

PROSILICA

GigE Camera Registers

Hardware Reference Manual

Firmware Version 1.34 (Draft)
December 23, 2008

Prosilica Inc. www.prosilica.com tel: 604.875.8855 fax: 604.875.8856

© 2006 Prosilica Inc. All rights reserved.

Overview

This document describes the manufacturer-specific registers of Prosilica's GigE Vision cameras. The bootstrap registers are not part of this document; please refer to the *GigE Vision Specification 1.0*.

Most likely, this document is not what you want to read. Here are some alternatives:

<i>Prosilica PVAPI Manual</i>	Describes Prosilica's programming interface, for C and other languages.
<i>GenICam Standard 1.0; GenICam Standard Features Naming Convention 1.02</i>	The camera contains a GenICam XML file which describes the camera's features. Most of these features use the recommended GigE Vision names.

If you are writing a program which directly writes camera registers – for example, to communicate through the serial port – this is the document you need.

Camera Registers

Unless otherwise specified, registers are unsigned 32-bit values. Bit 0 is LSB, bit 31 is MSB¹.

Camera Function

Address	Name	Bits	Description
10000h	CameraFunctionInquiry	[0]	[R] <i>Image Mode</i> registers exist. Always 1.
		[1]	[R] <i>Image Format</i> registers exist. Always 1.
		[2]	[R] <i>Acquisition Control</i> registers exist. Always 1.
		[3]	[R] <i>Feature Control</i> registers exist. Always 1.
		[4]	[R] <i>I/O Control</i> registers exist.
		[5]	[R] <i>Seriallo Control</i> registers exist.
		[6]	[R] <i>Memory</i> registers exist.
		[7]	[R] <i>Calibration</i> registers exist.
		[8]	[R] <i>Defect Tables</i> registers exist.
		[9]	[R] <i>Registry Data Access</i> registers exist.
		[10]	[R] <i>User-Loaded Library</i> registers exist.
		[other]	[R] Reserved. All zeros.
10004h	CameraErrorStatus	[0]	[R] An <i>Image Mode</i> register is invalid.
		[1]	[R] An <i>Image Format</i> register is invalid.
		[2]	[R] An <i>Acquisition Control</i> register is invalid.
		[3]	[R] A <i>Feature Control</i> register is invalid.

¹ This is opposite from GigeVision and GenICam, but natural to C programmers.

		[4]	[R] An <i>I/O Control</i> register is invalid.
		[5]	[R] Always 0.
		[6]	[R] A <i>Memory</i> register is invalid.
		[other]	[R] Reserved. All zeros.
10008h	CameraReset		[W] Reset type: 1: Reset imaging registers only 2: Hard reset Reset occurs immediately.

Image Mode

Address	Name	Bits	Description
11000h	ImageModelInquiry	[0]	[R] Supports horizontal binning or subsampling (<i>BinningX</i>).
		[1]	[R] Supports vertical binning or subsampling (<i>BinningY</i>).
		[2]	[R] Supports <i>StreamBytesPerSec</i> control.
		[3]	[R] Supports <i>StreamHold</i> control.
		[4]	[R] Supports <i>BandwidthCtrlMode</i> control.
		[other]	[R] Reserved. All zeros.
11010h	ImageModeErrorStatus	[0]	[R] Horizontal binning value is invalid.
		[1]	[R] Vertical binning value is invalid.
		[other]	[R] Reserved. All zeros.
11020h	SensorType	[7..0]	[R] Sensor type: 0: monochrome 1: Bayer color
		[15..8]	[R] Maximum bit depth of sensor ADC.
		[other]	[R] Reserved. All zeros.
11024h	SensorWidth		[R] Sensor width.
11028h	SensorHeight		[R] Sensor height.
11100h	BinningXInquiry	Supported horizontal binning values. If this is zero, use <i>BinningXMax</i> to determine the allowed range instead.	
		[0]	[R] 1x horizontal binning supported.
		[1]	[R] 2x horizontal binning supported.
		[2]	[R] 3x horizontal binning supported.
		[..31]	[R] ...continued to 32x horizontal binning...

11104h	BinningXMax		[R] Maximum horizontal binning allowed. If this is zero, use <i>BinningXInquiry</i> to determine the allowed values instead.
11108h	BinningXValue		[RW] Current horizontal binning value: 0: no binning ("1x" binning) 1: 2x binning 2: 3x binning...
11120h	BinningYInquiry		Supported vertical binning values. If this is zero, use <i>BinningYMax</i> to determine the allowed range instead.
		[0]	[R] 1x vertical binning supported.
		[1]	[R] 2x vertical binning supported.
		[2]	[R] 3x vertical binning supported.
		[..31]	[R] ...continued to 32x vertical binning...
11124h	BinningYMax		[R] Maximum vertical binning allowed. If this is zero, use <i>BinningYInquiry</i> to determine the allowed values instead.
11128h	BinningYValue		[RW] Current vertical binning value: 0: no binning ("1x" binning) 1: 2x binning 2: 3x binning...
11140h	StreamBytesPerSecMax		[R] The maximum GVSP stream rate, in bytes per second. This value depends on the camera's current ethernet connection speed (i.e. 100 Mbps or 1000 Mbps).
11144h	StreamBytesPerSec		[RW] The GVSP stream rate, in bytes per second. Read the maximum value from <i>StreamBytesPerSecMax</i> . This control is equivalent to the bootstrap register <i>SCPD0</i> ; a write (as permitted) to either register will change the value of both registers. Register <i>BandwidthCtrlMode</i> controls write access to <i>StreamBytesPerSec</i> and <i>SCPD0</i> .
11148h	StreamBandwidthReserved		[RW] The bandwidth, in percent, reserved for data resends. This amount is deducted from <i>StreamBytesPerSec</i> when determining the maximum image data rate. Range is 0 to 20.

11150h	BandwidthCtrlMode		<p>[RW] Bandwidth control:</p> <p>0: <i>StreamBytesPerSec</i> only</p> <p>1: <i>SCPD0</i> only</p> <p>2: both <i>StreamBytesPerSec</i> and <i>SCPD0</i></p> <p>In mode 0, writes to <i>SCPD0</i> are ignored. (No error is returned.)</p> <p>In mode 1, writes to <i>StreamBytesPerSec</i> are ignored. (No error is returned.)</p> <p>Host drivers often can't set up <i>SCPD0</i> properly. We recommend using bandwidth control mode 0.</p> <p>On firmware 1.24 or earlier: these cameras operate in mode 2.</p>
11160h	StreamHold		<p>[RW] GVSP stream-hold mode:</p> <p>0: regular streaming mode</p> <p>1: stream is paused</p> <p>When the GVSP stream is paused, acquired data is accumulated in on-board memory but not sent. When the stream is "un-paused", the acquired data is sent.</p> <p>The on-board memory is a circular buffer, and when the memory is full, new data overwrites the old data. When the stream is paused, memory overwrite is not an error, so <i>GEV_STATUS_DATA_OVERRUN</i> is not sent.</p>
11164h	StreamHoldCapacity		<p>[R] Capacity of stream hold in frames, for the current image settings. In other words, the number of frames which can be stored on the camera.</p> <p>This register is not available on firmware 1.24 or earlier.</p>

Image Format

Address	Name	Bits	Description
12000h	ImageFormatInquiry	[0]	[R] PixelFormat may be written. (Read access is always allowed.)
		[1]	[R] Width and Height may be written. (Read access is always allowed.)
		[2]	[R] RegionX and RegionY registers are supported.
		[3]	[R] MirrorX register is supported.
		[other]	[R] Reserved. All zeros.
12010h	ImageFormatErrorStatus	[0]	[R] PixelFormat error.
		[1]	[R] Region error. Check Width, Height, RegionX and RegionY.
		[other]	[R] Reserved. All zeros.
12100h	PixelFormatInquiry1	[1]	[R] "Mono8" PixelFormat supported.

		[3]	[R]	"Mono10" PixelFormat supported.
		[5]	[R]	"Mono12" PixelFormat supported.
		[9]	[R]	"BayerRG8" PixelFormat supported.
		[11]	[R]	"BayerBG8" PixelFormat supported.
		[15]	[R]	"BayerBG10" PixelFormat supported.
		[17]	[R]	"BayerRG12" PixelFormat supported.
		[20]	[R]	"Rgb8Packed" PixelFormat supported.
		[21]	[R]	"Bgr8Packed" PixelFormat supported.
		[22]	[R]	"Rgba8Packed" PixelFormat supported.
		[23]	[R]	"Bgra8Packed" PixelFormat supported.
		[24]	[R]	"Rgb10Packed" PixelFormat supported.
		[26]	[R]	"Rgb12Packed" PixelFormat supported.
		[30]	[R]	"YUV411" PixelFormat supported.
		[31]	[R]	"YUV422" PixelFormat supported.
		[other]	[R]	Reserved. All zeros.
12104h	PixelFormatInquiry2	[0]	[R]	"YUV444" PixelFormat supported.
		[other]	[R]	Reserved. All zeros.
12108h	PixelFormatInquiry3		[R]	Reserved. All zeros.
1210Ch	PixelFormatInquiry4		[R]	Reserved. All zeros.
12110h	MaxWidth		[R]	Maximum width, in pixels.
12114h	MaxHeight		[R]	Maximum width, in pixels.
12120h	PixelFormat		[R]	Pixel format: 01080001h: Mono8 01100003h: Mono10 01100005h: Mono12 01080009h: BayerRG8 0108000Bh: BayerBG8 0110000Fh: BayerBG10 01100011h: BayerRG12 02180014h: Rgb8Packed 02180015h: Bgr8Packed 02200016h: Rgba8Packed 02200017h: Bgra8Packed 02300018h: Rgb10Packed 0230001Ah: Rgb12Packed 020C001Eh: Yuv411 0210001Fh: Yuv422 02180020h: Yuv444
12124h	Width		[RW]	Image width, in pixels.

12128h	Height		[RW] Image height, in pixels.
1212Ch	RegionX		[RW] Location of first left pixel, from the first pixel available.
12130h	RegionY		[RW] Location of first top pixel, from first pixel available.
12134h	MirrorX		[RW] Mirror image horizontally: 0: Normal image 1: Mirrored image
12200h	PayloadSize		[R] Length of image data, in bytes. (Does not include data in GVSP leader or trailer.) This is always valid for the current <i>Image Format</i> settings, unless an error status flag is high.

Acquisition & Triggering

Address	Name	Bits	Description
13000h	AcqControlInquiry	[0]	[R] Acquisition Mode registers exist. Always 1.
		[1]	[R] Old trigger mode registers exist. Zero in firmware 1.24 and later.
		[2]	[R] FrameInterval registers exist.
		[3]	[R] LineInterval registers exist.
		[8]	[R] FrameStart trigger exists.
		[9]	[R] FrameEnd trigger exists.
		[10]	[R] FrameActive trigger exists.
		[11]	[R] AcquisitionStart trigger exists.
		[12]	[R] AcquisitionEnd trigger exists.
		[13]	[R] AcquisitionActive trigger exists.
		[14]	[R] AcquisitionEvent trigger exists.
		[15]	[R] LineStart trigger exists.
		[other]	[R] Reserved. All zeros.
13010h	AcqControlErrorStatus	[0]	[R] AcquisitionMode register is invalid.
		[1]	[R] Trigger setup is invalid. This includes the TriggerMode register and other registers applicable to the trigger mode.
		[2]	[R] Sequence setup is invalid.
		[other]	[R] Reserved. All zeros.
130E0h	AcquisitionStatus	[0]	[R] Acquisition status. 1=acquiring, 0=stopped.
		[other]	[R] Reserved. All zeros.
130F0h	AcquisitionCommandInquiry	[0]	[R] "Stop" acquisition command is supported. Always 1.

		[1]	[R]	"Start" acquisition command is supported. Always 1.
		[2]	[R]	"Abort" acquisition command is supported.
		[other]	[R]	Reserved. All zeros.
130F4h	AcquisitionCommand	[7..0]	[W]	Acquisition command: 0: Stop acquisition 1: Start acquisition 2: Abort acquisition When stopped, the stop occurs on the earliest frame boundary. When aborted, the abort occurs as soon as possible. (This register does not exist in firmware 1.08 and earlier.)
		[other]	[R]	Reserved. All zeros.
13100h	AcquisitionModeInquiry	[0]	[R]	Reserved. Zero. (Was "Stopped" in firmware 1.08 and earlier.)
		[1]	[R]	"Continuous" mode is supported. Always 1.
		[2]	[R]	"SingleFrame" mode is supported.
		[3]	[R]	"MultiFrame" mode is supported.
		[4]	[R]	"Recorder" mode is supported.
		[other]	[R]	Reserved. All zeros.
13104h	AcquisitionMode		[RW]	Current acquisition mode: 1: Continuous 2: SingleFrame – stop after 1 frame 3: MultiFrame – stop after N frames 4: Recorder – event recorder In event recorder mode, the total number of frames recorded is <i>AcquisitionFrameCount</i> .
13108h	AcquisitionFrameCount		[RW]	Frame count when acquisition mode is "MultiFrame" or "Recorder". When in recorder mode, this count should not be larger than <i>StreamHoldCapacity</i> . Register exists when "MultiFrame" or "Recorder" acquisition modes are supported. Range is 1 to 65535.
1310Ch	RecorderPreEventCount		[RW]	Recorder acquisition mode: number of frames to record, pre-event. (The number of post-event frames to record equals <i>AcquisitionFrameCount</i> minus <i>RecorderPreEventCount</i> .) Register exists when "Recorder" mode is supported. The number of pre-event frames recorded is never larger than <i>AcquisitionFrameCount</i> .
13130h	FrameIntervalMin		[R]	Minimum value for <i>FrameIntervalValue</i> (in microseconds between triggers).

13134h	FrameIntervalMax		[R]	Maximum value for <i>FrameIntervalValue</i> (in microseconds between triggers).
13138h	FrameIntervalValue		[RW]	Fixed frame rate, in microseconds between triggers. The fixed frame rate generator is used when the frame-start trigger is disabled (or when the frame trigger source is <i>FixedRate</i>). If this value is set lower than <i>FrameIntervalLimit</i> , frame-start will trigger as fast as possible.
1313Ch	FrameIntervalLimit		[R]	Minimum frame interval (i.e. maximum frame rate) which can be achieved for the current settings. For example, the exposure time setting might limit the maximum achievable frame rate.
13140h	LineIntervalMin		[R]	Minimum value for <i>LineIntervalValue</i> (in microseconds between triggers).
13144h	LineIntervalMax		[R]	Maximum value for <i>LineIntervalValue</i> (in microseconds between triggers).
13148h	LineIntervalValue		[RW]	Fixed line rate, in microseconds between triggers. The fixed line rate generator is used when the line-start trigger is disabled (or when the line trigger source is <i>FixedRate</i>). If this value is set lower than <i>LineIntervalLimit</i> , line-start will trigger as fast as possible.
1314Ch	LineIntervalLimit		[R]	Minimum line interval (i.e. maximum line rate) which can be achieved for the current settings. For example, the exposure time setting might limit the maximum achievable frame rate.
13160h	SoftwareTrigger	[0]	[W]	Software FrameStart trigger: 1=trigger.
			[R]	Software FrameStart trigger status: 1=trigger ready.
		[1]	[RW]	Software FrameEnd trigger. See above.
		[2]	[RW]	Software FrameActive trigger. See above.
		[3]	[RW]	Software AcquisitionStart trigger. See above.
		[4]	[RW]	Software AcquisitionEnd trigger. See above.
		[5]	[RW]	Software AcquisitionActive trigger. See above.
		[7]	[RW]	Software LineStart trigger. See above.
		[other]	[R]	Reserved. All zeros.
13164h	TriggerDelayMax		[R]	Maximum external trigger delay, in microseconds. (When applicable.)
13400h	FrameStartTriggerInquiry	[0]	[R]	Trigger event register is supported.
		[1]	[R]	Trigger delay register is supported.
		[other]	[R]	Reserved. All zeros.
13408h	FrameStartTrigModelnq1	[0]	[R]	“Freerun” trigger mode is supported.
		[1]	[R]	“SyncIn1” trigger mode is supported.
		[2]	[R]	“SyncIn2” trigger mode is supported.

		[3]	[R] "SyncIn3" trigger mode is supported.
		[4]	[R] "SyncIn4" trigger mode is supported.
		[5]	[R] "FixedRate" trigger mode is supported.
		[6]	[R] "Software-only" trigger mode is supported.
		[other]	[R] Reserved. All zeros.
1340Ch	FrameStartTrigModeInq2	[other]	[R] Reserved. All zeros.
13410h	FrameStartTrigMode	[15..0]	[RW] Current trigger source: 0: Freerun (as fast as possible) 1: SyncIn1 2: SyncIn2 3: SyncIn3 4: SyncIn4 5: FixedRate 6: Software-only Software trigger may occur any time this trigger is enabled. (For FrameStart Trigger only: <i>FixedRate</i> mode is equivalent to disabling this trigger. ²)
		[31]	[RW] Trigger enable: 0: Disabled 1: Enable frame trigger (For FrameStart Trigger only: <i>disabled</i> means the fixed rate generator is used. See <i>FrameIntervalValue</i> .)
		[other]	[R] Reserved. All zeros.
13414h	FrameStartTrigEventInq	[0]	[R] "EdgeRising" trigger event is supported.
		[1]	[R] "EdgeFalling" trigger event is supported.
		[2]	[R] "EdgeAny" trigger event is supported.
		[3]	[R] "LevelHigh" trigger event is supported.
		[4]	[R] "LevelLow" trigger event is supported.
		[other]	[R] Reserved. All zeros.
13418h	FrameStartTrigEvent		[RW] Trigger event: 0: EdgeRising 1: EdgeFalling 2: EdgeAny 3: LevelHigh 4: LevelLow Not applicable to software trigger.

² We have not lost our mind! This design was driven by GenICam constraints.

1341Ch	FrameStartTrigDelay		[RW] Delay between trigger event and start of exposure, in microseconds. (Not applied to software trigger.)
13440h	FrameEndTriggerInquiry		FrameEnd trigger. See registers for FrameStart, above.
13448h	FrameEndTrigModelInq1		
1344Ch	FrameEndTrigModelInq2		
13450h	FrameEndTrigMode		
13454h	FrameEndTrigEventInq		
13458h	FrameEndTrigEvent		
1345Ch	FrameEndTrigDelay		
13480h	FrameActiveTriggerInquiry		FrameActive trigger. See registers for FrameStart, above.
13488h	FrameActiveTrigModelInq1		
1348Ch	FrameActiveTrigModelInq2		
13490h	FrameActiveTrigMode		
13494h	FrameActiveTrigEventInq		
13498h	FrameActiveTrigEvent		
1349Ch	FrameActiveTrigDelay		
134C0h	AcqStartTriggerInquiry		AcqStart trigger. See registers for FrameStart, above.
134C8h	AcqStartTrigModelInq1		
134CCh	AcqStartTrigModelInq2		
134D0h	AcqStartTrigMode		
134D4h	AcqStartTrigEventInq		
134D8h	AcqStartTrigEvent		
134DCh	AcqStartTrigDelay		
13500h	AcqEndTriggerInquiry		AcqEnd trigger. See registers for FrameStart, above.
13508h	AcqEndTrigModelInq1		
1350Ch	AcqEndTrigModelInq2		
13510h	AcqEndTrigMode		
13514h	AcqEndTrigEventInq		
13518h	AcqEndTrigEvent		
1351Ch	AcqEndTrigDelay		
13540h	AcqActiveTriggerInquiry		AcqActive trigger. See registers for FrameStart, above.
13548h	AcqActiveTrigModelInq1		
1354Ch	AcqActiveTrigModelInq2		
13550h	AcqActiveTrigMode		
13554h	AcqActiveTrigEventInq		
13558h	AcqActiveTrigEvent		

1355Ch	AcqActiveTrigDelay		
13580h	AcqRecTriggerInquiry		AcqRec trigger. See registers for FrameStart, above.
13588h	AcqRecTrigModelInq1		
1358Ch	AcqRecTrigModelInq2		
13590h	AcqRecTrigMode		
13594h	AcqRecTrigEventInq		
13598h	AcqRecTrigEvent		
1359Ch	AcqRecTrigDelay		
135C0h	LineStartTriggerInquiry		LineStart trigger. See registers for FrameStart, above.
135C8h	LineStartTrigModelInq1		
135CCh	LineStartTrigModelInq2		
135D0h	LineStartTrigMode		
135D4h	LineStartTrigEventInq		
135D8h	LineStartTrigEvent		
135DCh	LineStartTrigDelay		

Feature Control

Address	Name	Bits	Description
14000h	ControlsInquiry1	[0]	[R] Exposure controls exist.
		[1]	[R] Gain controls exist.
		[2]	[R] White balance controls exist.
		[3]	[R] Offset controls exist.
		[4]	[R] Iris controls exist.
		[5]	[R] Continuous-DSP controls exist.
		[6]	[R] Defect masking controls exist.
		[7]	[R] Reserved for internal test controls. Always zero in production firmware.
		[other]	[R] Reserved. All zeros.
14004h	ControlsInquiry2		[R] Reserved. All zeros.
14010h	ControlsErrorStatus1	[0]	[R] Exposure controls are invalid.
		[1]	[R] Gain controls are invalid.
		[2]	[R] White balance controls are invalid.
		[3]	[R] Offset controls are invalid.
		[4]	[R] Iris controls are invalid.
		[6]	[R] Defect masking controls are invalid.

		[other]	[R] Reserved. All zeros.
14014h	ControlsErrorStatus2		[R] Reserved. All zeros.
140E0h	DspContinuousMode		[RW] Some controls, such as auto-exposure, auto-whitebalance, and auto-iris, perform automatic adjustments. When the frame trigger is intermittent or slow, these adjustments do not occur in a timely manner. This control enables or disables a special "continuous" imaging mode where the camera runs in the background while waiting for a trigger: 0: Off 1: On When continuous-DSP mode is enabled, a latency applies to the frame trigger. Register exists when "Continuous-DSP" controls exist.
140E4h	DspContinuousLatency		[R] When continuous mode is enabled, this register contains the frame trigger latency (microseconds). Register exists when "Continuous-DSP" controls exist.
140F0h	DspSubregionLeft		[RW] Some controls, such as auto-exposure, auto-whitebalance, and auto-iris, perform image processing. This sets the subregion (within the image) of the image data used by these algorithms. The left and top default values are 0; the right and bottom default values are 0xFFFFFFFF. This results in the entire image being used for the algorithms.
140F4h	DspSubregionTop		[RW] See DspSubregionLeft.
140F8h	DspSubregionRight		[RW] See DspSubregionLeft.
140FCh	DspSubregionBottom		[RW] See DspSubregionLeft.
14100h	ExposureModeInquiry	[1]	[R] "Manual" exposure mode is supported.
		[2]	[R] "AutoFit" exposure mode is supported.
		[3]	[R] "AutoFitOnce" exposure mode is supported.
		[4]	[R] "External" exposure mode is supported.
		[other]	[R] Reserved. All zeros.
14104h	ExposureMode		[RW] Current exposure mode: 1: Manual 2: Auto 3: AutoOnce 4: External If exposure mode is set to "AutoOnce", the mode will automatically switch to "Manual" once auto-exposure is complete. When using an automatic mode, the DspSubregion parameters apply.

14108h	ExposureValueMin		[R]	Minimum exposure value, in microseconds.
1410Ch	ExposureValueMax		[R]	Maximum exposure value, in microseconds.
14110h	ExposureValue		[R]	Current exposure value, in microseconds. Valid when exposure mode is not “External”.
			[W]	Set current value, when mode is “Manual”.
14114h	ExposureAutoAlgInquiry	[0]	[R]	“Mean” auto-exposure algorithm is supported.
		[1]	[R]	“FitRange” auto-exposure algorithm is supported.
		[other]	[R]	Reserved. All zeros.
14118h	ExposureAutoAlg		[RW]	<p>Current auto-exposure algorithm:</p> <p>0: Mean</p> <p>1: FitRange</p> <p>The “FitRange” auto-exposure algorithm is intended for machine vision applications. The exposure is adjusted to fit the image data within the range of the analog to digital converter.</p> <p>The “Mean” auto-exposure algorithm is intended for visual applications, or cases where part of the image should be saturated. This allows the user to set the mean level of the image data.</p>
1411Ch	ExposureAutoMin		[RW]	Minimum exposure value allowed to be set by the auto-exposure function.
14120h	ExposureAutoMax		[RW]	Maximum exposure value allowed to be set by the auto-exposure function.
14124h	ExposureAutoTarget		[RW]	When using “Mean” algorithm, this value sets the mean value of the image data, in percent. In other words, this allows the auto-expose level to be brightened or darkened. Value is from 0 to 100.
14128h	ExposureAutoRate		[RW]	Auto-exposure adjustment rate, in percent. Range is 1 (slowest) to 100 (fastest).
1412Ch	ExposureAutoOutliers		[RW]	Number of top outliers to discard when calculating auto-exposure. Value is in percent of the number of pixels in an image, from 0 to 50.
14130h	ExposureAutoAdjustTol		[RW]	The auto-exposure tolerance. Once the current exposure value is beyond this tolerance from the calculated value, an auto-exposure adjustment will occur. Tolerance is in percent, from 0 to 50.
14134h	ExposureAutoAdjustDelay		[RW]	The auto-exposure adjustment delay, in milliseconds. When the exposure value is out of tolerance, the camera will wait for this amount of time before making an adjustment. If the exposure value comes back into tolerance before this period expires, the adjustment is cancelled. Range is 0 to 10000.
14140h	GainModelInquiry	[1]	[R]	“Manual” gain mode is supported.
		[2]	[R]	“Auto” gain mode is supported.

		[3]	[R] “AutoOnce” gain mode is supported.
		[4]	[R] “External” gain mode is supported.
		[other]	[R] Reserved. All zeros.
14144h	GainMode		[RW] Current gain mode: 1: Manual 2: Auto 3: AutoOnce If mode is set to “AutoOnce”, the mode will automatically switch to “Manual” once auto-gain is complete. When using an automatic mode, the DspSubregion parameters apply.
14148h	GainValueMin		[R] Minimum gain value.
1414Ch	GainValueMax		[R] Maximum gain value.
14150h	GainValue		[R] Current gain value. [W] Set current value, when mode is “Manual”.
14154h	GainAutoMin		[RW] Minimum gain value allowed to be set by the auto-gain function.
14158h	GainAutoMax		[RW] Maximum gain value allowed to be set by the auto-gain function.
1415Ch	GainAutoTarget		[RW] In an automatic-gain mode, this sets the desired mean value of the image data, in percent. In other words, this allows the auto-gain level to be brightened or darkened. Value is from 0 to 100.
14160h	GainAutoRate		[RW] Auto-gain adjustment rate, in percent. Range is 1 (slowest) to 100 (fastest).
14164h	GainAutoOutliers		[RW] Number of top outliers to discard when calculating auto-gain. Value is in percent of the number of pixels in an image, from 0 to 50.
14168h	GainAutoAdjustTol		[RW] The auto-gain tolerance. Once the current gain value is beyond this tolerance from the calculated value, an auto-gain adjustment will occur. Tolerance is in percent, from 0 to 50.
1416Ch	GainAutoAdjustDelay		[RW] The auto-gain adjustment delay, in milliseconds. When the gain value is out of tolerance, the camera will wait for this amount of time before making an adjustment. If the gain value comes back into tolerance before this period expires, the adjustment is cancelled. Range is 0 to 10000.
14180h	WhitebalModelInquiry	[0]	[R] “Calibrated” white balance mode is supported.
		[1]	[R] “Manual” white balance mode is supported.
		[2]	[R] “Auto” white balance mode is supported.
		[3]	[R] “AutoOnce” white balance mode is supported.
		[other]	[R] Reserved. All zeros.

14184h	WhitebalMode		[RW] Current white balance mode: 0: Calibrated 1: Manual 2: Auto 3: AutoOnce If mode is set to “AutoOnce”, the mode will automatically switch to “Manual” once auto-whitebalance is complete. When using an automatic mode, the DspSubregion parameters apply.
14188h	WhitebalValueMin		[R] Minimum white balance value.
1418Ch	WhitebalValueMax		[R] Maximum white balance value.
14190h	WhitebalValueRed		[R] Current red balance value. [W] Set current value, when mode is “Manual”.
14194h	WhitebalValueBlue		[R] Current blue balance value. [W] Set current value, when mode is “Manual”.
14198h	WhitebalAutoAlgInquiry	[0]	[R] “Mean” auto-whitebalance algorithm is supported.
		[other]	[R] Reserved. All zeros.
1419Ch	WhitebalAutoAlg		[RW] Current auto-whitebalance algorithm: 0: Mean
141A0h	WhitebalAutoRate		[RW] Auto-whitebalance adjustment rate, in percent. Range is 1 (slowest) to 100 (fastest).
141A4h	WhitebalAutoOutliers		[RW] Number of top outliers to discard when calculating auto-whitebalance. Value is in percent of the number of pixels in an image, from 0 to 50.
141A8h	WhitebalAutoAdjustTol		[RW] The auto-whitebalance tolerance. Once the current whitebalance value is beyond this tolerance from the calculated value, an auto-whitebalance adjustment will occur. Tolerance is in percent, from 0 to 50.
141ACh	WhitebalAutoAdjustDelay		[RW] The auto-whitebalance adjustment delay, in milliseconds. When the whitebalance value is out of tolerance, the camera will wait for this amount of time before making an adjustment. If the whitebalance value comes back into tolerance before this period expires, the adjustment is cancelled. Range is 0 to 10000.
141C0h	OffsetModeInquiry	[0]	[R] “Calibrated” offset mode is supported.
		[1]	[R] “Manual” offset mode is supported.
		[other]	[R] Reserved. All zeros.
141C4h	OffsetMode		[RW] Current offset mode: 0: Calibrated 1: Manual

141C8h	OffsetValueMin		[R] Minimum offset value.
141CCh	OffsetValueMax		[R] Maximum offset value.
141D0h	OffsetValue		[R] Current offset value. [W] Set current value, when mode is "Manual".
14200h	IrisModelInquiry	[0]	[R] "Disabled" iris mode is supported.
		[1]	[R] "Video" iris mode is supported.
		[2]	[R] "VideoOpen" iris mode is supported.
		[3]	[R] "VideoClosed" iris mode is supported.
		[other]	[R] Reserved. All zeros.
14204h	IrisMode		[RW] Iris mode: 0: Disabled 1: Video 2: VideoOpen 3: VideoClosed The Video mode outputs a video iris signal. The VideoOpen and VideoClosed modes fully open and close the iris.
14208h	IrisAutoTarget		[RW] In an automatic-iris mode, this sets the desired mean value of the image data, in percent. In other words, this allows the auto-iris level to be brightened or darkened. Value is from 0 to 100.
1420Ch	IrisVideoLevelMin		[RW] Minimum video iris level output by the camera. A higher minimum value slows the adjustment time but prevents overshoot. Normally, this register is set during lens calibration, then remains static. Units are approximately mV pp. Value is from 0 to 150.
14210h	IrisVideoLevelMax		[RW] Maximum video iris level output by the camera. A lower maximum value slows the adjustment time but prevents overshoot. Normally, this register is set during lens calibration, then remains static. Units are approximately mV pp. Value is from 0 to 150.
14214h	IrisVideoLevel		[R] Current video-iris level. This value is useful when calibrating a video lens. Units are approximately mV pp. To calibrate a video lens, the len's ALC control should be set to average, and the len's level control should be adjusted such that this register reads between <i>IrisVideoLevelMin</i> and <i>IrisVideoLevelMax</i> . For convenience, we recommend targeting a value of approximately 100.
14240h	DefectMaskInquiry	[0]	[R] Column defect masking is supported.

		[1]	[R] Pixel defect masking is supported.
		[other]	[R] Reserved. All zeros.
14244h	DefectMaskColumnEnable		[RW] Set column defect masking: 0: Disabled (no masking) 1: Enabled
14248h	DefectMaskPixelEnable		[RW] Set pixel defect masking: 0: Disabled (no masking) 1: Enabled
14280h	Engineering Test 1		[RW] These registers do not exist in production firmware.
14284h	Engineering Test 2		
14288h	Engineering Test 3		
1428Ch	Engineering Test 4		
14290h	Engineering Test 5		
14294h	Engineering Test 6		
1429Ch	Engineering Test 7		

Io Control

Address	Name	Bits	Description
15000h	IoControlsInquiry	[0]	[R] Sync-in 1 is available.
		[1]	[R] Sync-in 2 is available.
		[2]	[R] Sync-in 3 is available.
		[3]	[R] Sync-in 4 is available.
		[4]	[R] Sync-out 1 is available.
		[5]	[R] Sync-out 2 is available.
		[6]	[R] Sync-out 3 is available.
		[7]	[R] Sync-out 4 is available.
		[8]	[R] Strobe 1 is available.
		[9]	[R] Strobe 2 is available.
		[10]	[R] Strobe 3 is available.
		[11]	[R] Strobe 4 is available.
		[other]	[R] Reserved. All zeros.
15010h	IoControlsErrorStatus	[0]	[R]
		[other]	[R] Reserved. All zeros.
15100h	BidirInquiry	Determine which sync-in and sync-out lines are shared (i.e. the same bidirectional I/O pin).	
		[0]	[R] Sync-out 1 is shared with sync-in 1.

		[1]	[R]	Sync-out 2 is shared...
		[other]	[R]	Reserved. All zeros.
15104h	BidirDrive	For bidirectional I/O, the drive bit determines whether the I/O line is an input or output. For unidirectional external inputs and sync outputs, the drive bit has no effect.		
		[0]	[RW]	Sync-out-1/sync-in-1 is an output.
		[1]	[RW]	Sync-out-2/sync-in-2...
		[other]	[RW]	Reserved. All zeros.
15110h	SyncInLevels	[0]	[R]	Sync-in 1 input level.
		[1]	[R]	Sync-in 2 input level.
		[2]	[R]	Sync-in 3 input level.
		[3]	[R]	Sync-in 4 input level.
		[other]	[R]	Reserved. All zeros.
15114h	SyncOutLevels	[0]	[R] [W]	Current sync-out 1 level. Set sync-out 1 level, when in GPO mode.
		[1]		sync-out 2 level...
15124h	reserved		[W]	Do not write to this register.
1512Ch	reserved		[W]	Do not write to this register.
15140h	Syncout1ModelInquiry	[0]	[R]	"GPO" sync-out source supported.
		[1]	[R]	"AcquisitionTriggerReady" sync-out source supported.
		[2]	[R]	"FrameTriggerReady" sync-out source supported.
		[3]	[R]	"FrameTrigger" sync-out source supported.
		[4]	[R]	"Exposing" sync-out source supported.
		[5]	[R]	"FrameReadout" sync-out source supported.
		[6]	[R]	"Imaging" sync-out source supported.
		[7]	[R]	"Acquiring" sync-out source supported.
		[8]	[R]	"Sync-in 1" sync-out source supported.
		[9]	[R]	"Sync-in 2" sync-in source supported.
		[10]	[R]	"Sync-in 3" sync-in source supported.
		[11]	[R]	"Sync-in 4" sync-in source supported.
		[12]	[R]	"Strobe 1" sync-out source supported.
		[13]	[R]	"Strobe 2" sync-out source supported.
		[14]	[R]	"Strobe 3" sync-out source supported.
		[15]	[R]	"Strobe 4" sync-out source supported.
		[other]	[R]	Reserved. All zeros.

15144h	Syncout1Mode	[30..0]	[RW] Current source for sync-out 1: 0: GPO 1: AcquisitionTriggerReady 2: FrameTriggerReady 3: FrameTrigger 4: Exposing 5: FrameReadout 6: Imaging (Exposing or FrameReadout) 7: Acquiring 8: Sync-in 1 9: Sync-in 2 10: Sync-in 3 11: Sync-in 4 12: Strobe 1 13: Strobe 2 14: Strobe 3 15: Strobe 4
		[31]	[RW] Invert sync-out signal, when 1.
15148h	Syncout2ModelInquiry		[R] See <i>Syncout1ModelInquiry</i> .
1514Ch	Syncout2Mode		[RW] See <i>Syncout1Mode</i> .
15150h	Syncout3ModelInquiry		[R] See <i>Syncout1ModelInquiry</i> .
15154h	Syncout3Mode		[RW] See <i>Syncout1Mode</i> .
15158h	Syncout4ModelInquiry		[R] See <i>Syncout1ModelInquiry</i> .
1515Ch	Syncout4Mode		[RW] See <i>Syncout1Mode</i> .
15160h	StrobeDelayMax		[R] Maximum strobe delay and strobe duration values.
15170h	Strobe1ModelInquiry	[1]	[R] "AcquisitionTriggerReady" strobe source supported.
		[2]	[R] "FrameTriggerReady" strobe source supported.
		[3]	[R] "FrameTrigger" strobe source supported.
		[4]	[R] "Exposing" strobe source supported.
		[5]	[R] "FrameReadout" strobe source supported.
		[7]	[R] "Acquiring" strobe source supported.
		[8]	[R] "Sync-in 1" strobe source supported.
		[9]	[R] "Sync-in 2" strobe source supported.
		[10]	[R] "Sync-in 3" strobe source supported.
		[11]	[R] "Sync-in 4" strobe source supported.
		[other]	[R] Reserved. All zeros.

15174h	Strobe1Mode	[30..0]	[RW] Current strobe source: 1: AcquisitionTriggerReady 2: FrameTriggerReady 3: FrameTrigger 4: Exposing 5: FrameReadout 7: Acquiring 8: Sync-in 1 9: Sync-in 2 10: Sync-in 3 11: Sync-in 4
		[31]	[RW] Controlled duration, when 1.
15178h	Strobe1Delay		[RW] Strobe delay (from start event), in microseconds.
1517Ch	Strobe1Duration		[RW] Strobe pulse width, in microseconds. Applicable in controlled duration mode.
15180h	Strobe2ModelInquiry		[R] See <i>Strobe1ModelInquiry</i> .
15184h	Strobe2Mode		[RW] See <i>Strobe1Mode</i> .
15188h	Strobe2Delay		[RW] See <i>Strobe1Delay</i> .
1518Ch	Strobe2Duration		[RW] See <i>Strobe1Duration</i> .
15190h	Strobe3ModelInquiry		[R] See <i>Strobe1ModelInquiry</i> .
15194h	Strobe3Mode		[RW] See <i>Strobe1Mode</i> .
15198h	Strobe3Delay		[RW] See <i>Strobe1Delay</i> .
1519Ch	Strobe3Duration		[RW] See <i>Strobe1Duration</i> .
151A0h	Strobe4ModelInquiry		[R] See <i>Strobe1ModelInquiry</i> .
151A4h	Strobe4Mode		[RW] See <i>Strobe1Mode</i> .
151A8h	Strobe4Delay		[RW] See <i>Strobe1Delay</i> .
151ACh	Strobe4Duration		[RW] See <i>Strobe1Duration</i> .

SerialIo Control

Address	Name	Bits	Description
16000h	SerialIoInquiry	[0]	[R] Serial IO transmitter is available.
		[1]	[R] Serial IO receiver is available.
		[2]	[R] Serial IO receiver has timestamp mode.
		[other]	[R] Reserved. All zeros.
16010h	SerialIoErrorStatus	[other]	[R] Reserved. All zeros.
16100h	SerialModelInquiry	[0]	[R] 300 baud supported.
		[1]	[R] 600 baud supported.
		[2]	[R] 1200 baud supported.

		[3]	[R] 2400 baud supported.
		[4]	[R] 4800 baud supported.
		[5]	[R] 9600 baud supported.
		[6]	[R] 19200 baud supported.
		[7]	[R] 38400 baud supported.
		[8]	[R] 57600 baud supported.
		[9]	[R] 115200 baud supported.
		[10]	[R] 230400 baud supported.
		[16]	[R] No parity supported.
		[17]	[R] Odd parity supported.
		[18]	[R] Even parity supported.
		[20]	[R] Character length 5 bits supported.
		[21]	[R] Character length 6 bits supported.
		[22]	[R] Character length 7 bits supported.
		[23]	[R] Character length 8 bits supported.
		[24]	[R] 1 stop bit supported.
		[25]	[R] 1.5 stop bits supported.
		[26]	[R] 2 stop bits supported.
		[other]	[R] Reserved. All zeros.
16104h	SerialMode	[7..0]	[RW] Baud rate: 0: 300 1: 600 2: 1200 3: 2400 4: 4800 5: 9600 6: 19200 7: 38400 8: 57600 9: 115200 10: 230400
		[9..8]	[RW] Parity: 0: None 1: Odd 2: Even

		[11..10]	[RW] Character length: 0: 5 bits 1: 6 bits 2: 7 bits 3: 8 bits
		[13..12]	[RW] Stop bits: 0: 1 stop bit 1: 1.5 stop bits 2: 2 stop bits
		[other]	[R] Reserved. All zeros.
16120h	SerialTxInquiry	[15..0]	[R] Transmitter buffer size, in bytes.
		[other]	[R] Reserved. All zeros.
16124h	SerialTxStatus	[0]	[R] Transmitter ready.
		[other]	[R] Reserved. All zeros.
16128h	SerialTxControl	[0]	[W] Transmitter reset when 1. Occurs immediately. [R] Always zero.
		[1]	[RW] Transmitter enable, when 1.
		[other]	[R] Reserved. All zeros.
1612Ch	SerialTxLength	[15..0]	[W] Transmit data length, in bytes. When this is written, the data in <i>SerialTxBuffer</i> is sent through the serial port. <i>SerialTxLength</i> may not be written if “ <i>Transmitter Ready</i> ” is zero. [R] Always zeros.
		[other]	[R] Reserved. All zeros.
16140h	SerialRxInquiry	[15..0]	[R] Receiver buffer size, in bytes.
		[other]	[R] Reserved. All zeros.
16144h	SerialRxStatus	[0]	[R] Receive overrun. [W] Write 1 to clear.
		[1]	[R] Receive framing error. [W] Write 1 to clear.
		[2]	[R] Receive parity error. [W] Write 1 to clear.
		[other]	[R] Reserved. All zeros.
16148h	SerialRxControl	[0]	[W] Receiver reset when 1. Occurs immediately. [R] Always zero.
		[1]	[RW] Receiver enable, when 1.

		[2]	[RW] Enable timestamp mode. See <i>SerialRxBuffer</i> for a description of timestamp mode. (Don't change this bit on the fly, otherwise some data will be timestamped and some will not.) Check <i>SerialInquiry</i> to see if this feature is available.
		[other]	[R] Reserved. All zeros.
1614Ch	SerialRxLength	[15..0]	[R] Number of bytes in the receive buffer. [W] Number of bytes read from receive buffer. The counter (see [R] above) is decremented by this amount.
16400h	SerialTxBuffer		[W] Transmit buffer. Write your data into the buffer, then write your data length into <i>SerialTxLength</i> to begin transmission. Each serial word is stored as a byte, LSBit aligned. The bytes are packed into 32-bit registers; the MSByte of each register is the first serial-word transmitted. (When the data length is not a multiple of 4, trailing bytes are ignored.) ex. write 0x41424344 to output "ABCD" <i>SerialTxBuffer</i> may not be written if " <i>Transmitter Ready</i> " is zero.
16800h	SerialRxBuffer		[R] Receive buffer. Read data from this buffer. Read <i>SerialRxLength</i> for the number of valid bytes in this receive buffer. After reading the data, you must write the length of your read to <i>SerialRxLength</i> . See <i>SerialTxBuffer</i> for data packing. Timestamp mode: each received byte is proceeded by 8 timestamp bytes, MSB first. This timestamp is the frame timestamp. ex. 0x11223344AABBCCDD41 is "A" received at timestamp 0x11223344AABBCCDD

Memory Control

Address	Name	Bits	Description
17000h	MemoryInquiry	[0]	[R] Memory files - to save camera state - are available.
		[1]	[R] User-defined memory is available.
		[other]	[R] Reserved. All zeros.
17100h	MemoryFileCount		[R] Number of memory files supported.
17104h	MemoryCommand	[15..0]	[W] File number, from 0 to <i>MemoryFileCount</i> -1. File 0 is factory defaults and cannot be changed.
			[R] Last value written.

		[31..16]	[W] Execute memory command: 0: No action 1: Load settings from file 2: Save settings to file [R] Always zero.
17108h	MemoryFileDefault		[R] File loaded on power-up or reset. [W] Change the default file. This value is saved to non-volatile memory.
17200h	MemoryUserDefined		[R] Read user-defined memory, up to 512 bytes. The user-defined memory is factory initialized to all zeros. [W] Write user-defined memory, up to 512 bytes. (If less than 512 bytes is written, the remainder is zero filled.) The read or write must start at address 17200h.

Calibration Control

Address	Name	Bits	Description
18000h	CalibrationInquiry	[0]	[R] Tap2 calibration controls exist.
		[other]	[R] Reserved. All zeros.
18100h	Tap2OffsetAdjust	[15..0]	[W] Offset adjustment (when command=0). A signed value.
		[31..24]	[W] Tap-2 offset calibration command: 0: Set tap2 offset adjustment (for current gain) 1: End adjustment (restore defaults) 2: End adjustment and save results
18104h	Tap2GainAdjust	[15..0]	[W] Gain adjustment (when command=0). A signed value.
		[31..24]	[W] Tap-2 gain calibration command: 0: Set tap2 gain adjustment (for current gain) 1: End adjustment (restore defaults) 2: End adjustment and save results

Defect Tables

Address	Name	Bits	Description
19000h	DefectInquiry	[0]	[R] Column defect table exists.
		[other]	[R] Reserved. All zeros.
19100h	ColumnDefectNumMax		[R] The maximum number of defects allowed in the column defect table.
19104h	ColumnDefectNum		[R] The number of defects in the current column defect

			table.
19108h	ColumnDefectTable		<p>[R] The column defect table.</p> <p>[W] This table must be written with a single WRITEMEM_CMD, starting at this address.</p> <p>The defect table must be in column order. Only one correction is allowed for a given column.</p> <p>The table is an array of 16-bit unsigned integers (big-endian), where each defect consumes 3 short words:</p> <p style="margin-left: 40px;">short 1: defect 1, y (column)</p> <p style="margin-left: 40px;">short 2: defect 1, x-start</p> <p style="margin-left: 40px;">short 3: defect 1, x-end</p> <p style="margin-left: 40px;">short 4: defect 2, y (column)</p> <p style="margin-left: 40px;">short 5: defect 2, x-start</p> <p style="margin-left: 40px;">short 6: defect 2, x-end</p> <p style="margin-left: 40px;">etc...</p> <p>Padding may be required at the end of the table, so the WRITEMEM_CMD size is divisible by 4.</p> <p>To clear the table, write a correction of {0, 0, 0} into the first defect.</p>

Registry Data Access

Address	Name	Bits	Description
20000h	RegistryInquiry	[0]	[R] Registry data access exists. These registers are intended for Prosilica's internal use.
		[other]	[R] Reserved. All zeros.
20100h	RegistryKey		[RW] The registry key to read or write, when accessing RegistryData registers. Key value 0 is special: this lets you read the master key table.
20104h	RegistryData		<p>[RW] Access registry data, using the key set in RegistryKey. Access must occur with a single WRITEMEM_CMD or READMEM_CMD, starting at this address. These registers are intended for Prosilica's internal use during manufacturing.</p> <p style="margin-left: 40px;">word 1 [R]: length of data, in quadlets; length is zero if key data not initialized</p> <p style="margin-left: 40px;">word 1 [W]: other</p> <p style="margin-left: 40px;">word 2: key data, quadlet 1</p> <p style="margin-left: 40px;">word 3: key data, quadlet 2</p> <p style="margin-left: 40px;">etc...</p>

User-Loaded Library

Address	Name	Bits	Description
21000h	UserLibInquiry	[0]	[R] User Library functionality exists.

		[other]	[R] Reserved. All zeros.
21010h	UserLibRomStart		[R] Address of User Library read-only space. Your program runs from this address. (I.e. link your .text and .rodata sections to run from here.) This value is guaranteed to be constant per firmware version (for same models).
21014h	UserLibRomSize		[R] Size of User Library read-only space, in bytes. This value is guaranteed to be constant per firmware version (for same models).
21018h	UserLibRamStart		[R] Address of User Library data space. This is the RAM reserved for your program's data and stack. (I.e. link your .data and .bss sections to run from here. Your stack starts at the top of RAM.) This value is guaranteed to be constant per firmware version (for same models).
2101Ch	UserLibRamSize		[R] Size of User Library data space, including stack, in bytes. This value is guaranteed to be constant per firmware version (for same models).
21100h	UserLibCodeStatus		[R] Status of User Library code: 1: User library is loaded and ready 100: User library does not exist 101: User library file type is unsupported 102: User library is corrupt 103: Version change; user library must be reloaded
21104h	UserLibControl		[RW] Query and control current execution status: 0: Stopped (Stop) 1: Running (Run)
21108h	UserLibResult		[R] Result of last execution: 0: None 1: Stopped at end of program 2: Stopped by user 100: Terminated; bad API call 101: Terminated; too much CPU time 102: Terminated; bad code instruction 103: Terminated; bad data access 104: Terminated; stack overflow Result is set to None when execution starts.
21120h	UserLibStackSize		[R] Total stack available, in bytes. (Reads 0 if User Library is not loaded and ready.)
21124h	UserLibStackUsed		[R] The peak amount of stack used, in bytes, since the last execution start. If this value equals <i>UserLibStackSize</i> , the stack overflowed.

21200h	UserLibUpload		<p>[W] Erase, upload, and verify User Library.</p> <p>Access must occur with a single WRITEMEM_CMD, starting at this address.</p> <p>Word 1: Upload command</p> <p>Word 2: Address (word boundary)</p> <p>Word 3: First data word</p> <p>Word 4: Second data word</p> <p>etc...</p> <p>These are the Upload commands:</p> <p>1: Erase library</p> <p>2: Write data</p> <p>3: Verify data</p> <p>When the "erase library" command is run, WRITEMEM_CMD will return when the library is erased.</p> <p>When the "write data" command is run, the data is programmed into flash if the flash is erased. GEV_STATUS_ACCESS_DENIED is returned if the flash is not erased.</p> <p>When the "verify data" command is run, GEV_STATUS_ACCESS_DENIED is returned if the User Library contents do not match your data. (A verify operation will not impact the flash memory's lifespan.)</p>
21500h.. 215FCh	UserLibRegs		<p>[RW] Access to these registers is passed to the User Library. You may use this register space as you please. GEV_STATUS_ACCESS_DENIED is returned if the User Library is not running.</p>

Obsolete Trigger Control – Firmware 1.22 and earlier

These registers exist when bit 1 of AcqControlInquiry is set.

13120h	TriggerModelInquiry	[0]	[R] “Freerun” trigger mode is supported.
		[1]	[R] “Syncln1” trigger mode is supported.
		[5]	[R] “FixedRate” trigger mode is supported.
		[6]	[R] “Software” trigger mode is supported.
		[other]	[R] Reserved. All zeros.
13124h	TriggerMode		[RW] Current trigger mode: 0: Freerun 1: Syncln1 5: FixedRate 6: Software
13130h	FixedRateMin		[R] Minimum fixed rate generator value, in microseconds between triggers.
13134h	FixedRateMax		[R] Maximum fixed rate generator value, in microseconds between triggers.
13138h	FixedRateValue		[RW] Fixed rate trigger generator, in microseconds between triggers. Relevant when trigger mode is “FixedRate”. If this value is below <i>FixedRateMin</i> , the actual frame rate will be undefined.
13140h	ExternalTriggerEvent		[RW] Trigger event, when trigger mode is external input: 0: EdgeRising 1: EdgeFalling 2: EdgeAny 3: LevelHigh 4: LevelLow
13144h	ExternalTriggerDelayMax		[R] Maximum external trigger delay, in microseconds.
13148h	ExternalTriggerDelay		[RW] Delay between external trigger event and start of exposure, in microseconds.
13150h	SoftwareTrigger	[0]	[W] Software trigger: 1=trigger.
			[R] Software trigger status: 1=in progress.