emergent
vision technologies

Camera Attributes Manual

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Overview

This document is the Camera Attributes manual for Emergent Vision Technologies cameras.

It covers all cameras so not all attributes are available on all cameras or firmware versions. For example, a monochrome camera will not have color image format modes.

Attributes are programmable through the Emergent API documented in the Emergent Programmer's Reference Manual.

Emergent cameras are GenICam compliant so XML files are used to determine attribute functionality. This document puts this attribute information in a more readable format.

Attribute Reference

DeviceInformation

See eSDK example “EVT_DeviceInformation” for usage and functional example.

DeviceVendorName

Access Mode: RO
Node Type: String
Name of the camera vendor: ie. “EVT”

DeviceModelName

Access Mode: RO
Node Type: String
Name of the camera model: ie. “HR-12000SC”

DeviceVersion

Access Mode: RO
Node Type: String
The camera version: ie. “1.0”

DeviceSerialNumber

Access Mode: RO
Node Type: String
The camera serial number: ie. “01200231”

DeviceFirmwareVersion

Access Mode: RO
Node Type: String
The camera firmware version: ie. “3.24”

DeviceUserName

Access Mode: RW
Node Type: String
Name that User may assign. ie. “Camera10”

SensTemp

Access Mode: RO

Node Type: Int32

Temperature reading of the sensor in Celsius: ie. 34

ImageFormatControl

See eSDK example “EVT_ImageFormatControl” for usage and functional example.

Width

Access Mode: RW

Node Type: Uint32

The horizontal size of the ROI.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes such as OffsetX so rechecking limits after other dependent settings changes is recommended.

Height

Access Mode: RW

Node Type: Uint32

The vertical size of the ROI.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes such as OffsetY so rechecking limits after other dependent settings changes is recommended.

PixelFormat

Access Mode: RW

Node Type: Enumeration

The pixel output mode for the camera. Follows standard naming.

Supported pixel formats vary based on camera model but examples are:

MONO:	Mono8
	Mono10
	Mono10Packed
	Mono12
	Mono12Packed
COLOR:	BayerGB8/BayerGR8/BayerRG8/BayerBG8
	BayerGB10/BayerGR10/BayerRG10/BayerBG10
	BayerGB10Packed/BayerGR10Packed/BayerRG10Packed/BayerBG10Packed
	BayerGB12Packed/BayerGR12Packed/BayerRG12Packed/BayerBG12Packed
	RGB8Packed
	RGB10Packed
	BGR8Packed
	BGR10Packed
	YUV411Packed
	YUV422Packed
	YUV444Packed

OffsetX

Access Mode: RW

Node Type: Uint32

The horizontal offset of the ROI.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes such as Width so rechecking limits after other dependent settings changes is recommended.

OffsetY

Access Mode: RW

Node Type: Uint32

The vertical offset of the ROI.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes such as Height so rechecking limits after other dependent settings changes is recommended.

FlipX

Access Mode: RW

Node Type: Bool

Flips the image in the X direction when true.

Iris

Access Mode: RW

Node Type: Uint32

For cameras using a Birger EF adapter, this value is defined as follows.

0 = initialize the iris mechanism and set iris wide open.

1+ = set the number of stops

Note that if mechanism is confused by values which are too large or if lens is powered/swapped/etc after last initialization then may need to initialize again with Iris = 0.

Focus

Access Mode: RW

Node Type: Uint32

For cameras using a Birger EF adapter, this value is defined as follows.

0 = initialize the focus mechanism and set focus to minimum absolute value.

1+ = set the focus to the absolute value

Note that if mechanism is confused by values which are too large or if lens is powered/swapped/etc after last initialization then may need to initialize again with Focus = 0.

SubSample

Access Mode: RW

Node Type: Enumeration

Allows user to maintain same field of but skip pixels for lower resolution and data rate.

Higher frame rates can be achieved in subsampled images on some models.

Note that this is not binning as in traditional CCD cameras in that pixels are not summed but rather skipped.

Supported subsample options are:

- 1x1
- 2x2
- 4x4
- 8x8

AcquisitionControl

See eSDK example “EVT_AcquisitionControl” for usage and functional example.

AcquisitionMode

Access Mode: RW

Node Type: Enumeration

Continuous: For all modes except when MultiFrame used.

MultiFrame: Use for hardware or software trigger modes where multiple frames are to be triggered by a single hardware pulse or single software trigger.

Used in conjunction with AcquisitionFrameCount.

AcquisitionStart

Access Mode: WO

Node Type: Command

The standard GenICam command. In TriggerMode “Off” this command starts streaming images until the AcquisitionStop command is executed. In TriggerMode “On”, this command prepares the camera for triggers selected by TriggerSource and when

AcquisitionStop command is executed the camera is put on standby from such trigger events.

AcquisitionStop

Access Mode: WO

Node Type: Command

The standard GenICam command. See AcquisitionStart.

TriggerMode

Access Mode: RW

Node Type: Enumeration

Enable or disable non-continuous (ie. Not free-run) trigger modes.

Off: Disabled

On: Enabled

TriggerSoftware

Access Mode: WO

Node Type: Command

Command to send a software trigger request to camera

applicable when TriggerMode is enabled and TriggerSource is Software.

TriggerSource

Access Mode: RW

Node Type: Enumeration

The trigger sources applicable when TriggerMode is “On”.

Software: Will use TriggerSoftware command to trigger captures or when PTPMode is not “Off.”

Hardware: Will use GPIO to trigger captures.

Exposure

Access Mode: RW

Node Type: Uint32

Sets the camera exposure in micro-seconds.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is recommended.

AutoExposure

Access Mode: RW

Node Type: Bool

Use to enable auto exposure control. Use AutoExpSet and AutoExpIGain to program set point and integral gain (auto exposure rate) respectively.

AutoExpSet

Access Mode: RW

Node Type: Uint32

Auto exposure set point in 10bit grey levels.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

AutoExpIGain

Access Mode: RW

Node Type: Uint32

Auto exposure rate.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

FrameRate

Access Mode: RW

Node Type: Uint32

Sets the desired frame rate.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is recommended.

FrameRatemHz

Access Mode: RW

Node Type: Uint32

Sets the desired frame rate in milli-Hz. Convenient for those needing fractional frame rates: ie. 29.97Hz.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is recommended.

LineTime

Access Mode: RW

Node Type: Uint32

Sets the desired line time to read images out of on-camera memory. This can be used to slow down the data transmission on a line-by-line basis for those softwares that cannot keep up. The parameter is in 150MHz clock cycles but since this parameter is used to slow the continuous data rate it is only necessary to set frame rate to the desired value and then set the line-time parameter to the minimum. At max frame rate the line time min is the same as max and thus cannot be adjusted. At lower frame rates the line time range opens up. The lower the frame rate, the greater the range of adjust in the max line time.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is recommended.

AcquisitionFrameCount

Access Mode: RW

Node Type: Uint32

The number of frames to capture for a MultiFrame trigger sequence. Setting this to a number greater than 1 enables a multi-frame capture.

Use API functions as in example to get, set, and determine minimum, maximum. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is recommended.

Sync

Access Mode: WO

Node Type: Command

For using with Myricom Sync NICs w/ IRIG timesource for achieving multicamera synchronization to micro-second levels. This command makes the SyncOffset time offset be applied to the current in-camera timer to push out the start of the next exposure for this particular camera.

Use API functions as in example to get, set, and determine minimum, maximum.

SyncOffset

Access Mode: RW

Node Type: Uint32

For using with Myricom Sync NICs w/ IRIG timesource for achieving multicamera synchronization to micro-second levels. This parameter determines the time offset to be applied to the current in-camera timer to push out the start of the next exposurefor this particular camera as executed by the Sync command.

Use API functions as in example to get, set, and determine minimum, maximum.

PtpMode

Access Mode: RW

Node Type: Enumeration

The mode options for PTP support

Off: PTP is not used

OneStep: PTP is enabled and only PTP “Sync” is processed in calculating the camera internal PTP clock.

TwoStep: PTP is enabled and PTP “Sync” and “Follow-up” are processed in calculating the camera internal PTP clock.

PtpStatus

Access Mode: RO

Node Type: Enumeration

The current PTP status.

Disabled: PTPMode is set to off so not enabled.

Listening: PTPMode is enabled in camera but does not have a lock on any incoming PTP clock.

Calibrating: PTP clock has been found and rate calibration being performed if needed.

Slave: PTP clock has been acquired and camera now has a valid and reliable PTP clock.

PtpAcquisitionGateTimeHigh

Access Mode: RW

Node Type: Uint32

This is the time set in the future to begin an acquisition. This register is the upper 32 bits of the gate time.
Use API functions as in example to get, set, and determine minimum, maximum. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is recommended.

PtpAcquisitionGateTimeLow

Access Mode: RW

Node Type: Uint32

This is the time set in the future to begin an acquisition. This register is the lower 32 bits of the gate time.
Use API functions as in example to get, set, and determine minimum, maximum. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is recommended.

PtpOffset

Access Mode: RO

Node Type: Int32

This is the offset or worst-case error in nano-seconds between the grandmaster PTP clock and the camera clock upon reception of the updated clock from the grandmaster.

AnalogControl

See eSDK example “EVT_AnalogControl” for usage and functional example.

Gain

Access Mode: RW

Node Type: Uint32

Gain to apply to the image before transmission. Default value is 256 which equates to 0dB or gain of 1.
The formula for gain is: GV/V = Gslider/256, or GdB = 20log10(Gslider/256).
Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

PGAGain

Access Mode: RW

Node Type: Uint32

Sensor analog gain if available.
Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

Offset

Access Mode: RW

Node Type: Uint32

Offset to apply to the image before transmission.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

OffsetSigned

Access Mode: RW

Node Type: Int32

Offset to apply to the image before transmission but allows for negative offsets.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

AutoGain

Access Mode: RW

Node Type: Bool

Use to enable auto gain control. Use AutoGainSet and AutoGainIGain to program set point and integral gain (auto gain rate) respectively.

AutoGainSet

Access Mode: RW

Node Type: Uint32

Auto gain set point in 10bit grey levels.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

AutoGainIGain

Access Mode: RW

Node Type: Uint32

Auto gain rate.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

LUTEnable

Access Mode: RW

Node Type: Bool

Use to enable LUT. Use LUTIndex and LUTValue to program the LUT (look-up table).

LUTIndex

Access Mode: RW

Node Type: Uint32

The address to the given LUT entry. Some cameras are 10bit max and others 12bit which changes how many elements are used: 1024 vs 4096.

The LUT is expected to be programmed sequentially so the following process should be used:

LUTIndex=0

LUTValue=v0

LUTIndex=1

LUTValue=v1

LUTIndex=2

LUTValue=v2

...

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

LUTValue

Access Mode: RW

Node Type: Uint32

The value to program to the given LUT address LUTIndex. Some cameras are 10bit max and others 12bit which changes how many elements are used: 1024 vs 4096.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

WB_R_GAIN_Value

Access Mode: RW

Node Type: Uint32

The value to program for red channel white balance gain. Its use is the same as the Gain parameter.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

WB_GR_GAIN_Value

Access Mode: RW

Node Type: Uint32

The value to program for green channel (Green on the Bayer pattern red line) white balance gain.

Its use is the same as the Gain parameter.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

WB_GB_GAIN_Value

Access Mode: RW

Node Type: Uint32

The value to program for green channel (Green on the Bayer pattern blue line) white balance gain.

Its use is the same as the Gain parameter.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

WB_B_GAIN_Value

Access Mode: RW

Node Type: Uint32

The value to program for blue channel white balance gain.

Its use is the same as the Gain parameter.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

WB_Enable

Access Mode: RW

Node Type: Bool

Use to enable Auto White Balance mode. Based on image means for all bayer channels being equal.

WB_Hold

Access Mode: RW

Node Type: Bool

Use to enable Auto White Balance Hold mode. Once an acceptable white balance is achieved through the auto white balance function one can enable this to hold the current white balance gains. Disable this to continue the auto white balance function.

CCMIndex

Access Mode: RW

Node Type: Uint32

The address to the given CCM entry. The CCM matrix and the operation is defined as:

$$\begin{bmatrix} A_{11} & A_{12} & A_{13} \\ A_{21} & A_{22} & A_{23} \\ A_{31} & A_{32} & A_{33} \end{bmatrix} \qquad \begin{bmatrix} Ro \\ Go \\ Bo \end{bmatrix} = \begin{bmatrix} A_{11} & A_{12} & A_{13} \\ A_{21} & A_{22} & A_{23} \\ A_{31} & A_{32} & A_{33} \end{bmatrix} \begin{bmatrix} Ri \\ Gi \\ Bi \end{bmatrix}$$

The CCM is expected to be programmed sequentially so the following process should be used:
CCMIndex=0
CCMValue=A11
CCMIndex=1
CCMValue=A12
CCMIndex=2
CCMValue=A13
CCMIndex=3
CCMValue=A21
CCMIndex=4
CCMValue=A22
CCMIndex=5
CCMValue=A23
CCMIndex=6
CCMValue=A31
CCMIndex=7
CCMValue=A32
CCMIndex=8
CCMValue=A33

This is a rarely used parameter since we have factory calibrated CCM tables for different color temperatures which can be used through the ColorTemp parameter.
For more information on the CCM process, one can visit: http://www.imatest.com/docs/colormatrix/
Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

CCMValue

Access Mode: RW
Node Type: Uint32
Please see CCMIndex.

ColorTemp

Access Mode: RW
Node Type: Enumeration
Select the color temperature of the lighting to utilize the factory calibrated CCMs.
CT_Off: CCM matrix is the identity matrix (ie. CCM feature not in use)
CT_2800K: 2800 Kelvin
CT_3000K: 3000 Kelvin
CT_4000K: 4000 Kelvin
CT_5000K: 5000 Kelvin
CT_6500K: 6500 Kelvin
CT_Custom: Values used with user setting of CCMIndex/CCMValue.

AutoSizeX

Access Mode: RW

Node Type: Uint32

AutoSizeX, AutoSizeY, AutoOffsetX, AutoOffsetY define the ROI for all auto functionality including auto exposure, auto gain, and auto white balance.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is needed.

AutoSizeY

Access Mode: RW

Node Type: Uint32

AutoSizeX, AutoSizeY, AutoOffsetX, AutoOffsetY define the ROI for all auto functionality including auto exposure, auto gain, and auto white balance.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is needed.

AutoOffsetX

Access Mode: RW

Node Type: Uint32

AutoSizeX, AutoSizeY, AutoOffsetX, AutoOffsetY define the ROI for all auto functionality including auto exposure, auto gain, and auto white balance.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is needed.

AutoOffsetY

Access Mode: RW

Node Type: Uint32

AutoSizeX, AutoSizeY, AutoOffsetX, AutoOffsetY define the ROI for all auto functionality including auto exposure, auto gain, and auto white balance.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps. Note that limits are influenced by other nodes so rechecking limits after other dependent settings changes is needed.

DarkFPNEnable

Access Mode: RW

Node Type: Bool

Use to enable dark level FPN correction with Line Scan cameras.

DarkFPNCal

Access Mode: WO

Node Type: Command

With lens cap on or no light we execute this command to calibrate the dark level FPN.

When this command is executed, the image height must be >= 1024

LitFPNEnable

Access Mode: RW

Node Type: Bool

Use to enable lit level FPN correction with Line Scan cameras.

LitFPNCal

Access Mode: WO

Node Type: Command

With uniform and non-static lighting we execute this command to calibrate the lit level FPN.

When this command is executed, the image height must be >= 1024

TransportLayerControl

See eSDK example “EVT_TransportLayerControl” for usage and functional example.

GevSCPSPacketSize

Access Mode: RW

Node Type: Uint32

The Ethernet/IP (MTU) packet size to use for image transmission.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

HBTimeout

Access Mode: RW

Node Type: Uint32

This defines the timeout in milli-seconds during which the camera must receive a heartbeat command from the host application to remain available and connected for this primary host application.

The default value is 3000 (3 seconds as defined by the GigEVision specification).

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

HBDisable

Access Mode: RW

Node Type: Bool

This defines whether the camera is in heartbeat mode or not. When set to FALSE, the camera is expecting a heartbeat command within every HBTimeout seconds else it will disconnect and be available for host applications to connect to. When set to FALSE, the eCapture or eSDK software creates a heartbeat thread in the background to send these heartbeats. If the camera disconnects due to absence of heartbeats, then the API will return error when eventually a command is sent from the then controlling application which is a sign that an application needs to re-open the camera.

This feature is useful in the cases of PC or software crashes as well as cases where link has gone down because of broken cable or other hardware malfunction without the need then for power cycling the camera.

Use to enable auto exposure control. Use AutoExpSet and AutoExpIGain to program set point and integral gain (auto exposure rate) respectively.

GevTimestampControlLatch

Access Mode: WO

Node Type: Command

The standard GigEVision/GenICam command which tells the camera upon receiving this command to latch the current timestamp counter for subsequent reading via GevTimestampValueHigh and GevTimestampValueLow.

GevTimestampControlReset

Access Mode: WO

Node Type: Command

The standard GigEVision/GenICam command which tells the camera upon receiving this command to reset or zero the current timestamp counter.

GevTimestampValueHigh

Access Mode: RW

Node Type: Uint32

This is the upper 32 bits of the currently latched value of the Timestamp counter.

In PTP modes, this is the PTP clock in the camera.

GevTimestampValueLow

Access Mode: RW

Node Type: Uint32

This is the lower 32 bits of the currently latched value of the Timestamp counter.

In PTP modes, this is the PTP clock in the camera.

GevTimestampTickFrequencyHigh

Access Mode: RO

Node Type: Uint32

This is the upper 32 bits of the frequency in Hz of the clock in the camera used to define what each tick of GevTimestampValue means. ie. 150000000 means 150MHz so that each count of GevTimestampValue is 1/150MHz = 6.66ns.

GevTimestampTickFrequencyLow

Access Mode: RO

Node Type: Uint32

This is the lower 32 bits of the frequency in Hz of the clock in the camera.

GPIO

See eSDK example “EVT_GPIO” for usage and functional example.

GPO_n_Mode

Access Mode: RW

Node Type: Enumeration

The mode to use for the nth GPO output. Ie. GPO_0_Mode. IO is defined in the User’s Manual.

Exposure: Output a pulse that is active during exposure.

Readout: Output a pulse that is active during readout.

GPO: Use as general purpose output set by polarity.

Test_Generator: To generate frame time clock of varying duty cycle. See TG_Frame_time, TG_High_time

GPO_n_Polarity

Access Mode: RW

Node Type: Bool

The polarity of the nth GPO output. Positive or negative. ie. GPO_0_Polarity

GPI_n_Polarity

Access Mode: RO

Node Type: Bool

Read this parameter to determine the current state of the nth GPI input. ie. GPI_4_Polarity.

GPI_Start_Exp_Mode

Access Mode: RW

Node Type: Enumeration

The GPIO input to use for start exposure from external trigger.

It may be the same input as for end exposure. ie.

GPI_4

GPI_5

GPI_Start_Exp_Event

Access Mode: RW

Node Type: Enumeration

The event that triggers the start of exposure.

Rising_Edge: The input signal rising edge triggers.

Falling_Edge: The input signal falling edge triggers.

GPI_End_Exp_Mode

Access Mode: RW

Node Type: Enumeration

The GPIO input to use for end exposure from external trigger.

It may be the same input as for start exposure.

GPI_4

GPI_5

Internal : exposure start based on trigger input but exposure end based off Exposure register.

GPI_End_Exp_Event

Access Mode: RW

Node Type: Enumeration

The event that triggers the end of exposure.

Rising_Edge: The input signal rising edge triggers.

Falling_Edge: The input signal falling edge triggers.

GPI_n_Debounce_Count

Access Mode: RW

Node Type: Uint32

Value in 50MHz clock cycle counts. For example, a count of 1000 will provide a debounce time of 1000/50MHz = 20us. Debounce is used when triggering from external signals via GPI_n allows the camera to compensate for sampling input trigger signals with different signal rise and fall times. Generally, setting this time to be greater than the worst-case input rise and fall time should ensure proper operation.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

Trigger_Delay

Access Mode: RW

Node Type: Uint32

Value in us to set for trigger delay time. The externally triggered exposure will be delayed relative to the external triggering signal by the amount specified in this register.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

TG_Frame_Time

Access Mode: RW

Node Type: Uint32

Value in us to set as period of frame time clock out of any GPO. Care must be taken to ensure that reasonable values are set for this parameter with consideration to exposure, readout time, etc. The safest way is to determine the frame rate/time limits using the simple internal continuous mode.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

TG_High_Time

Access Mode: RW

Node Type: Uint32

Value in us to set as high time of frame time clock out of any GPO. Care must be taken to ensure that reasonable values are set for this parameter with consideration to exposure, readout time, etc. The safest way is to determine the frame rate/time limits using the simple internal continuous mode.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

UartEnable

Access Mode: RW

Node Type: Bool

Use to enable/disable Uart mode. In Uart mode, the Uart receive data come into the camera on GPI5 and the Uart transmit data goes out GPO3. These IO are reserved for Uart functionality in this mode.

Many customers use the Uart functionality to control devices such as the Birger Canon EF mount module

UartBaud

Access Mode: RW

Node Type: Emuneration

The baud rate of the Uart interface is set through this parameter.

Higher baud rates may have bandwith restrictions depending how the IO are configured.

B_9600

B_19200

B_38400

B_57600

B_115200

UartDataBits

Access Mode: RW

Node Type: Uint32

Number of data bits for the Uart interface.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

UartStopBits

Access Mode: RW

Node Type: Uint32

Number of stop bits for the Uart interface.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

UartTxData

Access Mode: WO

Node Type: Uint32

Writing this parameter writes a word to the Uart transmit FIFO which will be shortly followed by its transmission on the Uart transmit interface.

UartTxFifoCnt

Access Mode: RO

Node Type: Uint32

Read this parameter to find out how many words are in the Uart transmit FIFO (ie. Not yet transmitted).

UartRxData

Access Mode: RO

Node Type: Uint32

Read this parameter to read a word out of the receive FIFO.

UartRxFifoCnt

Access Mode: RO

Node Type: Uint32

Read this parameter to find out how many words are in the Uart receive FIFO (ie. Not yet read out).

GPI_Start_Frame_Mode

Access Mode: RW

Node Type: Enumeration

The GPIO input to use for start frame from external trigger.

GPI_1

GPI_2

Applicable to Line Scan cameras. See User's Manual for more details.

GPI_Start_Frame_Event

Access Mode: RW

Node Type: Enumeration

The event that triggers the start of frame.

Rising_Edge: The input signal rising edge triggers.

Falling_Edge: The input signal falling edge triggers.

Encoder_Frame_Divider: The internal encoder frame divider counter triggers.

Pulse_High: The camera triggers by encoder frame divider while GPI input is high.

Pulse_Low: The camera triggers by encoder frame divider while GPI input is low.

Applicable to Line Scan cameras. See User's Manual for more details.

GP_ENC_MODE

Access Mode: RW

Node Type: Bool

Set to True to enable use of external encoder in triggering.

Applicable to Line Scan cameras. See User's Manual for more details.

GP_ENC_TERMINATION

Access Mode: RW

Node Type: Bool

Set to True to enable use of 120 Ohms termination on the RS422 differential encoder input.

Applicable to Line Scan cameras. See User's Manual for more details.

GP_ENC_DIRECTION

Access Mode: RW

Node Type: Bool

True or false determines the direction of the encoder rotation.

Applicable to Line Scan cameras. See User's Manual for more details.

GP_ENC_LINE_DIVIDER

Access Mode: RW

Node Type: Uint32

This value determines how many encoder pulses are needed to trigger a single line.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

Applicable to Line Scan cameras. See User's Manual for more details.

GP_ENC_FRAME_DIVIDER

Access Mode: RW

Node Type: Uint32

This value determines how many encoder ticks will pass before another frame is started.

Use API functions as in example to get, set, and determine minimum, maximum, and quantization/increment steps.

Applicable to Line Scan cameras. See User's Manual for more details.

GP_SPAT_CORR

Access Mode: RW

Node Type: Enumeration

Allows spatial correction which accounts for line gaps in tri-linear sensors.

p8 : 8 lines in positive direction.

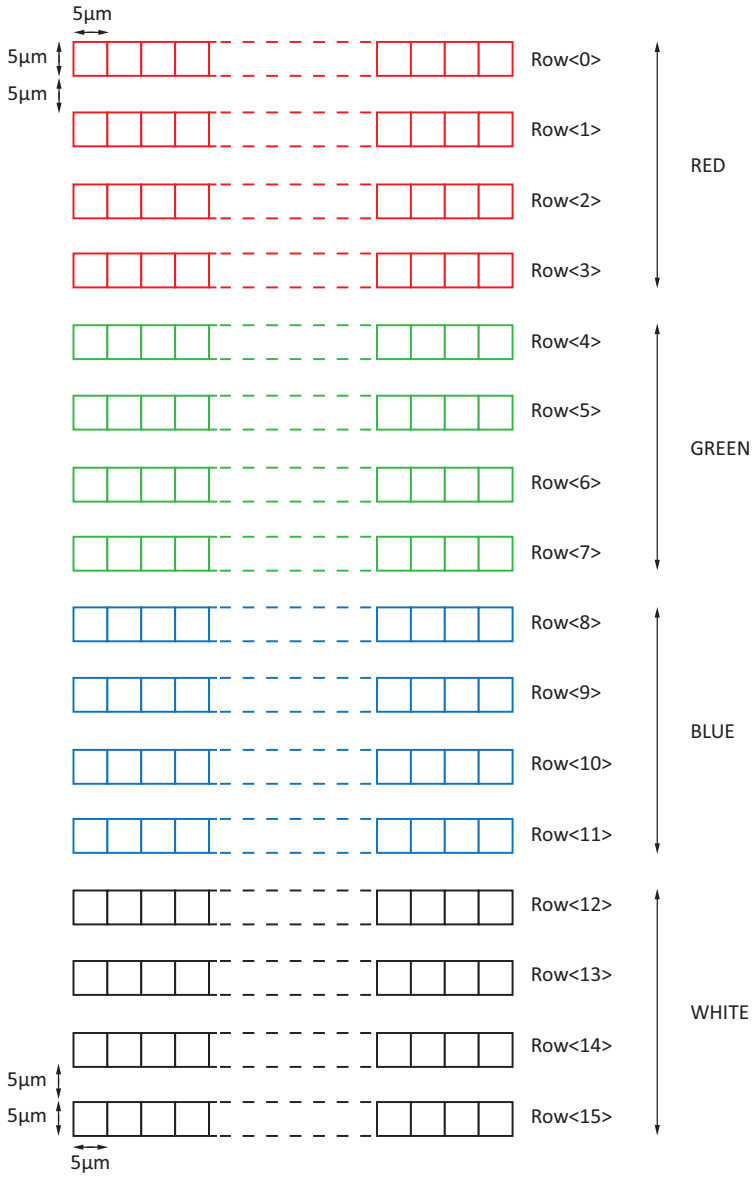
Off : Spatial correction disabled.

n8 : 8 lines in negative direction.

Applicable to Line Scan cameras.

The value of 8 is chosen based on the 8x5um spacing between the different colors.

One color is chosen from each color subgroup to create the overall RGB pixels.



GP_ENC_TIMEOUT

Access Mode: RW

Node Type: Uint32

This value is used to determine how long the internal logic should wait before considering the current frame aborted due to absence or slowing of encoder pulses. Measured in 150MHz cycles.

GP_ENC_LINE_DIV_MEAS

Access Mode: RO

Node Type: Uint32

This value is the measured period of the line trigger pulses at the output of the divider set by GP_ENCODER_LINE_DIVIDER.
This measurement helps in determining the appropriate value of GP_ENC_TIMEOUT.
Measured in 150MHz cycles.

GP_ENC_FRAME_DIV_MEAS

Access Mode: RO

Node Type: Uint32

This value is the measured period of the frame trigger pulses at the output of the divider set by GP_ENCODER_FRAME_DIVIDER.
Measured in 150MHz cycles.

Document History

Version	Date	Description
1.01	29 May 2012	Initial Version
1.02	8 March 2013	Added HDR Mode
1.03	25 June 2013	Added GPI Debounce Option
1.04	20 July 2013	Added Auto white balance and hold functions
1.05	10 December 2013	Clarified Gain operation
1.06	2 May 2014	Added Uart, Sync, Line Time, GPI4/5 Polarity parameters
1.07	1 December 2014	Added Subsample parameters
1.08	15 July 2019	Rewrite
1.09	11 June 2020	Updated line-scan information