections for both distortions.

RegSensorCoolingPower

Current TEC cooling power consumption. Negative values indicate that the sensor is being heated.

Register name	`RegSensorCoolingPower`
Register type	IntReg
Access mode	R
Unit	Milliwatts
Address	0x000B015C
Length (Bytes)	4
Bits used	31..0

RegSensorTemperatureControlMode

Defines the control mode for the thermo-electric cooler (TEC) of the sensor. If set to `TemperatureControl`, sensor temperature is stabilized to the given setpoint(s)

Register name	`RegSensorTemperatureControlMode`
Register type	IntReg
Access mode	R/W
Address	0x000B0004
Length (Bytes)	4
Default	*`TemperatureControl`*
Bits used	31..0

Enumeration values:

Value	Name and description
0	*`Off`* No sensor temperature control
1	*`TemperatureControl`* Regulates the sensor temperature in accordance with active values of other `SensorTemperature` functionalities
2	*`TemperatureControlTarget`* (Only G/CL-008 models) Regulates the sensor temperature by heating and cooling, aiming to stabilize it at *`SensorTemperatureSetpointValue`* of the activated `SensorTemperatureSetpointActive`. Activates `RegSensorTemperatureTargetSetpoint` that sets the active `SensorTemperatureSetpointActive`

RegSensorTemperatureControlState

Status of the sensor temperature control, which is indicated by the temperature status LED.

Register name	`RegSensorTemperatureControlState`
Register type	IntReg
Access mode	R
Address	0x000B0160
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*`Off`* Sensor cooling is off
1	*`Deviated`* Sensor temperature deviates from the setpoint value
2	*`Stable`* Sensor temperature is stable at the setpoint
3	*`LowerLimit`* Cooling regulator is working at its lower limit
4	*`UpperLimit`* Cooling regulator is working at its upper limit
5	*`Alert`* Camera temperature has reached an overheat protection threshold temperature, the cooling and the sensor are powered off to protect the camera and let it cool down.

RegSensorTemperatureSetpointActivate

Activates the currently selected temperature setpoint, which is represented by `SensorTemperatureSetpointSelector`.

Register name	`RegSensorTemperatureSetpointActivate`
Register type	IntReg
Access mode	W
Address	0x000B0168
Length (Bytes)	4
Bits used	31..0
Value	1

RegSensorTemperatureSetpointActive

TEC active setpoint, it displays the active setpoint.

Register name	`RegSensorTemperatureSetpointActive`
Register type	IntReg
Access mode	R
Address	0x000B0164
Length (Bytes)	4
Bits used	31..0

RegSensorTemperatureSetpointMode

Controls the setpoint mode for the TEC. Allows to set either the manual or automatic selection of setpoints.

Activates the currently selected `SensorTemperatureSetpoint`.

Register name	`RegSensorTemperatureSetpointMode`
Register type	IntReg
Access mode	R/W
Address	0x000B005C
Length (Bytes)	4
Default	*`Auto`*
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*`Manual`* Select the setpoint manually. The active setpoint is presented by `SensorTemperatureSetpointActive` and it can be changed by the following ways • `SensorTemperatureSetpointSelector` and *`SensorTemperatureSetpointActivate`* in succession • `SensorTemperatureTargetSetpoint` in `TemperatureControlTarget` mode.
1	*`Auto`* The setpoint is selected automatically.

RegSensorTemperatureSetpointSelector

TEC setpoint selector, selects the setpoint to be activated.

Only valid if `RegSensorTemperatureSetpointMode` is set to *`Manual`*.

Register name	`RegSensorTemperatureSetpointSelector`
Register type	IntReg
Access mode	R/W
Address	0x000B0154
Length (Bytes)	4
Bits used	31..0

RegSensorTemperatureSetpointValue

The setpoint temperature, corresponding to the setpoint selected by `RegSensorTemperatureSetpointSelector`.

Register name	`RegSensorTemperatureSetpointValue`
Register type	IntReg
Sign	Signed
Access mode	R/W
Unit	Degree Celsius (°C)
Address	0x000B0158
Length (Bytes)	4
Bits used	31..0

RegSensorTemperatureTargetSetpoint

The setpoint that the camera tries to keep, using cooling and heating capabilities, if `RegSensorTemperatureControlMode` is set to *`TemperatureControlTarget`*.

The selected setpoint is automatically activated.

Decrementing to Setpoints lower than *`TargetSetpoint`* by `SetpointMode` *`Auto`* is disabled.

Register name	`RegSensorTemperatureTargetSetpoint`
Register type	IntReg
Availability	Only G/CL-008 models
Sign	Signed
Access mode	R/W
Address	0x000B016C
Length (Bytes)	4
Bits used	31..0

DigitalIOControl

This category includes the digital I/O control functionalities.

RegIoInq...

Defines the presence of Input/Output lines of the camera.

Register name prefix	`RegIoInq...`
Register type	MaskedIntReg
Access mode	R
Address	0x00015000
Length (Bytes)	4
Bits used	31..24

Bit assignment:	
Bit	**Name and description**
19	*...Strobe1* Contains 1 if Strobe1 is supported
20	*...LineOut4* Contains *1*, if **LineOut4** line is supported.
21	*...LineOut3* Contains *1*, if **LineOut3** line is supported.
22	*...LineOut2* Contains *1*, if **LineOut2** line is supported.
23	*...LineOut1* Contains *1*, if **LineOut1** line is supported.
24	*...CC4* Contains 1 if CC4 is supported
25	*...CC3* Contains 1 if CC3 is supported
26	*...CC2* Contains 1 if CC2 is supported
27	*...CC1* Contains 1 if CC1 is supported
28	*...LineIn4* Contains *1*, if **LineIn4** line is supported.
29	*...LineIn3* Contains *1*, if **LineIn3** line is supported
30	*...LineIn2* Contains *1*, if **LineIn2** line is supported.
31	*...LineIn1* Contains *1*, if **LineIn1** line is supported.

RegLineInGlitchFilter[ ]

The register is used to suppress glitches on the `LineIn` input line that is specified by the selected address. The value defines the maximum width of a glitch that can be suppressed.

Setting `RegLineInGlitchFilter[ ]` value causes a latency of *`FrameTrigger`* by the same amount.

Register name	`RegLineInGlitchFilter[]`
Register type	Array of IntReg
Access mode	R/W
Unit	Nanoseconds
Addresses	0x000151D0 for LineIn1
	0x000151D4 for LineIn2
	(Camera Link models only) 0x000151E0 for CC1
	(Camera Link models only) 0x000151E4 for CC2
	(Camera Link models only) 0x000151E8 for CC3
	(Camera Link models only) 0x000151EC for CC4
Length (Bytes)	4
Bits used	31..0

Possible values	Description
0	Default
0	Minimum
50,000	Maximum

RegLineInGlitchFilterMax

Maximum value for `RegLineInGlitchFilter`.

Register name	`RegLineInGlitchFilterMax`
Register type	IntReg
Access mode	R
Unit	Nanoseconds
Address	0x000151C0
Length (Bytes)	4
Bits used	31..0

RegLineInLevels

A register which represents the current state of the available input lines. For example, when this value returns 2 (0010), LineIn2 is high and all other Line input signals are low.

Register name	`RegLineInLevels`
Register type	IntReg
Access mode	R
Address	0x00015110
Length (Bytes)	4
Bits used	31..24

Bit assignment:

Bit	Name and description
31	*LineIn1* Contains *1*, if `LineIn1` line is supported.
30	*LineIn2* Contains *1*, if `LineIn2` line is supported.
27	*CC1* (Camera Link models only) Contains *1*, if `CC1` line is supported.
26	*CC2* (Camera Link models only) Contains *1*, if `CC2` line is supported.
25	*CC3* (Camera Link models only) Contains *1*, if `CC3` line is supported.
24	*CC4* (Camera Link models only) Contains *1*, if `CC4` line is supported.

RegLineOutLevels

Each bit in this register represents the state of the related digital output line when it is configured to operate in GPO mode.

`RegLineOutPolarity[]` also affects the related digital output line when it is configured to GPO mode.

Register name	`RegLineOutLevels`
Register type	IntReg
Access mode	R/W
Address	0x00015114
Length (Bytes)	4
Bits used	31..0

RegLineOutPolarity[ ]

Polarity applied to the `LineOut` that is specified by the selected address.

Register name	`RegLineOutPolarity[]`
Register type	Array of MaskedIntReg
Access mode	R/W
Address	0x00015144 for LineOut1
	0x0001514C for LineOut2
	0x00015154 for LineOut3
Length (Bytes)	4
Bits used	0

Enumeration values:	
Value	**Name and description**
0	*`Normal`* Output signal is not changed.
1	*`Invert`* Output signal is inverted.

RegLineOutSource

Signal source of the `LineOut` that is specified by the selected address.

For detailed information see the camera waveform diagrams provided in the Goldeye G/CL Technical Manuals.

Register name	`RegLineOutSource`
Register type	Array of MaskedIntReg
Access mode	R/W
Address	0x00015144 for LineOut1
	0x0001514C for LineOut2
	0x00015154 for LineOut3
Length (Bytes)	4
Default	*Exposing*
Bits used	31 .. 1

Enumeration values:	
Value	**Name and description**
0	*GPO* General purpose output
1	*AcquisitionTriggerReady* Active once the camera has been recognized by the host computer and is ready to start acquisition
2	*FrameTriggerReady* Active when the camera is in a state that will accept the next frame trigger
4	*Exposing* Active for the duration of sensor exposure
5	*FrameReadout* Active during frame readout, i.e. the transferring of image data from the sensor to camera memory
6	*Imaging* Active when the camera is exposing or reading out frame data
7	*Acquiring* Active when acquisition start has been initiated
8	*LineIn1* Active when there is an external trigger at Line1
9	*LineIn2* Active when there is an external trigger at Line2

Table 16: RegLineOutSource | Values and description (sheet 1 of 2)

Enumeration values:	
Value	**Name and description**
12	*CC1* (Camera Link models only) Active when there is an external trigger at CC1
13	*CC2* (Camera Link models only) Active when there is an external trigger at CC2
14	*CC3* (Camera Link models only) Active when there is an external trigger at CC3
15	*CC4* (Camera Link models only) Active when there is an external trigger at CC4
16	*Strobe1* The output signal is controlled according to Strobe1 settings

Table 16: RegLineOutSource | Values and description (sheet 2 of 2)

StrobeControl (subcategory)

Strobe is an internal signal generator for on-camera clocking functions. Valid when any of the `RegLineOutSource[]` registers is set to *`Strobe1`*. Strobe allows to change the delay and duration of a source signal, which can be useful for example when trying to synchronize a camera exposure to an external signal.

Display name	StrobeControl
Origin of functionality	Camera
Control type	(Subcategory)
Category	/DigitalIOControl

RegStrobe1Delay

Delay from strobe trigger to strobe output.

Register name	`RegStrobe1Delay`
Register type	IntReg
Access mode	R/W
Unit	Microseconds
Address	0x00015178
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(None)	Default
`0`	Minimum
`(Camera dependent)`	Maximum

RegStrobeDelayMax

Maximum delay from strobe trigger to strobe output.

Register name	`RegStrobeDelayMax`
Register type	IntReg
Access mode	R
Unit	Microseconds
Address	0x00015160
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(None)	Default
0	Minimum
(Camera dependent)	Maximum

RegStrobe1Duration

Duration of strobe signal.

Register name	`RegStrobe1Duration`
Register type	IntReg
Access mode	R/W
Unit	Microseconds
Address	0x0001517C
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(None)	Default
0	Minimum
(Camera dependent)	Maximum

RegStrobe1DurationMode

Mode of the strobe timing unit.

Register name	`RegStrobe1DurationMode`
Register type	MaskedIntReg
Access mode	R/W
Address	0x00015174
Length (Bytes)	4
Bits used	0

Enumeration values:	
Value	**Name and description**
0	*`Source`* Strobe duration is the same as source duration
1	*`Controlled`* Strobe duration is defined by `RegStrobe1Duration`

RegStrobe1Source

Associates the start of strobe signal with one of the following signals:

For detailed information see the camera waveform diagrams provided in the Goldeye G/CL Technical Manual.

Register name	`RegStrobe1Source`
Register type	MaskedIntReg
Access mode	R/W
Address	0x00015144
Length (Bytes)	4
Bits used	31 .. 1

Enumeration values:

Value	Name and description
1	*AcquisitionTriggerReady* Active once the camera has been recognized by the host computer and is ready to start acquisition
2	*FrameTriggerReady* Active when the camera is in a state that will accept the next frame trigger
3	*FrameTrigger* Active when an image has been initiated to start. This is the logic trigger signal inside of the camera. It is initiated by an external trigger or software trigger.
4	*Exposing* Active for the duration of sensor exposure.
5	*FrameReadout* Active during frame readout, i.e. the transferring of image data from the sensor to camera memory.
7	*Acquiring* Active when acquisition start has been initiated.
8	*LineIn1* Active when there is an external trigger at Line1.
9	*LineIn2* Active when there is an external trigger at Line2.

FileAccessControl

Contains the functionalities related to the file system that provides all the services necessary for generic file access of a device.

RegFileAccessBuffer

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

Register name	`RegFileAccessBuffer`
Register type	Register
Access mode	R/W
Address	0x000F0200
Length (Bytes)	RegFileAccessBufferSizeInBytes
Bits used	31..0

RegFileAccessBufferSizeInBytes

Represents the size of the `FileAccessBuffer`.

Register name	`RegFileAccessBufferSizeInBytes`
Register type	IntReg
Access mode	R
Unit	Bytes
Address	0x000F0084
Length (Bytes)	4
Bits used	31..0

RegFileSystemBlockSizeInBytes

Represents the block size of the file system.

Register name	`RegFileSystemBlockSizeInBytes`
Register type	IntReg
Access mode	R
Unit	Bytes
Address	0x000F0088
Length (Bytes)	4
Bits used	31..0

RegFileSystemTotalBlocks

Represents the total number of blocks in the file system.

Register name	`RegFileSystemTotalBlocks`
Register type	IntReg
Access mode	R
Address	0x000F008C
Length (Bytes)	4
Bits used	31..0

RegFileSystemFreeBlocks

Represents the number of free blocks in the file system.

Register name	`RegFileSystemFreeBlocks`
Register type	IntReg
Access mode	R
Address	0x000F0090
Length (Bytes)	4
Bits used	31..0

RegFileAccessLength

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

Register name	`RegFileAccessLength`
Register type	IntReg
Access mode	R/W
Unit	Bytes
Address	0x000F0020
Length (Bytes)	4
Bits used	31..0

RegFileAccessOffset

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

Register name	`RegFileAccessOffset`
Register type	IntReg
Access mode	R
Unit	Bytes
Address	0x000F001C
Length (Bytes)	4
Bits used	31..0

RegFileDescription

Represents the description of the file selected by `FileSelector`. A maximum of 32 characters is allowed, including the trailing null character.

Register name	`RegFileDescription`
Register type	`StringReg`
Access mode	R
Address	0x000F0040
Length (Bytes)	32

RegFileDescriptionBuffer

Contains the description that will be used for newly created files or if the description of an existing file is changed. A maximum of 32 characters is allowed, including the trailing null character.

Register name	`RegFileDescriptionBuffer`
Register type	StringReg
Access mode	R
Address	0x000F0060
Length (Bytes)	32
Bits used	31..0

RegFileOpenMode

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

Register name	`RegFileOpenMode`
Register type	IntReg
Access mode	R/W
Address	0x000F000C
Default	*`Read`*
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*`Read`* Selects read-only open mode
1	*`Write`* Selects write-only open mode

RegFileOperationExecute

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

Register name	`RegFileOperationExecute`
Register type	IntReg
Access mode	W
Address	0x000F0008
Length (Bytes)	4
Bits used	31..0

RegFileOperationResult

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

Register name	`RegFileOperationResult`
Register type	IntReg
Access mode	R
Unit	Bytes
Address	0x000F0014
Length (Bytes)	4
Bits used	31..0

RegFileAttributeBuffer

Contains the attribute that is to be used for newly created files or when the attribute of an existing file is changed.

Register name	`RegFileAttributeBuffer`
Register type	IntReg
Access mode	R/W
Unit	Bytes
Address	0x000F0030
Length (Bytes)	4
Bits used	31..0

RegFileOperationSelector

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

Register name	`RegFileOperationSelector`
Register type	IntReg
Access mode	R/W
Address	0x000F0004
Length (Bytes)	4
Default	*Open*
Bits used	31..0

Enumeration values:

Value	Name and description
0	*Open* Opens the file selected by `FileSelector` in the device with the access mode selected in `FileOpenMode`.
1	*Close* Closes the file selected by `FileSelector` in the device.
2	*Read* Reads `FileAccessLength` bytes from the file selected by FileSelector. The file must have been opened for reading before this operation can be executed. The data is read from the file position defined by `FileAccessOffset` and it is stored in the `FileAccessBuffer`.
3	*Write* Writes *FileAccessLength* bytes from the `FileAccessBuffer` to the file selected by `FileSelector`. The file must have been opened for writing before this operation can be executed. The data is written to the file position defined by `FileAccessOffset`.
4	*Delete* Deletes the file selected by `FileSelector` in the device. Note: Deleting a device file does not remove the associated `FileSelector` entry to allow future operation on this file.
5	*WriteType* Changes the type of the file selected by `FileSelector` to the type defined by `FileTypeBuffer`.
6	*WriteAttribute* Changes the attribute of the file selected by `FileSelector` to the attribute defined by `FileAttributeBuffer`.
7	*WriteDescription* Changes the description of the file selected by `FileSelector` to the type defined by `FileDescriptionBuffer`

RegFileOperationStatus

Shows the status of file operation execution.

Register name	`RegFileOperationStatus`
Register type	IntReg
Access mode	R
Address	0x000F0010
Length (Bytes)	4
Bits used	31..0

Enumeration values:

Value	Name and description
0	*Success* The last file operation was successful.
1	*Failure* The last file operation failed.

RegFileSelector

Selects the target file in the device. The entries of this enumeration define the names of all files in the device that can be accessed via file access. The file slots can be used arbitrarily.

Reserved file names

There is a number of file slots that are reserved for special purposes. Those file names cannot be used.

Therefore, use only the file slots named below. Using different file names may render the camera unusable!

Register name	`RegFileSelector`
Register type	IntReg
Access mode	R/W
Address	0x000F0000
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
1	*`UserData`* Use this name to access the first user file slot.
2	*`UserData2`* Use this name to access the second user file slot.
3	*`UserData3`* Use this name to access the third user file slot.
4	*`UserData4`* Use this name to access the fourth user file slot.

Table 17:

RegFileSize

Represents the size of the selected file.

Register name	`RegFileSize`
Register type	IntReg
Access mode	R
Unit	Bytes
Address	0x000F0018
Length (Bytes)	4
Bits used	31..0

RegFileStatus

Represents the status of the file.

Register name	`RegFileStatus`
Register type	IntReg
Access mode	R
Address	0x000F0080
Length (Bytes)	4
Bits used	31..0

Bit assignment:	
Bit	**Name and description**
31	*`RegIsFileSystemReady`* Contains *`1`* if the file system is ready to use
30	*`RegDoesFileExist`* Contains *`1`* if the currently selected file exists
29	*`RegIsFileOpen`* Contains 1 if the currently selected file is open
28	*`RegIsReadFile`* Contains *`1`* if the currently selected file can be read
27	*`RegIsWriteFile`* Contains *`1`* if the currently selected file can be written
26	*`RegCanOpenFile`* Contains *`1`* if the currently selected file can be opened
25	*`RegCanDeleteFile`* Contains *`1`* if the currently selected file can be deleted

Table 18: RegFileStatus | Values and description (sheet 1 of 2)

Bit assignment:	
Bit	**Name and description**
24	*RegCanChangeFileTypeAndDescription* Contains *1* if the type and description of the currently selected file can be changed.
23	*RegCanChangeFileAttribute* Contains *1* if the attribute of the currently selected file can be changed

Table 18: RegFileStatus | Values and description (sheet 2 of 2)

RegFileType

Type of currently selected file.

Register name	`RegFileType`
Register type	IntReg
Access mode	R
Address	0x000F0024
Length (Bytes)	4
Bits used	31..0

RegFileTypeBuffer

Contains the type that will be used for newly created files or when the type of an existing file is changed.

Register name	`RegFileTypeBuffer`
Register type	IntReg
Access mode	R/W
Address	0x000F0028
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0x00001000	Type is used for Non-Uniformity Correction data
0x00002000	Type is used for Defect Pixel Correction data

ImageCorrectionControl

Image corrections for SWIR sensors.

The corrections applied to the image are of special relevance within the Goldeye camera. They are applied by the following modules.

- Background Correction (BC)
- Non-Uniformity Correction (NUC)
- Defect Pixel Correction (DPC)

The corrections need special correction data that must be provided prior to operating the image processing chain.

BackgroundCorrection (subcategory)

The background correction is used as an additional correction, based on actual operating conditions, to optimize the result of the non-uniformity correction.

This category contains functionalities that allow to control the background correction.

Display name	BackgroundCorrection
Origin of functionality	Camera
Control type	(Subcategory)
Category	/ImageCorrectionControl

RegBCDatasetMeanValue

Returns the mean value of the correction image.

Register name	`RegBCDatasetMeanValue`
Register type	IntReg
Access mode	R
Address	0x00090494
Length (Bytes)	4
Bits used	31..0

RegBCDatasetOffsetValue

Setpoint value of the data set. Specifies the output offset of the corrected image. The scale is always based on the maximum pixel depth the camera supports, independent of the active output pixel format.

The offset value is added after subtraction of the correction image. If set to the mean value of the correction image, the background correction operates without an output level shift.

Register name	`RegBCDatasetOffsetValue`
Register type	IntReg
Sign	Signed
Access mode	R/W
Address	0x00090498
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(None)	Default
-32768	Minimum
32768	Maximum

RegBCIntegrationAbort, RegBCIntegrationStart

`BCIntegrationAbort` aborts a running integration as soon as possible. The correction buffer will be invalid if lesser number of frames have been integrated than requested.

`BCIntegrationStart` starts the integration of `BCIntegrationFrameCount` frames, depending on `BCIntegrationMode`. This command does not control the triggering of images for the integration, it only enables the integration process.

Background correction will wait after `BCIntegrationStart`, until `BCIntegrationFrameCount` frames have been produced by the camera. Frame triggering is not in the background correction domain. This is controlled by functionalities such as `ExposureTime`, `AcquisitionStart`, `AcquisitionStop`, `TriggerSource`, `TriggerSelector`, or `AcquisitionFrameRate`.

If the camera does not output images for some reason, background correction integration will stall until AcquisitionStart is executed and frame triggering is allowed by the trigger setup.

For optimal correction results:

1. Configure the settings you intend to use for your application.
2. Integrate a fresh background correction image without light (dark image) using these settings.
3. Finally, apply the background correction.

RegBCIntegrationControl

Register name	`RegBCIntegrationControl`
Register type	MaskedIntReg
Access mode	W
Address	0x000904B8
Length (Bytes)	4

Enumeration values:	
Value	**Name and description**
1	*`BCIntegrationStart`* Start the integration of `BCIntegrationFrameCount` frames, depending on `BCIntegrationMode`. Note that the camera needs to produce frames in order to integrate, thus the acquisition has to be started.
2	*`BCIntegrationAbort`* Abort a running integration as soon as possible. The correction buffer will be invalid if less frames have been integrated than requested.

RegBCIntegrationFrameCount

Number of frames to integrate after `BCIntegrationStart` command. Integrating more images improves the correction quality because influence of dynamic noise on the correction image is reduced. `BCIntegrationFrameCount` is always rounded off to the next power of two.

Register name	`RegBCIntegrationFrameCount`
Register type	IntReg
Access mode	R/W
Unit	Frames
Address	0x000904B4
Length (Bytes)	4
Bits used	31..0

Possible values	**Description**
1	Default
1	Minimum
4	Maximum

RegBCIntegrationMode

Controls how a background correction image will be acquired upon `BCIntegrationStart` command.

Register name	`RegBCIntegrationMode`
Register type	MaskedIntReg
Access mode	R/W
Address	0x000904B0
Length (Bytes)	4
Default	*`Integrate`*
Bits used	31..30

Enumeration values:	
Value	**Name and description**
0	*`Integrate`* After `BCIntegrationStart`, a correction image that is the mean of `BCIntegrationFrameCount` images will be acquired.
1	*`FrameBuffer`* Stores every frame to the correction memory and uses the previously stored image for correction. If `BCMode` = *`On`*, this can be used to get a dynamic frame-to-frame difference of the live image. Use `BCIntegrationStart` to start the FrameBuffer writing, set `BCIntegrationMode` = *`Integrate`* to stop it.

RegBCMode

Controls the operating mode of the background correction. Different modes may be available, depending on the previously integrated corrected data.

Register name	`RegBCMode`
Register type	MaskedIntReg
Access mode	R/W
Address	0x00090400
Length (Bytes)	4
Bits used	31..28

Enumeration values:	
Value	**Name and description**
0	*`Off`* Image data is passed through unchanged.
1	*`On`* Uses a previously integrated reference image for subtraction.
2	*`OffsetOnly`* Can be used as general purpose level shift.
3	*`ReferenceImage`* For testing purposes. By selecting this option, the background correction will become an image source.

RegBCInq

Operation mode of the background correction. It contains *`1`*, if the camera supports background correction functionalities.

Register name	`RegBCInq`
Register type	MaskedIntReg
Access mode	R/W
Address	0x00090400
Length (Bytes)	4
Bits used	0

Enumeration values:	
Value	**Name and description**
0	Camera does not support background correction functionalities.
1	Camera supports background correction functionalities.

RegBCDatasetCount

Number of background correction datasets stored.

Register name	`RegBCDatasetCount`
Register type	IntReg
Access mode	R
Address	0x00090408
Length (Bytes)	4
Bits used	31..0

RegBCState

Shows the current state of the background correction processing. If the state is Ok then the BC is operating normally as configured with `BCMode`, otherwise the ROI settings might be out of range, a new integration might be needed or is still in progress.

Register name	`RegBCState`
Register type	IntReg
Access mode	R
Address	0x000904BC
Length (Bytes)	4
Bits used	31..0

Enumeration values:

Value	Name and description
0	*`Ok`* Correction operates normally.
1	*`DatasetInvalid`* The current data set is not valid. Select a different data set, start a new integration or wait until the current integration has finished.
2	*`ROIOutOfBounds`* The current data set is valid, but at least one of the ROI settings has left the data set's ROI. Change `Height`, `Width`, `OffsetX` or `OffsetY` accordingly, select a different data set or start a new integration.

RegBCIntegrationValid

Defines, if a background image was recorded and is available in the camera so the background correction can be applied.

Register name	`RegBCIntegrationValid`
Register type	IntReg
Access mode	R
Address	0x000904C0
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	The most recently started integration process hasn‘t been completed yet or was unsuccessful.
1	The most recently started integration process is done and was successful.

DefectPixelCorrection (subcategory)

The pixels of InGaAs sensors may show abnormal behavior in dark offset, photo response, or dynamic noise, respectively. The result is an excessively reduced dynamic range. These pixels are counted as defect pixels.

This category handles all functionalities necessary to apply the defect pixel correction (DPC). Refer to the Goldeye G/CL Technical Manual for a description of how the defect pixel correction is applied.

Display name	AutoModeParameters
Origin of functionality	Camera
Control type	(Subcategory)
Category	/ImageCorrectionControl

RegDPCDatasetActive

The index of the active data set, starting at 0. Writing to this register changes the active data set, meaning it activates the data set indexed.

The maximum value allowed depends on the number of valid data sets in the camera and is reported by `RegDPCDatasetCount`. The mapping of an index value to a specific correction data file may vary from camera to camera or after correction data modifications.

Use `RegDPCDatasetSelector` and corresponding functionalities to retrieve more information about the data sets.

Register name	`RegDPCDatasetActive`
Register type	IntReg
Access mode	R/W
Address	0x00090204
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(Camera dependent)	Default
0	Minimum
(Camera dependent)	Maximum

RegDPCDatasetActiveDescription

Gives a short descriptive label to the data set that is currently active and indexed by `DPCDatasetActive`.

Register name	`RegDPCDatasetActiveDescription`
Register type	StringReg
Access mode	R
Address	0x00090224
Length (Bytes)	32

RegDPCDatasetDescription

Gives a short descriptive label to the data set that is currently indexed by `DPCDatasetSelector`.

Register name	`RegDPCDatasetDescription`
Register type	StringReg
Access mode	R
Address	0x00090258
Length (Bytes)	32

RegDPCDatasetSelector

Selects a data set for access. The maximum possible value of `DPCDatasetSelector` depends on the number of valid data sets in the camera. The mapping of an index value to a specific correction data file may vary from camera to camera or after correction data modifications.

Register name	`RegDPCDatasetSelector`
Register type	IntReg
Access mode	R/W
Address	0x00090244
Length (Bytes)	4
Bits used	31..0

RegDPCMode

Configures operation mode of the defect pixel correction.

Register name	`RegDPCMode`
Register type	MaskedIntReg
Access mode	R/W
Address	0x00090200
Length (Bytes)	4
Bits used	31..28

Enumeration values:	
Value	**Name and description**
0	*Off* Image data is passed through unchanged.
1	*On* Defects are replaced by a value calculated from surrounding non-defective neighbors.

RegDPCInq

Determines whether DPC datasets are applied to the images.

Register name	`RegDPCInq`
Register type	MaskedIntReg
Access mode	R/W
Address	0x00090200
Length (Bytes)	4
Bits used	0

Enumeration values:	
Value	**Name and description**
0	Camera does not support defect pixel correction functionalities
1	Camera supports defect pixel correction functionalities.

RegDPCDatasetCount

The number of available DPC datasets in the camera.

Register name	`RegDPCDatasetCount`
Register type	IntReg
Access mode	R
Address	0x00090208
Length (Bytes)	4
Bits used	31..0
Default	Camera dependent

Possible values	Description
(None)	Default
0	Minimum
(Camera dependent)	Maximum

NonUniformityCorrection (subcategory)

Every pixel of an InGaAs sensor possesses its individual amount of dark signal and an individual sensitivity for light. Thus, while exposing, each sensor creates a specific, non-uniform underlying pattern. This pattern can be compensated with help of the non-uniformity correction.

This category contains functionalities that allow to control the non-uniformity correction.

Display name	NonUniformityCorrection
Origin of functionality	Camera
Control type	(Subcategory)
Category	/ImageCorrectionControl

RegNUCDatasetActive

The index of the active data set, starting at 0. Writing to this register changes the active data set, meaning it activates the data set indexed.

The maximum value allowed depends on the number of valid data sets in the camera and is reported by `RegNUCDatasetCount`. The mapping of an index value to a specific correction data file may vary from camera to camera or after correction data modifications.

Use `RegNUCDatasetSelector` and corresponding functionalities to retrieve more information about the data sets.

Register name	`RegNUCDatasetActive`
Register type	IntReg
Access mode	R/W
Address	0x00090004
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(None)	Default
0	Minimum
(Camera dependent)	Maximum

RegNUCDatasetActiveDescription

Gives a short descriptive label to the data set that is currently indexed by `RegNUCDatasetActive`. For example: Gain 0, 15.000 °C, 1000 µs.

This text is intended for informational purposes in the user interface display only!

For the actual values refer to `NUCDatasetActiveExposureTime`, `NUCDatasetActiveGain`, and `NUCDatasetActiveTemperature`

Register name	`NUCDatasetActiveDescription`
Register type	StringReg
Access mode	R
Address	0x00090024
Length (Bytes)	32

RegNUCDatasetActiveExposureTime

Shows exposure time at acquisition of the data set that is currently indexed by `RegNUCDatasetActive`. The data set should be selected so that the actual exposure time setting corresponds to the reference value.

The number of distinct reference values is limited by available correction data, depending on the camera model.

Register name	`RegNUCDatasetActiveExposureTime`
Register type	IntReg
Access mode	R
Address	0x0009001C
Length (Bytes)	4
Bits used	31..0

RegNUCDatasetActiveGain

`SensorGain` setting at acquisition of the data set that is currently indexed by `RegNUCDatasetActive`. The data set should be selected so that the actual sensor gain setting corresponds to the reference value.

The number of distinct reference values is limited by available correction data, depending on the camera model.

Register name	`RegNUCDatasetActiveGain`
Register type	IntReg
Access mode	R
Address	0x00090018
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*`Gain0`* SensorGain = Gain0
1	*`Gain1`* SensorGain = Gain1
2	*`Gain2`* SensorGain = Gain2

RegNUCDatasetActiveTemperature

Shows sensor temperature at acquisition of the data set that is currently indexed by `RegNUCDatasetActive`. The data set should be selected so that the actual sensor temperature is close to the reference temperature.

The number of distinct reference values is limited by available correction data, depending on the camera model.

Register name	`RegNUCDatasetActiveTemperature`
Register type	FloatReg
Access mode	R
Address	0x00090014
Length (Bytes)	4
Bits used	31..0
Units	Degree Celsius (°C)

RegNUCDatasetAuto

Controls automatic selection of the `RegNUCDatasetActive`.

Register name	`RegNUCDatasetAuto`
Register type	IntReg
Access mode	R/W
Address	0x00090010
Length (Bytes)	4
Default	*`Off`*
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*`Off`* The automatic mode is off
1	*`Once`* Auto-NUC occurs until target is achieved, then NUCDatasetAuto returns to Off
2	*`Continuous`* The non-uniformity correction will continue according to the scene illumination

RegNUCDatasetDescription

Description of the data set indexed by `RegNUCDatasetSelector`.

Register name	`RegNUCDatasetDescription`
Register type	StringReg
Access mode	R
Address	0x00090058
Length (Bytes)	32

RegNUCDatasetExposureTime

Shows the exposure time at acquisition of the data set indexed by `RegNUCDatasetSelector`. The data set should be selected so that the actual exposure time setting corresponds to the reference value.

Register name	`RegNUCDatasetActiveExposureTime`
Register type	IntReg
Access mode	R
Address	0x90050
Length (Bytes)	4
Bits used	31..0

RegNUCDatasetGain

`SensorGain` setting at acquisition of the data set indexed by `RegNUCDatasetSelector`. The data set should be selected so that the actual sensor gain setting corresponds to the reference value.

The number of distinct reference values is limited by available correction data, depending on the camera model.

Register name	`RegNUCDatasetGain`
Register type	IntReg
Access mode	R
Address	0x0009004C
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*`Gain0`* SensorGain = Gain0
1	*`Gain1`* SensorGain = Gain1
2	*`Gain2`* SensorGain = Gain2

RegNUCDatasetNodeSelector

Selects a data point of a data set to access its properties, starting at 0. The maximum possible value depends on the number of valid data points in the data set.

Register name	`RegNUCDatasetNodeSelector`
Register type	IntReg
Access mode	R/W
Address	0x00090078
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(None)	Default
0	Minimum
(Camera dependent)	Maximum

RegNUCDatasetNodeCount

Number of nodes stored in the current NUC data set.

Register name	`RegNUCDatasetNodeCount`
Register type	IntReg
Access mode	R
Address	0x0009007C
Length (Bytes)	4
Bits used	31..0

RegNUCDatasetNodeValue

Setpoint value of the selected data point indexed by `RegNUCDatasetNodeSelector`. The setpoint defines the mean value which the corrected image will have if the input image has a mean value of the corresponding correction data image. The value equals the maximum output bit depth of the camera.

Register name	`RegNUCDatasetNodeValue`
Register type	IntReg
Access mode	R/W
Address	0x00090080
Length (Bytes)	4
Bits used	31..0

RegNUCDatasetSelector

Selects a data set for access. The maximum possible value depends on the number of valid data sets in the camera. The mapping of an index value to a specific correction data file may vary from camera to camera or after correction data modifications.

Register name	`RegNUCDatasetSelector`
Register type	IntReg
Access mode	R/W
Address	0x00090044
Length (Bytes)	4
Bits used	31..0
Default	(Camera dependent)

Possible values	Description
(None)	Default
0	Minimum
(Camera dependent)	Maximum

RegFloatRegNUCDatasetTemperature

Sensor temperature, at acquisition of the data set indexed by Reg`NUCDatasetSelector`. The data set should be selected so that the actual sensor temperature is close to the reference temperature.

The number of distinct reference values is limited by available correction data, depending on the camera model.

Register name	`RegFloatRegNUCDatasetTemperature`
Register type	FloatReg
Access mode	R
Unit	Degree Celsius (°C)
Address	0x00090048
Length (Bytes)	4
Bits used	31..0

RegNUCMode

Controls the operating mode of the non-uniformity correction. Depending on the factory-provided correction data, different modes may be available.

Register name	`RegNUCMode`
Register type	MaskedIntReg
Access mode	R/W
Address	0x00090000
Length (Bytes)	4
Bits used	31..28

Enumeration values:	
Value	**Name and description**
0	*`Off`* Image data is passed through unchanged.
1	*`TwoPoint`* Uses a dark reference image and a bright reference image to calculate offset and gain for each pixel and correct the non-uniformity accordingly.

RegNUCInq

Determines whether the camera supports non-uniformity correction functionalities.

Register name	`RegNUCInq`
Register type	MaskedIntReg
Access mode	R
Address	0x00090000
Length (Bytes)	4
Bits used	0

Enumeration values:	
Value	**Name and description**
0	The camera does not support non-uniformity correction functionalities.
1	The camera supports non-uniformity correction functionalities.

RegNUCDatasetCount

The number of available NUC datasets in the camera.

Register name	`RegNUCDatasetCount`
Register type	IntReg
Access mode	R
Address	0x00090008
Length (Bytes)	4
Bits used	31..0

Possible values	**Description**
(None)	Default
0	Minimum
(Camera dependent)	Maximum

ImageFormatControl

This category describes how to influence and determine the image size and resolution. It assumes that the device generates a single rectangular image and allows for only one ROI. The necessary additional information on these properties is provided as well.

RegImageModeInq...

Registers used to determine whether the camera supports horizontal binning or vertical binning respectively.

Binning is the summing of charge or gray value of adjacent pixels on the sensor. This generates a lower resolution image, but also causes an increase of the camera sensitivity, which will grow proportionally to the number of binned pixels.

Register name prefix	`RegImageModeInq...`
Register type	MaskedIntReg
Access mode	R
Address	0x00011000
Length (Bytes)	4
Bits used	31..0

Bit assignment:	
Bit	**Name and description**
30	*`...BinningY`* If *1*, camera supports vertical binning.
31	*`...BinningX`* If *1*, camera supports horizontal binning.

Table 19:

RegBinningXValue

The horizontal binning factor. Changing this value may affect the effective ROI size and position. Horizontal and vertical binning can be adjusted separately.

Register name	`RegBinningXValue`
Register type	IntReg
Access mode	R/W
Address	0x00011108
Length (Bytes)	4
Bits used	31..0

Possible values	Description
1	Default
1	Minimum
(Camera dependent)	Maximum

RegBinningXMax

Maximum supported horizontal binning value.

Register name	`RegBinningXMax`
Register type	IntReg
Access mode	R
Address	0x00011104
Length (Bytes)	4
Bits used	31..0

RegBinningYValue

The vertical binning factor. Changing this value may affect the effective ROI size and position. Horizontal and vertical binning can be adjusted separately.

Register name	`RegBinningYValue`
Register type	IntReg
Access mode	R/W
Address	0x00011128
Length (Bytes)	4
Bits used	31..0

Possible values	Description
1	Default
(Camera dependent)	Minimum, Maximum

RegBinningYMax

Maximum supported vertical binning value

Register name	`RegBinningYMax`
Register type	IntReg
Access mode	R
Address	0x00011124
Length (Bytes)	4
Bits used	31..0

RegHeight

Height of image, in pixels.

Register name	`RegHeight`
Register type	IntReg
Access mode	R/W
Address	0x00012128
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(Camera dependent)	Default
(Camera dependent)	Minimum, Maximum

Table 20:

RegHeightMax

Maximum image height for the current image mode.

Register name	`RegHeightMax`
Register type	IntReg
Access mode	R
Address	0x00012114
Length (Bytes)	4
Bits used	31..0

RegImageSize

Size of images, for the current format and size.

Register name	`RegImageSize`
Register type	IntReg
Access mode	R
Unit	Bytes
Address	0x00012200
Length (Bytes)	4
Bits used	31..0

RegRegionX

Horizontal offset: starting column of the readout region (relative to the first column of the sensor) in pixels.

Register name	`RegRegionX`
Register type	IntReg
Access mode	R/W
Address	0x0001212C
Length (Bytes)	4
Bits used	31..0

Possible values	Description
0	Default
0	Minimum
(Camera dependent)	Maximum

RegMinWidth

Minimum supported AOI width.

Register name	`RegMinWidth`
Register type	IntReg
Access mode	R
Address	0x0001213C
Length (Bytes)	4
Bits used	31..0

RegWidthInc

Reports the AOI width granularity.

Register name	`RegWidthInc`
Register type	IntReg
Access mode	R
Address	0x00012140
Length (Bytes)	4
Bits used	31..0

RegMaxRegionX

Maximum AOI x-axis start position.

Register name	`RegMaxRegionX`
Register type	IntReg
Access mode	R
Address	0x0001214C
Length (Bytes)	4
Bits used	31..0

RegRegionY

Vertical offset: starting row of the readout region (relative to the first row of the sensor) in pixels.

Register name	`RegRegionY`
Register type	IntReg
Access mode	R/W
Address	0x00012130
Length (Bytes)	4
Bits used	31..0

Possible values	Description
0	Default
0	Minimum
(Camera dependent)	Maximum

RegMinHeight

Minimum supported AOI height.

Register name	`RegMinHeight`
Register type	IntReg
Access mode	R
Address	0x00012144
Length (Bytes)	4
Bits used	31..0

RegHeightInc

AOI height granularity.

Register name	`RegHeightInc`
Register type	IntReg
Access mode	R
Address	0x00012148
Length (Bytes)	4
Bits used	31..0

RegMaxRegionY

Maximum AOI y-axis start position.

Register name	`RegMaxRegionY`
Register type	IntReg
Access mode	R
Address	0x00012150
Length (Bytes)	4
Bits used	31..0

RegPixelFormat

There are various pixel data formats that Goldeye Camera Link models can output. Not all models have every mode (see the Goldeye G/CL Technical Manuals for details).

Register name	`RegPixelFormat`
Register type	IntReg
Access mode	R/W
Address	0x00012120
Length (Bytes)	4
Bits used	31..0

Enumeration values:

Value	Name and description
17301505	*Mono8* Bit depth: 8. One pixel every byte. Monochrome.
17825797	*Mono12* Bit depth: 12. One pixel every two bytes, LSB aligned. Monochrome.
17825829	*Mono14* Bit depth: 14. One pixel every two bytes, LSB aligned. Monochrome.

RegPixelFormatInq...

Registers used to determine the pixel format supported by the camera.

Register name prefix	`RegPixelFormatInq...`
Register type	MaskedIntReg
Access mode	R
Address	0x00012100
Length (Bytes)	4
Bits used	31..0

Bit assignment:	
Bit	**Name and description**
26	*...Mono12* If *1*, camera supports Mono12 pixel format.
30	*...Mono8* If *1*, camera supports Mono8 pixel format.

Register name prefix	`RegPixelFormatInq...`
Register type	MaskedIntReg
Access mode	R
Address	0x00012104
Length (Bytes)	4
Bits used	31..0

Bit assignment:	
Bit	**Name and description**
26	*...Mono14* If *1*, camera supports Mono14 pixel format.

RegSensorBits

Maximum bit depth of the sensor.

Register name	`RegSensorBits`
Register type	MaskedIntReg
Access mode	R
Address	0x00011020
Length (Bytes)	4
Used Bits	23..16

RegSensorHeight

The total number of pixel rows on the sensor.

Register name	`RegSensorHeight`
Register type	IntReg
Access mode	R/C
Address	0x00011028
Length (Bytes)	4
Bits used	31..0

RegSensorType

Type of image sensor.

Register name	`RegSensorType`
Register type	MaskedIntReg
Access mode	R
Address	0x00011020
Length (Bytes)	4
Bits used	31..24

Enumeration values:	
Value	**Name and description**
0	Monochrome
1	(Not used)

RegSensorWidth

The total number of pixel columns on the sensor.

Register name	`RegSensorWidth`
Register type	IntReg
Access mode	R
Address	0x00011024
Length (Bytes)	4
Bits used	31..0

RegWidth

Width of image, in pixels.

Register name	`RegWidth`
Register type	IntReg
Access mode	R/W
Address	0x00012124
Length (Bytes)	4
Bits used	31..0

Possible values	Description
(Camera dependent)	Default
(Camera dependent)	Minimum, Maximum

RegWidthMax

Maximum image width for the current image mode. Horizontal binning, for example, will change this value.

Register name	`RegMaxWidth`
Register type	IntReg
Access mode	R
Address	0x00012110
Length (Bytes)	4
Bits used	31..0

TransportLayerControl

This category contains the functionalities related to transport layer control

RegClClockFrequency

Allows to change the clock frequency of the Camera Link backend.

Higher values allow higher bandwidths, lower values reduce bit error problems with longer cables.

Register name	`RegClClockFrequency`
Register type	IntReg
Access mode	R/W
Unit	Hertz
Address	0x000C0000
Length (Bytes)	4
Bits used	31..0

Possible values	Description
Minimum	25 000 000
Maximum	40 000 000 (CL-008 and CL-032) 85 000 000 (CL-033)

RegClLValToFValDelay

Defines the gap between the falling edges of the image's last line LVAL signal and the FVAL signal in Camera Link clock cycles.

Change the value of this functionality with extreme caution.

Changing the value of this functionality may have an impact on the Camera Link timing. It may cause side effects such as jitter in the image output or increasing delay between recorded image and output image if configured inappropriately.

Register name	`RegClLValToFValDelay`
Register type	IntReg
Access mode	R/W
Address	0x000C0014
Length (Bytes)	4
Bits used	31..0

Possible values	Description
0	Minimum
1024	Maximum

RegClLValToLValDelay

Defines the width of the line gap in Camera Link clock cycles.

Change the value of this functionality with extreme caution

Changing the value of this functionality may have an impact on the Camera Link timing. It may cause side effects such as jitter in the image output or increasing delay between recorded image and output image if configured inappropriately.

Register name	`RegClLValToLValDelay`
Register type	IntReg
Access mode	R/W
Address	0x000C0010
Length (Bytes)	4
Bits used	31..0

Possible values	Description
1	Minimum
1024	Maximum

RegClMinFValToFValDelay

Defines the minimum gap between the falling and the rising edge of the FVAL signal in Camera Link clock cycles.

Change the value of this functionality with extreme caution.

Using improper values may impact the Camera Link timing, with side effects such as image jitter output or increasing delay between image acquisition and output.

Register name	`RegClMinFValToFValDelay`
Register type	IntReg
Access mode	R/W
Address	0x000C0018
Length (Bytes)	4
Bits used	31..0

Possible values	Description
1	Minimum
1024	Maximum

RegClMinFValToLValDelay

Defines the minimum gap between the rising edges of the FVAL and the image's first line LVAL signal in Camera Link clock cycles.

The real delay may be higher than the value specified here.

Change the value of this functionality with extreme caution.

Using improper values may impact the Camera Link timing, with side effects such as image jitter output or increasing delay between image acquisition and output.

Register name	`RegClMinFValToLValDelay`
Register type	IntReg
Access mode	R/W
Address	0x000C000C
Length (Bytes)	4
Bits used	31..0

Possible values	Description
0	Minimum
1023	Maximum

RegDeviceTapGeometry

This device tap geometry functionality describes the geometrical properties characterizing the taps of a camera as presented at the output of the device.

Register name	`RegDeviceTapGeometry`
Register type	MaskedIntReg
Access mode	R
Address	0x0001211C
Length (Bytes)	4
Used Bits	31..0

Enumeration values:	
Value	**Name and description**
1	*`Geometry_1X_1Y`* One pixel per clock cycle
2	*`Geometry_1X2_1Y`* Two pixels per clock cycle

RegPayloadSize

Maximum size of image block payload.

Register name	`RegPayloadSize`
Register type	IntReg
Access mode	RO
Address	0x00011170
Length (Bytes)	4
Bits used	31..0

Possible values	**Description**
`(Camera dependent)`	Minimum
`(Camera dependent)`	Maximum

UserSetControl

Contains the functionalities related to the User Set Control to save and load the user device settings.

RegUserSetDefault

Selects the user set to be loaded on power-up or reset.

Register name	`RegUserSetDefault`
Register type	IntReg
Access mode	R/W
Address	0x0001710C
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*`Default`* Selects factory defaults to be loaded upon camera startup.
1	*`UserSet1`* Selects UserSet1's settings to be loaded upon camera startup.
2	*`UserSet2`* Selects UserSet2's settings to be loaded upon camera startup.
3	*`UserSet3`* Selects UserSet3's settings to be loaded upon camera startup.
4	*`UserSet4`* Selects UserSet4's settings to be loaded upon camera startup.
5	*`UserSet5`* Selects UserSet5's settings to be loaded upon camera startup.

RegUserSetCmdExecute

Register name	`RegUserSetCmdExecute`
Register type	IntReg
Access mode	W
Address	0x00017108
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
1	*`UserSetLoad`* Loads camera parameters from the user set specified by `RegUserSetNumber`.
2	*`UserSetSave`* Saves camera parameters to the user set specified by `RegUserSetNumber`. The default setting cannot be overwritten.

RegUserSetNumber

Selects a user set, for loading or saving camera parameters.

Register name	`RegUserSetNumber`
Register type	IntReg
Access mode	R/W
Address	0x00017104
Length (Bytes)	4
Bits used	31..0

Enumeration values:	
Value	**Name and description**
0	*`Default`* Selects the factory default to be loaded upon the next user set load operation. The factory defaults cannot be written using a user set write operation.
1	*`UserSet1`* Selects UserSet1 to be loaded or saved upon the next user set load/ save operation.
2	*`UserSet2`* Selects UserSet2 to be loaded or saved upon the next user set load/ save operation.
3	*`UserSet3`* Selects UserSet3 to be loaded or saved upon the next user set load/ save operation.
4	*`UserSet4`* Selects UserSet4 to be loaded or saved upon the next user set load/ save operation.
5	*`UserSet5`* Selects UserSet5 to be loaded or saved upon the next user set load or save operation.

RegUserSetCount

Contains the number of user sets available in the camera including the factory settings.

Register name	`RegUserSetCount`
Register type	IntReg
Access mode	R
Address	0x00017100
Length (Bytes)	4
Bits used	31..0

RegUserSetInq

Register name	`RegUserSetInq`
Register type	MaskedIntReg
Access mode	R
Address	0x00017000
Length (Bytes)	4
Bits used	31

Bit assignment		
Bit	**Name and description**	
31	Contains 1 if the camera supports user sets.	

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