Allied Vision

GigE Vision Cameras

Prosilica GT

Technical Manual

V2.7.0

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

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Prosilica GT at a glance

Prosilica GT cameras have a Gigabit Ethernet (GigE) interface and work with Gigabit Ethernet hardware and cable lengths up to 100 m. Prosilica GT cameras are GigE Vision V1.2 and GenICam SFNC V1.2.1 compliant.

Applied standards

GigE Vision®

The GigE Vision standard is an interface standard for digital machine vision cameras administered by the Automated Imaging Association (AIA) that is widely supported in the machine vision industry. In contrast, Gigabit Ethernet is the network GigE Vision is built upon.

GenICam™

GenICam is a machine vision standard hosted by the European Machine Vision Association (EMVA). The aim of GenICam is to provide a generic configuration interface for cameras and devices independent of the used interface technology (i.e. GigE Vision, USB3 Vision, 1394 DCAM, Camera Link). This approach enables proper interoperability between GenICam compliant hardware and software solutions without the need for customization.

The GenICam standard consists of multiple modules that specify tasks to be solved. Allied Vision cameras and software make use of these modules, like the Standard Feature Naming Convention (SFNC) that standardizes feature names and types via an XML file or the transport layer interface (GenTL) that is used to grab images.

What else do you need?

Content	URL
Camera data sheets GigE Installation Manual GigE Features Reference Modular Concept 3D CAD STEP files Software and firmware downloads	https://www.alliedvision.com/en/support/technical-documentation/prosilica-gt-documentation.html
Technical papers and knowledge base	https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html

Read this manual carefully

Learn how to protect your camera from damage and fully understand its functions.

Contact us

Connect with Allied Vision by function

https://www.alliedvision.com/en/meta-header/contact.html

Find an Allied Vision office or Allied Vision distributor

https://www.alliedvision.com/en/about-us/where-we-are.html

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Contents

Document history and conventions

This chapter includes:

- Document history
- Layout styles and symbols used in this manual

Document history

Version	Date	Remarks
V2.0.0	2011-Dec-12	New manual release status
V2.0.1	2012-Mar-08	Added absolute QE plots Added Prosilica GT1910, GT1920, GT2300, and GT2750 frame rate charts
V2.0.2	2012-May-31	Added Prosilica GT3300 and GT1660
V2.0.3	2012-Jun-21	Added DC iris information
V2.0.4	2012-Sep-21	Added Prosilica GT2000, GT2050, and GT6600 Link added to RS232 application note Added lens control port wiring Renamed camera IO signals
V2.0.5	2013-Jan-14	Added Prosilica GT3400, GT4100, GT4905, and GT4907 Updated the circuits diagrams in the camera trigger section Updated the Prosilica GT trigger circuit values Removed the supported P-Iris section Updated the exposure control values
V2.0.6	2013-Feb-12	Added status LEDs section Updated the RoHS directive
V2.0.7	2013-May-16	Updated the bit depth and exposure control camera specifications in the *Specifications* chapter Updated pixel format naming according to the GenICam naming convention Corrected body dimensions and mass for Prosilica GT3400 Corrected the absolute QE plot for Prosilica GT3400 Added Vimba SDK link Added frame rate vs. height graphs for Prosilica GT3400, GT4905, and GT4907 Updated frame rate vs. height graphs in *Specifications* chapter Updated Allied Vision recommended cabling to Category 6 or higher in Gigabit Ethernet port section
V2.0.8	2013-Jul-05	Updated the absolute QE plot for Prosilica GT1910 Updated the links to Allied Vision *GigE Installation Manual* Added links to Allied Vision *GigE Camera and Driver Features* document
V2.0.9	2013-Sep-16	Updated the *Mechanical dimensions* chapter Updated Lens control section Updated color cameras with IR cut filter section Updated the specifications for Prosilica GT2000C and GT2050C Added a note on the locking screw cables Added optical flange focal distance and maximum lens protrusion information for C-Mount and F-Mount Added 1 inch lens format recommendation for Prosilica GT2000 cameras Added temperature monitoring information in the *Specifications* chapter Updated specifications for Prosilica GT2000, GT2000C, GT2000NIR and GT2050, GT2050C, and GT2050NIR cameras Added frame rate tables in the *Specifications* chapter

Table 1: *Document history*

Version	Date	Remarks
V2.1.0	2013-Oct-28	Added Description of the data path chapter Added section Adjustment of F-Mount
V2.1.1	2014-Jul-14	Updated frame rate specification for Prosilica GT2000, GT2000C, GT2000NIR, GT2050, GT2050C, GT2050NIR, GT3400, GT3400C, GT4905, and GT4905C Added defect mask note in block diagram of Prosilica GT monochrome cameras with CCD sensors and block diagram of Prosilica GT color cameras with CCD sensors Corrected the sensor and cell size for Prosilica GT6600, GT6600C Added a note on binning in block diagram of Prosilica GT color cameras with CCD sensors Added link to the technical dRAWing for Prosilica GT large format camera with M42-Mount and M58-Mount Updated sensor position accuracy section Updated minimum exposure time for Prosilica GT2000, GT2000C, GT2000NIR and GT2050, GT2050C, and GT2050NIR Updated specifications for Prosilica GT4905 and GT4905C Updated the power consumption specification in the *Specifications* chapter Replaced the optical flange focal distance section with the following sections: - C-Mount flange focal distance - F-Mount flange focal distance Updated information on Prosilica GT Out 3 / Out 4 trigger circuit on page 90 and in section Output: Opto-isolated internal circuit Updated temperature monitoring information in the *Specifications* chapter Preliminary camera Prosilica GT4100 removed from the document until samples are available Updated filter and lenses section Replaced A/D and bit depth with Max image bit depth in the *Specifications* chapter Added M42-Mount technical dRAWing links for Prosilica GT standard and extended cameras
V2.2.0	2015-Mar-11	Updated Allied Vision logo Changed AVT and Allied Vision Technologies references to Allied Vision Updated additional references section Added new camera model Prosilica GT1930L: - Prosilica GT1930L and GT1930LC specifications - Dimensions of GT1930L with EF-Mount (Planarity adjustable) - Adjustment of EF-Mount information - Description of data path for GT1930L - EF lens control section - Frame rate vs ROI height graph for GT1930L Added Prosilica GT3300 with ON Semiconductor KAI-08051 sensor information Renamed Truesense references to ON Semiconductor Updated Lens control port wiring Updated temperature monitoring specification for Prosilica GT2300, GT2300C Updated data path diagrams for color Prosilica GT cameras in *Description of the data path* section Updated the defect masking information for the following: - Prosilica GT monochrome cameras - Prosilica GT color cameras
V2.3.0	2015-Mar-20	Replaced old links with new Allied Vision website links Changed file name from *GigE Camera and Driver Features* to *GigE Features Reference* Changed chapter name from *Description of data path* to *Camera data path*

Table 1: *Document history (continued)*

Version	Date	Remarks
V2.4.0	2015-Aug-25	Updated color formats specification in *Specifications* chapter Updated camera I/O connector pin assignment, Input triggers and output signals sections Added camera feature comparison section to replace 'Camera smart features' section of V2.3.0
V2.4.1	2015-Sep-15	Added a note on removal of 4.75 KΩ resistors from PCBA in Out 3 and 4 in Opto-isolated section
V2.5.0	2015-Dec-21	Changed the technical manual layout. Changed chapter name from *Camera data path* to *Image data flow* and updated the figures. Changed chapter name from *Camera dimensions* to *Mechanical dimensions*. Merged the *Resolution and ROI frame rates* chapter into *Specifications* chapter. Added Prosilica GT at a glance section Added General safety notes section Added Legislation section in *Safety and legislation* chapter to replace 'Legal notice' and 'Conformity' sections Moved 'Sensor position accuracy' section from Appendix to *Mechanical dimensions* chapter and deleted 'Appendix' Added Camera features comparison section in *Specifications* chapter to replace 'Camera smart features' and 'Camera features' sections Added *Cleaning optical components* chapter to replace *Camera cleaning* and updated information Added *Contact us* section to replace *Contacting Allied Vision* section Updated Prosilica GT large format lens mount dRAWings
V2.6.0	2016-Mar-04	Added new models: Prosilica GT1930 and GT1930C Updated compliance statements Various minor corrections Added installation chapter
V2.7.0	2016-May-11	Changed all instances of RegionY to OffsetY Changed all instances of BinningY to BinningVertical Aligned the information in the specification tables with the information on the web pages New features for various GT models including: • Decimation X/Y • Sensor digitization taps Added sensor tap mode note in *Specifications* chapter Updated frame rate information plots Various other minor improvements and corrections

Table 1: *Document history (continued)*

Manual conventions

To give this manual an easily understood layout and to emphasize important information, the following sections show typographical styles and symbols are used.

Styles

Style	Function	Example
Bold	Program names, UI elements, highlighting important things	**bold**
Italics	Publication names, UI non-interactive elements	*Italics*
Courier New	Code listings, feature names	`Input`
Courier New Italics	Feature options	*`Mode`*
Blue	Cross references, web page links, email links	Link

Symbols

Safety note

Note to prevent physical injury.

Possible material damage

This symbol addresses important information to avoid material damage; however, is not related to physical injury.

Damage to the camera by electrostatic discharge (ESD)

This symbol addresses important information to avoid material damage by ESD.

Safety related instructions to avoid malfunctions

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

Practical hint

This symbol highlights a practical hint that helps to better understand the camera‘s features and functions, and to make better use of it.

Further information available online

This symbol highlights URLs for further information. The URL itself is shown in blue. Example:

https://www.alliedvision.com

Safety and regulations

This chapter includes:

- General safety notes for Prosilica GT cameras
- Information about the legal requirements and restrictions for Prosilica GT cameras based on current and relevant legislation
- Particular emphasis has been given to legislation of the European Economic Area (CE, RoHS, WEEE) as well as legislation of the United States of America (FCC) and Canada (ICES)

General safety notes

Avoid damage to the camera by ESD

Inadequate protection of the camera from ESD can damage the camera permanently. Read the safety instructions and ESD warnings in the GigE Installation Manual.

Do not exceed environmental specifications

See environmental specifications limits in the *Specifications* chapter of this document. Special care must be taken to maintain a reasonable operating temperature. If the camera is operated in temperatures higher than the specified range, the camera should be mounted on a heat sink.

For more information, see the *Prosilica GT Camera Body Temperature* application note:

https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html

Verify all external connections

Verify all external connections in terms of voltage levels, power requirements, voltage polarity, and signal integrity prior to powering the device.

Do not disassemble the camera housing

This camera contains sensitive internal components. The warranty is void if the camera is disassembled.

Keep shipping material

Poor packaging of the product may cause damage during shipping.

Cleaning optical components

This product can be damaged by some volatile cleaning agents. Avoid cleaning the image sensor unless absolutely necessary. Please see instructions on optics cleaning in this document.

Allied Vision can clean your camera as a service for you, if necessary. For more information, contact Allied Vision support.

Regulations

European Economic Area requirements

CE and RoHS

Allied Vision Technologies declares under its sole responsibility that all standard cameras of the Prosilica GT family to which this declaration relates are in conformity with the following standard(s) or other normative document(s):

- CE, following the provisions of 2004/108/EC directive
  (Prosilica GT board level cameras do not have CE)
- RoHS (2011/65/EU)

WEEE

This product must be disposed of in compliance with the directive 2002/96/EC on waste electrical and electronic equipment (WEEE).

FCC – Class A Device

For customers in the U.S.A.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interferences will not occur in a particular installation. If the equipment does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Use a different line outlet for the receiver.
- Consult a radio or TV technician for help.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment. The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart A of Part 15 of FCC Rules.

Industry Canada Equipment Standard for Digital Equipment (ICES)

CAN ICES-003 (A) / NMB-3 (A)

For customers in Canada

This apparatus complies with the Class A limits for radio noise emissions set out in the Radio Interference Regulations.

Pour utilisateurs au Canada

Cet appareil est conforme aux normes classe A pour bruits radioélectriques, spécifiées dans le Règlement sur le brouillage radioélectrique.

Life support applications

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Allied Vision Technologies customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Allied Vision Technologies for any damages resulting from such improper use or sale.

Other legal notices

Trademarks

Unless stated otherwise, all trademarks shown in this document of Allied Vision Technologies are brands protected by law. All other product or company names may be trademarks of their respective owners.

Warranty

The information provided by Allied Vision Technologies is supplied without any guarantees or warranty whatsoever, be it specific or implicit. Also excluded are all implicit warranties concerning the negotiability, the suitability for specific applications or the non-breaking of laws and patents. Even if we assume that the information supplied to us is accurate, errors and inaccuracy may still occur.

Copyright

All texts, pictures and graphics are protected by copyright and other laws protecting intellectual property. It is not permitted to copy or modify them for trade use or transfer, nor may they be used on websites.

For the latest version of this document, please visit our documentation website.

Installation and hardware

This chapter describes the components required for your vision system including configuring the host computer, Ethernet adapter settings, and connecting your Prosilica GT camera.

Configuring the host computer

Allied Vision GigE Vision cameras can operate on 10/100 or Gigabit speed Ethernet adapters. In order to reach the maximum camera frame rate, a Gigabit speed Ethernet adapter with jumbo packet support is required.

If your host computer has an available Ethernet interface, this can be used with Allied Vision GigE cameras. We recommend that your camera system uses a dedicated Ethernet interface not shared with Internet or local area networks. If more ports are needed, or your existing Ethernet adapter is unable to operate at Gigabit Ethernet speeds, installing additional hardware may be required.

Usage on mixed-use networks (with printers, Internet/email, etc.) is possible but may impact camera performance (e.g., framerate). Please check with your IT administrator if required for network configuration.

Installing the Ethernet adapter driver

Install the network card driver from your network card manufacturer. If no installation application is provided, update the driver manually.

To update the driver manually

1. Click the **Start icon** and select *Control Panel* in the menu.
2. Click **View by Large Icons** and select *Device Manager* in the list.
3. Under *Network Adapters*, locate the Ethernet network adapter, right-click the entry, and select *Update Driver Software* in the menu.
4. Select the *Search automatically for updated driver software* or *Browse my computer for driver software*.
5. Click **Close** once the driver has been installed.

Optional: Modifying Ethernet adapter IP address

After initial Ethernet adapter hardware installation, connect the Ethernet adapter directly to the camera. The default configuration assigns an IP address automatically using the Link-Local Address range of 169.254.xxx.xxx or an address defined by the DHCP server, if present.

Users can fix the adapter address to minimize the time required for a camera to be recognized by the host application. Systems that employ multiple Ethernet adapters connected to multiple cameras will also be required to fix the address of the Ethernet adapter.

To connect to the camera, edit the host PC's adapter settings and configure the following settings:

- IP Address: 169.254.100.1
- Subnet mask: 255.255.0.0
- Default gateway: blank

Ethernet adapter driver settings

The Ethernet adapter should be adjusted to improve system performance when using a GigE Vision camera. This performance is related to minimizing CPU usage and dropped or resent packets.

Edit the Ethernet adapter driver properties according to the values in the table below. The names and availability of the properties listed may vary depending on adapter manufacturer and model.

Property	Value
Packet size (MTU)	8228 or larger
Interrupt Moderation	Enable
Interrupt Moderation Rate	Extreme
Receive Buffers	Maximum value configurable
Transmit Buffers	256

Default packet size

The default packet size of Allied Vision GigE cameras is 8228 bytes. The host network adapter needs to support a packet size of equal or larger size to stream from the camera.

Ethernet adapter

For desktop systems, use a PCI Express bus Ethernet adapter. For laptops, use an expansion slot via an ExpressCard®.

A list of Allied Vision recommended Ethernet adapters is available on the Allied Vision website. See the Hardware Selection for Allied Vision GigE Cameras application note:

https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html

Ethernet adapter settings

The Ethernet adapter settings may also vary depending on your system configuration and the network adapter manufacturer.

Enabling jumbo packets

Jumbo Frames/Jumbo Packets

The properties listed for the network adapter may include either Jumbo Packet or Jumbo Frames depending on the manufacturer. If neither is listed under properties, your network card may not support this feature. You must use a network adapter that supports Jumbo Frames/Jumbo Packets.

To enable jumbo packets

1. Click the **Start** icon and select *Control Panel* in the menu.
2. Click **View by Large Icons** and select *Device Manager* in the list.
3. Under *Network Adapters*, locate the Ethernet network adapter, right-click the entry, and select *Properties* in the menu.
4. Select the *Advanced* tab.
5. Select the property *Jumbo Packet* and set the value to *9014 Bytes*.
6. Click **OK** to save the setting.

Connecting your camera

Use a category 6 or higher rated Ethernet cable to connect the camera to the host adapter. Crossover cabling is not required but does work. The camera has circuitry to determine if a crossover cable is being used.

Allied Vision recommends category 6 (Cat 6) or higher rated Ethernet cables. A different rating may not sustain peak interface bandwidth; leading to lost connectivity or image data coming from the camera.

Please contact your Allied Vision sales representative or your local Allied Vision dealer for information on accessories:

https://www.alliedvision.com/en/about-us/where-we-are.html

Contact your Allied Vision Sales representative or your local Allied Vision distributor for lens recommendations:

https://www.alliedvision.com/en/meta-header/contact/contact-sales

Downloading camera drivers

Allied Vision GigE cameras work with any or all of the following software options.

Vimba Viewer or Vimba SDK:

https://www.alliedvision.com/en/products/software

Third-party software solutions:

https://www.alliedvision.com/en/products/software/third-party-libraries.html

Powering up the camera

A camera power adapter for each GigE camera is available from Allied Vision. Please see *Specifications* on page 24 for connector definition and voltage specifications.

For Prosilica GT cameras

- Use only DC power supplies with insulated cases.
- For all power connections use only shielded cables to avoid electromagnetic interferences.
- Prosilica GT cameras can source power from:
  - IEEE 802.3af (100 MBit/s and 1000 MBit/s), and
  - IEEE 802.3at compliant PoE power sourcing equipment (PSE) devices such as switches, injectors, or network interface controller (NIC)

Connecting to host application

Once you have installed the **Vimba Viewer** or third-party application to your host computer, you can connect your Allied Vision GigE camera via an Ethernet cable. If your camera is not PoE powered, connect the Hirose cable to power the camera.

GigE Installation Manual

For information on starting your camera and connecting to a host application, see the GigE Installation Manual:

https://www.alliedvision.com/en/support/technical-documentation/prosilica-gt-documentation.html

Allied Vision recommends category 6 (Cat 6) or higher rated Ethernet cables. A different rating may not sustain peak interface bandwidth; leading to lost connectivity or image data coming from the camera.

Vimba Viewer documentation

Vimba Viewer documentation is included with the software download. Once Vimba Viewer is installed on your host PC, documentation is located under *\Program Files\Allied Vision\Vimba*.

Specifications

This chapter provides:

- Technical specifications
- Absolute quantum efficiency plots
- ROI height vs. frame rate plots
- Comparison of feature availability in various Prosilica GT camera models

Notes on specifications

Dimensions and mass

Dimensions include connectors but not the tripod and lens.

Mass does not include the tripod and lens.

Maximum power via PoE

The maximum power supplied via PoE is 13 W. EF lens power requirements will vary from lens to lens; however, typical ratings are in the 3 to 4 W range.

Should your lens plus camera power requirements exceed 13 W, it will be necessary to power the camera via Hirose I/O port.

Mono8

Prosilica GT color models include the Mono8 monochrome pixel format in addition to color and RAW formats.

Frame memory

Normally, an image is captured and transported in consecutive steps. The image is taken, read out from the sensor, digitized and sent over the GigE network. Prosilica GT cameras are equipped with an image buffer. The memory operates according to the first in, first out (FIFO) principle. Specification tables show how many frames can be stored by each model.

Number of frames

The number of frames (`StreamHoldCapacity`) depends on resolution, pixel format, and GVSP packet size. The stated number of frames is typical for full resolution, Mono8/Bayer8, and a `GevSCPSPacketSize` = *8192* bytes per packet.

Resolution and ROI frame rate

Resolution and ROI frame rate is listed after the specification table. The resulting frame rate from changing sensor height from full image to a single line. Unless otherwise noted, sensors do not give an increase in readout speed with a reduction in width. However, in cases where a camera is limited by frame rate due to bandwidth restrictions, a reduction in width will give a frame rate increase.

Cameras with a “burst mode” frame rate are able to output more data than the maximum available bandwidth (124 MB/s), and will see a frame rate increase with a reduction in width.

Resolution and ROI measurements

- Data was generated using `StreamBytesPerSecond` = `124` MB/s (full bandwidth), minimum exposure, full resolution, and an 8-bit pixel format. Frame rate may be lower if using network hardware incapable of 124 MB/s.
- For maximum speed advantage on quad-tap CCD sensors, ROIs are center image, where feature `OffsetY` = (full sensor height – ROI height)/2.
- `BinningVertical` is vertical row summing of charge on CCD sensors before readout. The frame rate for an ROI at the same effective height as binning is slower because the CCD still needs to read out the “fast readout rows” in ROI mode.

Sensor tap mode

With four-tap sensor mode you can achieve a higher frame rate than one-tap mode. With one-tap sensor mode you can achieve an image certain to be free of any tap-boundary artifacts. You can also use one-tap mode if you experience tap imbalance issues with your camera. You can change the sensor digitization tap mode in Vimba Viewer 2.0 or later.

Image acquisition must be stopped before changing sensor tap mode.

Affected features

This table lists features which are affected when switching from four-tap to one-tap sensor mode.

Feature	Four-tap mode	One-tap mode
Reverse X	Available	Not available
Reverse Y	Available	Not available
Decimation X	Available	Not available
Decimation Y	Available	Not available

Absolute quantum efficiency plots

Important notice before reading the specifications tables

All measurements were done without protection glass or IR cut filter. With protection glass or filters, quantum efficiency (QE) decreases by approximately 10%.

The uncertainty in measurement of the QE values is ±10%.

This is due to:

- Manufacturing tolerance of the sensor
- Uncertainties in the measuring apparatus itself (Ulbricht sphere, optometer, etc.)

Monochrome Sony CCD/CMOS sensors

The curve in the absolute QE plots shown in this chapter were calculated from a single measured quantum efficiency for monochrome sensors. The shape of the curve is from the sensor data sheet but the values have been adjusted based on this measured value.

Color Sony CCD/CMOS sensors

The curves in the absolute QE plots shown in this chapter were calculated from three measured quantum efficiency values for color sensors. The shape of the curves are from the sensor data sheet but the values have been adjusted based on these measured values.

OnSemi CCD sensors

The curve in the absolute QE plots shown in this chapter is from the sensor manufacturer data sheet.

The information was correct at the time of publishing.

Wavelength

The wavelength range in the absolute QE plots reflects the information available in the sensor manufacturer data sheet at the time of publishing. Many color sensors are documented by the sensor manufacturer only for wavelengths from 400 nm to 700 nm.

For additional wavelength information, please contact the sensor manufacturer.

Prosilica GT1290/GT1290C

Feature	Specification
Resolution	1280 (H) x 960 (V) 1.2 MP
Sensor	GT1290: Sony ICX445ALA with EXview HAD CCD™ technology GT1290C: Sony ICX445AQA with EXview HAD CCD™ technology
Sensor type	Interline CCD, Progressive Scan
Sensor size	Type 1/3 6.0 mm diagonal
Cell size	3.75 µm x 3.75 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Standard format
Maximum frame rate at full resolution	33.3 fps
Maximum image bit depth	14-bit (mono); 12-bit (color)
Image buffer	128 MB
StreamHoldCapacity	53 frames at full resolution
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed
RAW formats	BayerRG8, BayerRG12, BayerRG12Packed
Exposure control	12 µs to 77.3 s; 1 µs increments
Gain control	0 to 29 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 14 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Single-tap
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	2.9 W @ 12 VDC 3.5 W PoE
Trigger latency	2 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +65 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)

Table 2: *Prosilica GT1290/GT1290C camera specifications*

Feature	Specification
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	86 x 53.3 x 33 mm
Mass	211 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

Table 2: *Prosilica GT1290/GT1290C camera specifications (continued)*

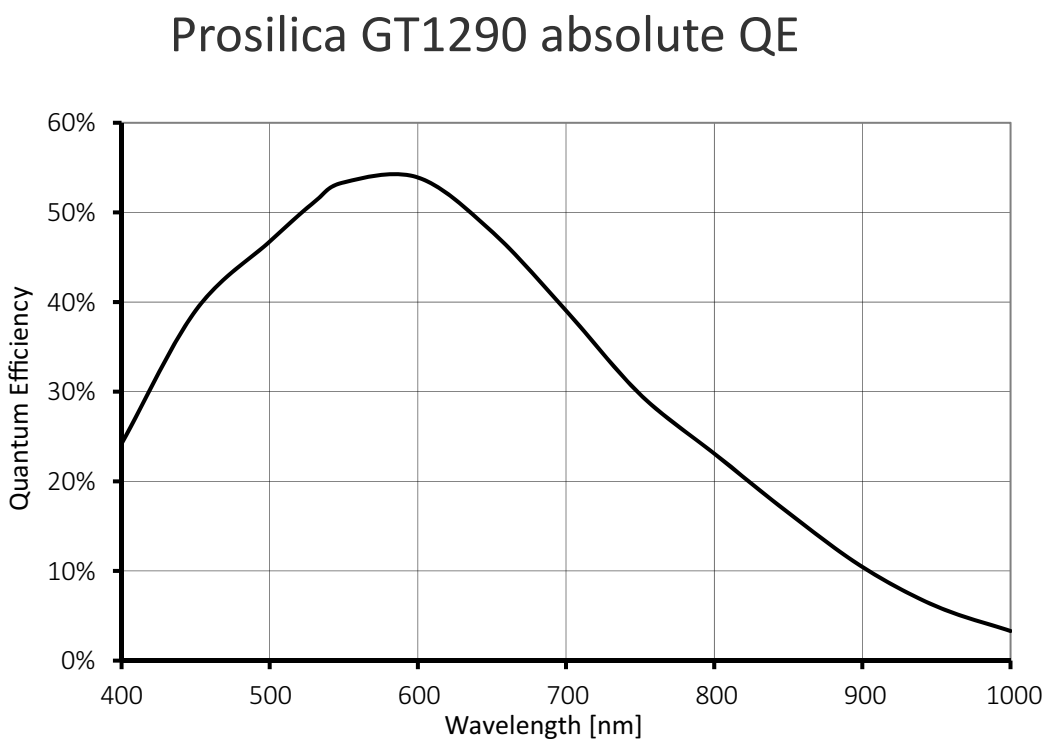


Figure 1: *Prosilica GT1290 (Sony ICX445) absolute QE plot*

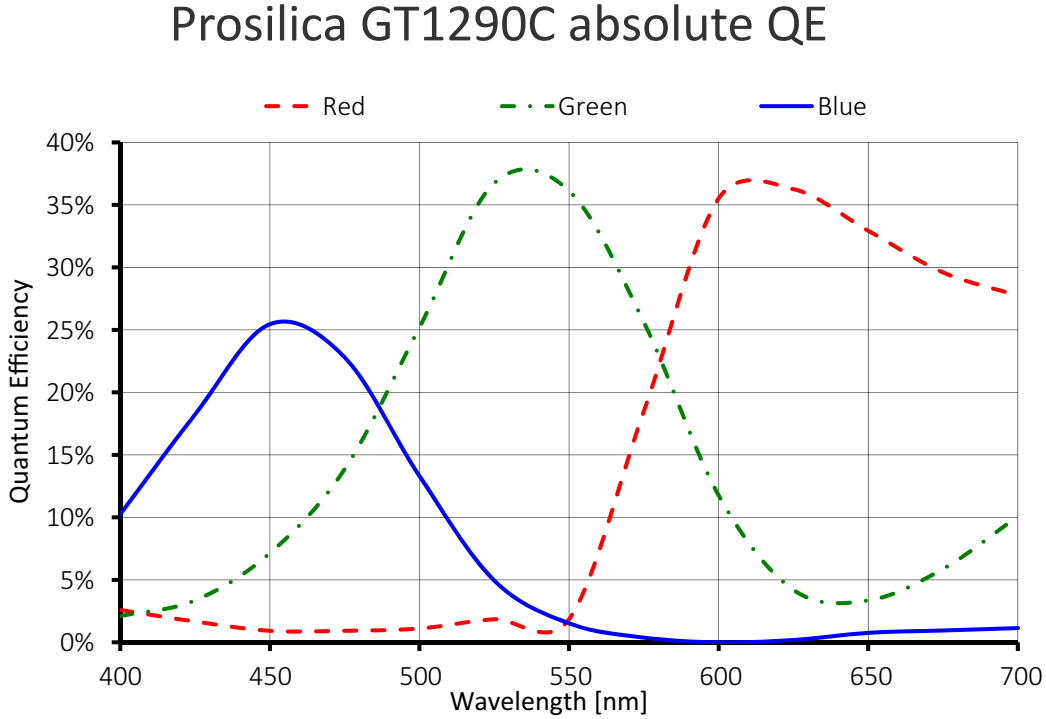


Figure 2: *Prosilica GT1290C (Sony ICX445) absolute QE plot (without IR cut filter)*

ROI frame rate

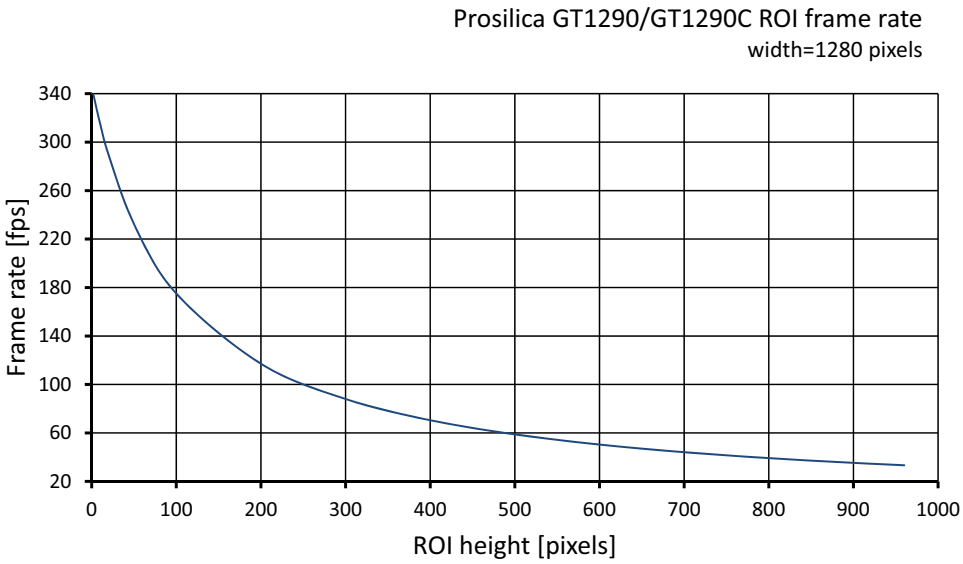


Figure 3: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
960	33.3
900	35.3
800	39.2
700	44.1
600	50.4
500	58.8
400	70.5

Height [pixels]	Frame rate [fps]
300	88
200	117.1
100	175
50	232.4
20	289.5
10	315.2
2	339.4

Table 3: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	480	60.8
3	320	83.8
4	240	103.3
5	192	120
6	160	134.5
7	136	147.8

Table 4: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
8	120	158.3
9	106	168.7
10	96	176.9
11	86	185.1
12	80	191.9

Table 4: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT1380/GT1380C

Feature	Specification
Resolution	1360 (H) x 1024 (V) 1.4 MP
Sensor	GT1380: Sony ICX285AL with EXview HAD CCD™ technology GT1380C: Sony ICX285AQ with EXview HAD CCD™ technology
Sensor type	Interline CCD, Progressive Scan
Sensor size	Type 2/3 11.0 mm diagonal
Cell size	6.45 µm x 6.45 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Standard format
Maximum frame rate at full resolution	30.5 fps
Maximum image bit depth	14-bit (mono); 12-bit (color)
Image buffer	128 MB
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed
RAW formats	BayerRG8, BayerRG12, BayerRG12Packed
Exposure control	10 µs to 77.3 s; 1 µs increments
Gain control	0 to 34 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 14 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Single-tap
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	3.4 W @ 12 VDC 4.2 W PoE
Trigger latency	2.2 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +65 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)
Operating humidity	20 to 80% non-condensing

Table 5: *Prosilica GT1380/GT1380C camera specifications*

Feature	Specification
Body dimensions (L x W x H)	86 x 53.3 x 33 mm
Mass	211 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

Table 5: *Prosilica GT1380/GT1380C camera specifications (continued)*

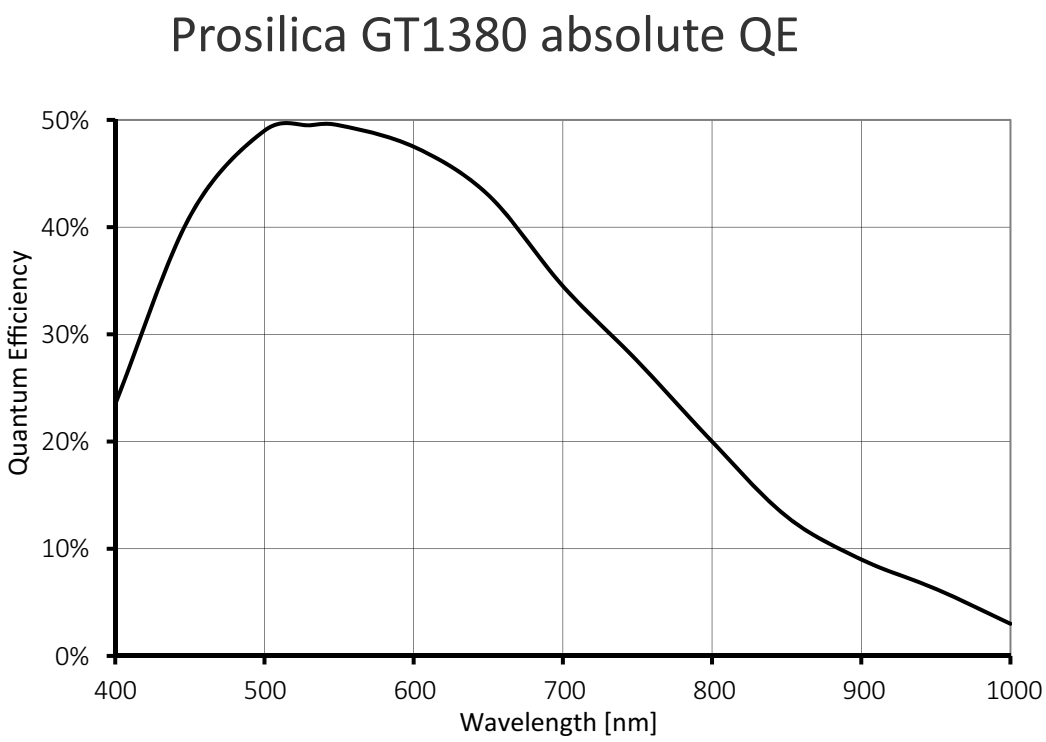


Figure 4: *Prosilica GT1380 (Sony ICX285) absolute QE plot*

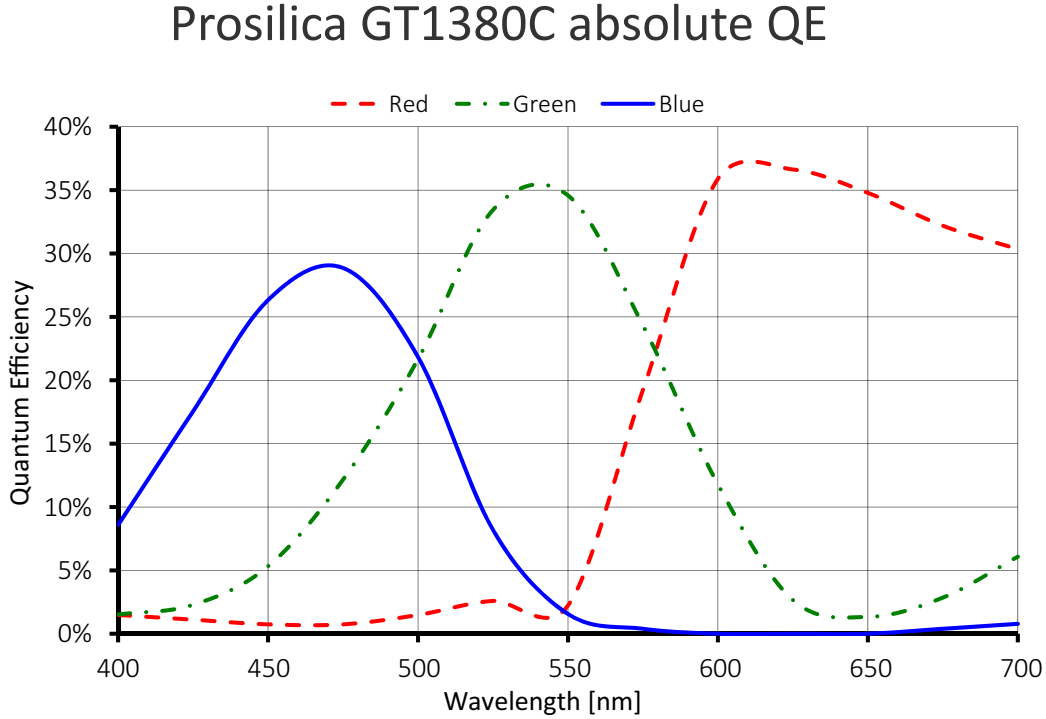


Figure 5: *Prosilica GT1380C (Sony ICX285) absolute QE plot (without IR cut filter)*

ROI frame rate

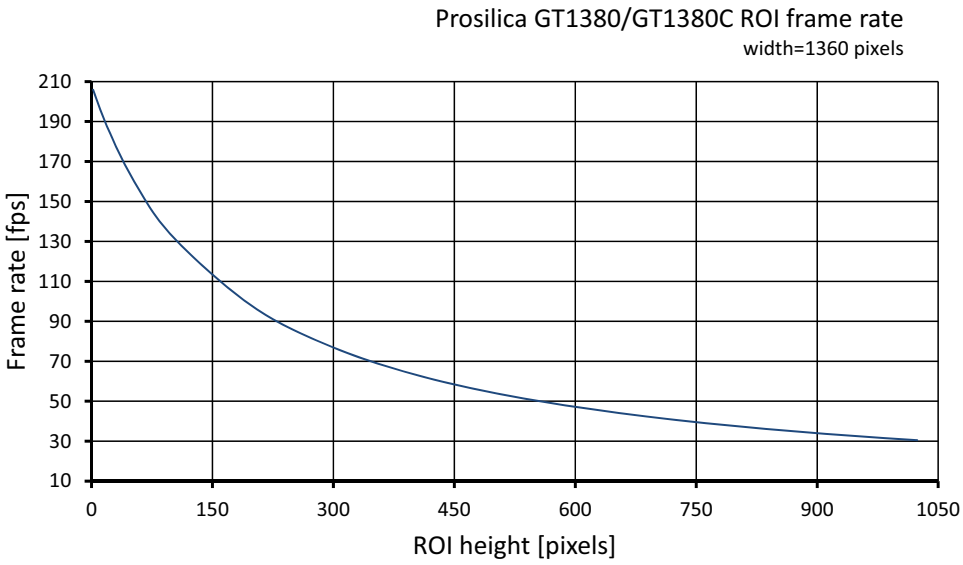


Figure 6: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
1024	30.5
1000	31.1
900	34
800	37.5
700	41.8
600	47.2
500	54.1
400	63.5
300	76.9
200	97.4
100	132.7
50	162.1
20	186.9
10	197
2	205.9

Table 6: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	512	53.2
3	341	70.7
4	256	84.6
5	204	96.0
6	170	105.4

Table 7: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
7	146	113.1
8	128	119.6
9	113	125.6
10	102	130.4
11	93	134.6
12	85	138.5
13	78	142.1
14	73	144.7

Table 7: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT1600/GT1600C

Feature	Specification
Resolution	1620 (H) x 1220 (V) 2 MP
Sensor	GT1600: Sony ICX274AL with Super HAD CCD technology GT1600C: Sony ICX274AQ with Super HAD Wfine CCD™ technology
Sensor type	Interline CCD, Progressive Scan
Sensor size	Type 1/1.8 8.923 mm diagonal
Cell size	4.4 µm x 4.4 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Standard format
Maximum frame rate at full resolution	25.8 fps
Maximum image bit depth	14-bit (mono); 12-bit (color)
Image buffer	128 MB
StreamHoldCapacity	33 frames at full resolution
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed
RAW formats	BayerRG8, BayerRG12, BayerRG12Packed
Exposure control	10 µs to 68.7 s; 1 µs increments
Gain control	0 to 26 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 14 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Single-tap
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	3.3 W @ 12 VDC 4.0 W PoE
Trigger latency	1.4 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +65 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)

Table 8: *Prosilica GT1600/GT1600C camera specifications*

Feature	Specification
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	86 x 53.3 x 33 mm
Mass	211 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

Table 8: *Prosilica GT1600/GT1600C camera specifications (continued)*

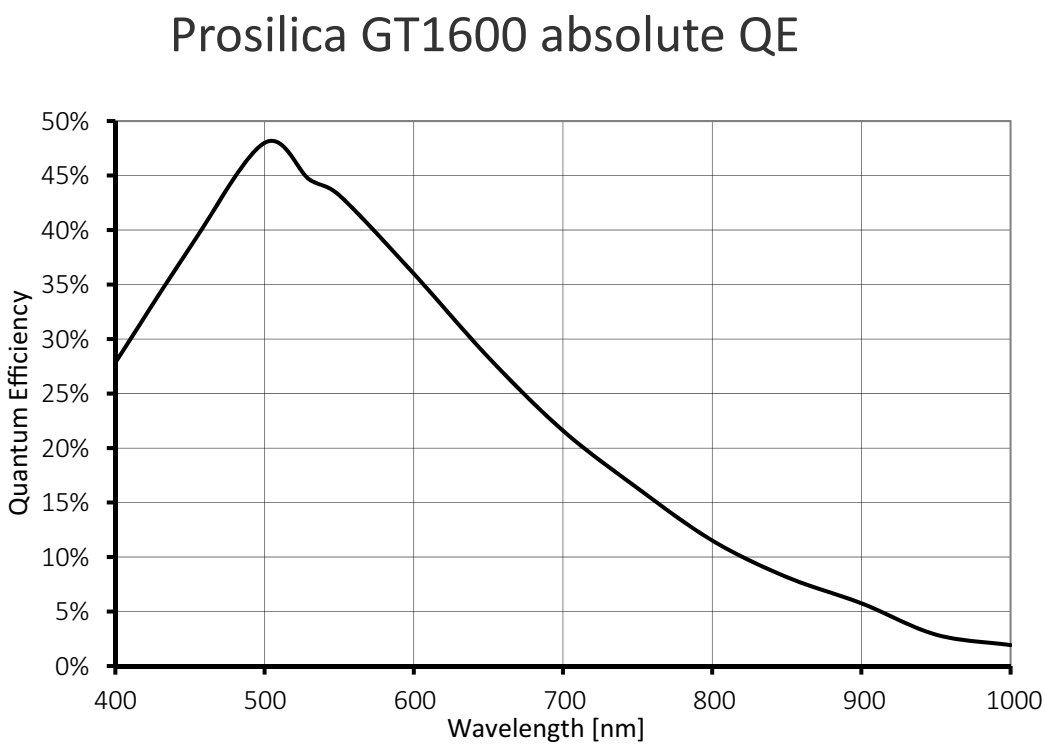


Figure 7: *Prosilica GT1600 (Sony ICX274) absolute QE plot*

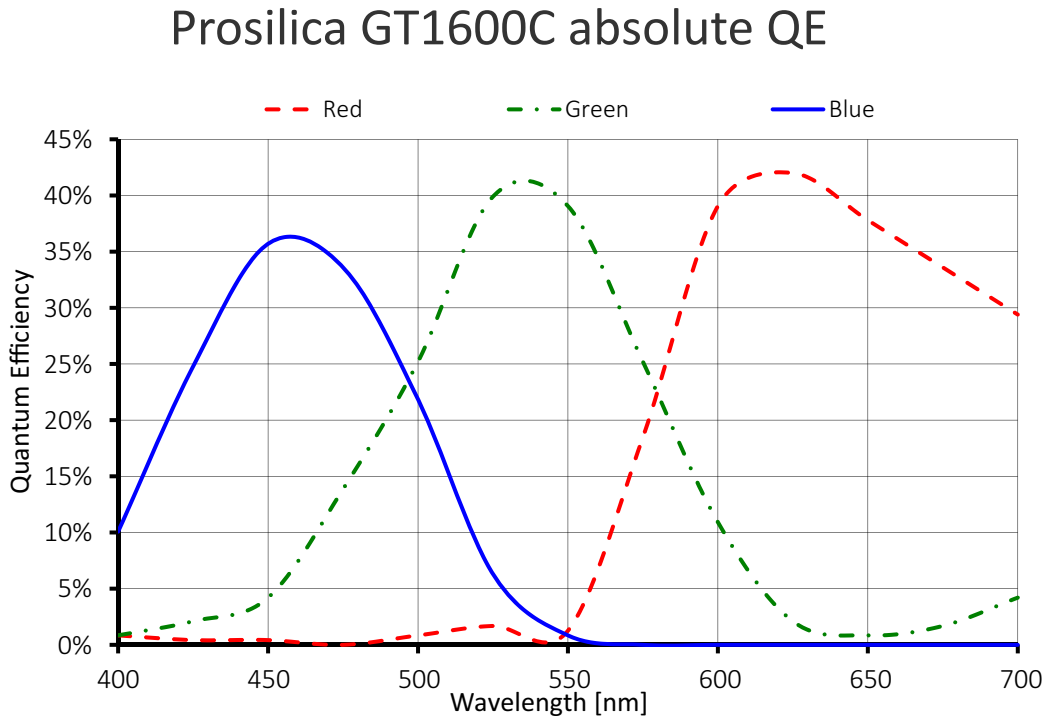


Figure 8: *Prosilica GT1600C (Sony ICX274) absolute QE plot (without IR cut filter)*

ROI frame rate

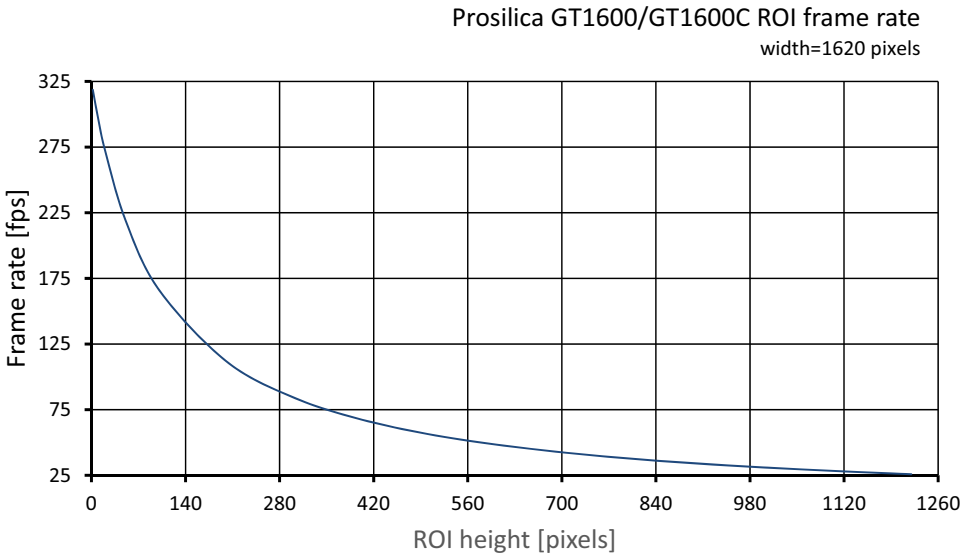


Figure 9: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
1220	25.8
1100	28.4
1000	31
900	34
800	37.8
700	42.5
600	48.5
500	56.5

Height [pixels]	Frame rate [fps]
400	67.7
300	84.4
200	112.1
100	116.6
50	220.2
20	272.9
10	296.5
2	318.6

Table 9: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	610	47.9
3	406	66.9
4	304	83.5
5	244	97.8
6	202	111.0

Table 10: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
7	174	122.1
8	152	132.4
9	134	142.2
10	122	149.6
11	110	157.7
12	100	165.2
13	92	171.7
14	86	176.9

Table 10: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT1660/GT1660C

Feature	Specification
Resolution	1600 (H) x 1200 (V) 1.9 MP
Sensor	ON Semiconductor KAI-02050 TRUESENSE
Sensor type	Interline CCD, Progressive Scan
Sensor size	Type 2/3 11.0 mm diagonal
Cell size	5.5 µm x 5.5 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Extended format
Maximum frame rate at full resolution	Four-tap mode: 62.1 fps One-tap mode: 17.9 fps
Maximum image bit depth	14-bit (mono); 12-bit (color)
Image buffer	128 MB
StreamHoldCapacity	68 frames at full resolution
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGR8, BayerGR12, BayerRG12Packed
Exposure control	10 µs to 26.8 s; 1 µs increments
Gain control	0 to 32 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Four-tap Single-tap switchable in Vimba Viewer 2.0 or later
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	5.1 W @ 12 VDC 6.3 W PoE
Trigger latency	2.1 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +60 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)

Table 11: *Prosilica GT1660/GT1660C camera specifications*

Feature	Specification
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	92 x 53.3 x 33 mm
Mass	224 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

Table 11: *Prosilica GT1660/GT1660C camera specifications (continued)*

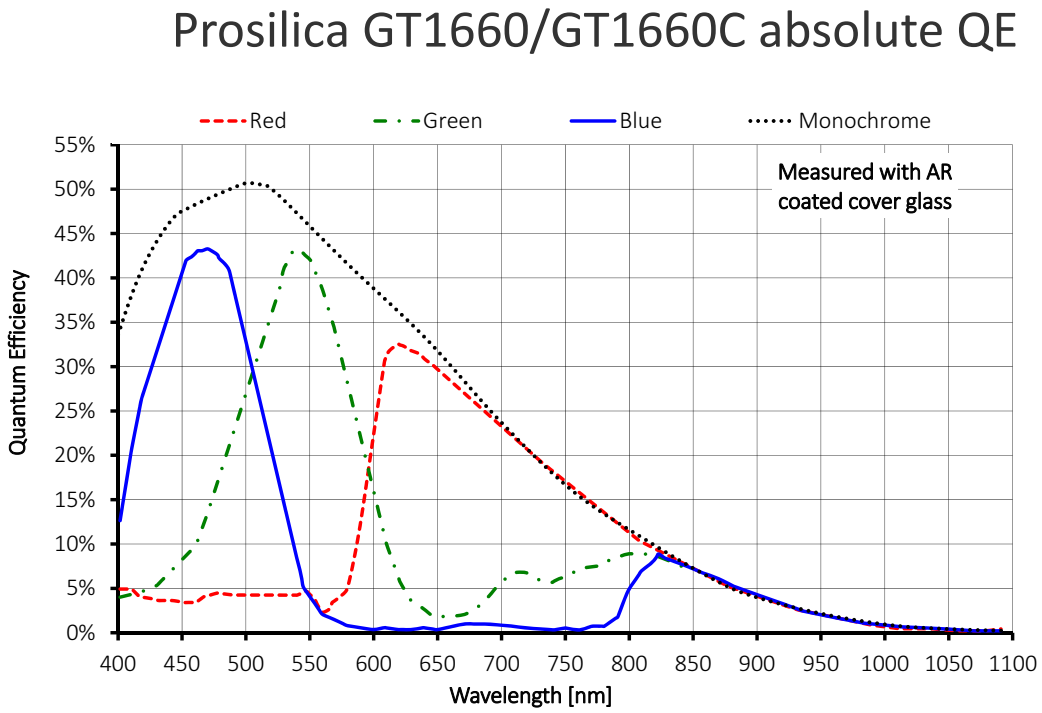


Figure 10: *Prosilica GT1660/GT1660C (OnSemi KAI-02050) absolute QE plot*

ROI frame rate

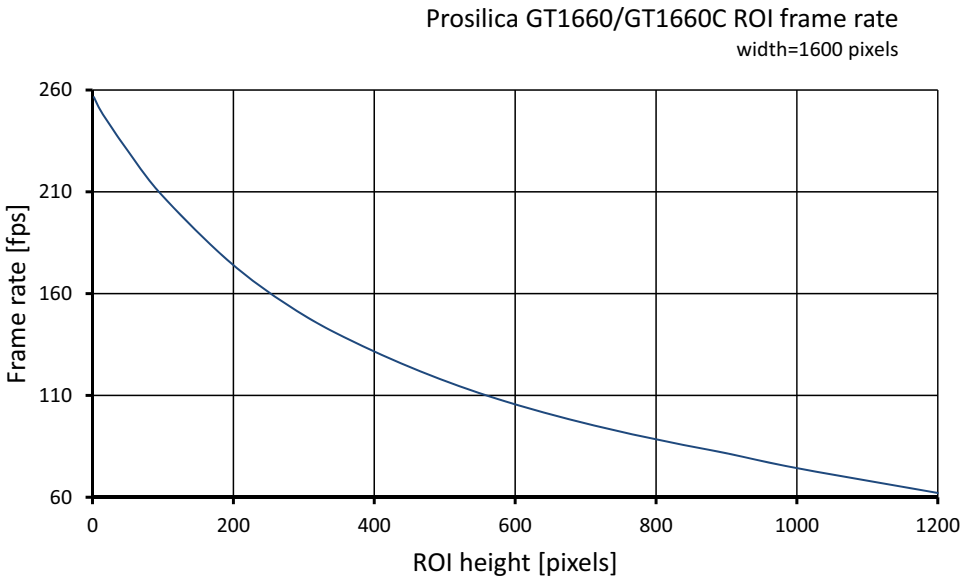


Figure 11: *Frame rate as function of ROI height plot*

Height [pixels]	Frame rate [fps]
1200	62.1
1000	74.3
900	81.6
800	88.4
700	96.3
600	105.6
500	117.2
400	131.6
300	149.4
200	174
100	207.8
50	230.2
20	245.3
10	250.8
2	256.5

Table 12: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	600	121
3	400	165.4
4	300	202.8
5	240	234.2
6	200	260.8

Table 13: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
7	170	284.0
8	150	303.1

Table 13: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT1910/GT1910C

Feature	Specification
Resolution	1920 (H) x 1080 (V) 2.1 MP
Sensor	ON Semiconductor KAI-02150 TRUESENSE
Sensor type	Interline CCD, Progressive Scan
Sensor size	Type 2/3 12.1 mm diagonal
Cell size	5.5 µm x 5.5 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Extended format
Maximum frame rate at full resolution	Four-tap mode: 57.5 fps One-tap mode: 16.9 fps
Maximum image bit depth	14-bit (mono); 12-bit (color)
Image buffer	128 MB
StreamHoldCapacity	63 frames at full resolution
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGR8, BayerGR12, BayerRG12Packed
Exposure control	10 µs to 26.8 s; 1 µs increments
Gain control	0 to 32 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Four-tap Single-tap switchable in Vimba Viewer 2.0 or later
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	5.1 W @ 12 VDC 6.3 W PoE
Trigger latency	2.2 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +60 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)

Table 14: *Prosilica GT1910/GT1910C camera specifications*

Feature	Specification
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	92 x 53.3 x 33 mm
Mass	224 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

Table 14: *Prosilica GT1910/GT1910C camera specifications (continued)*

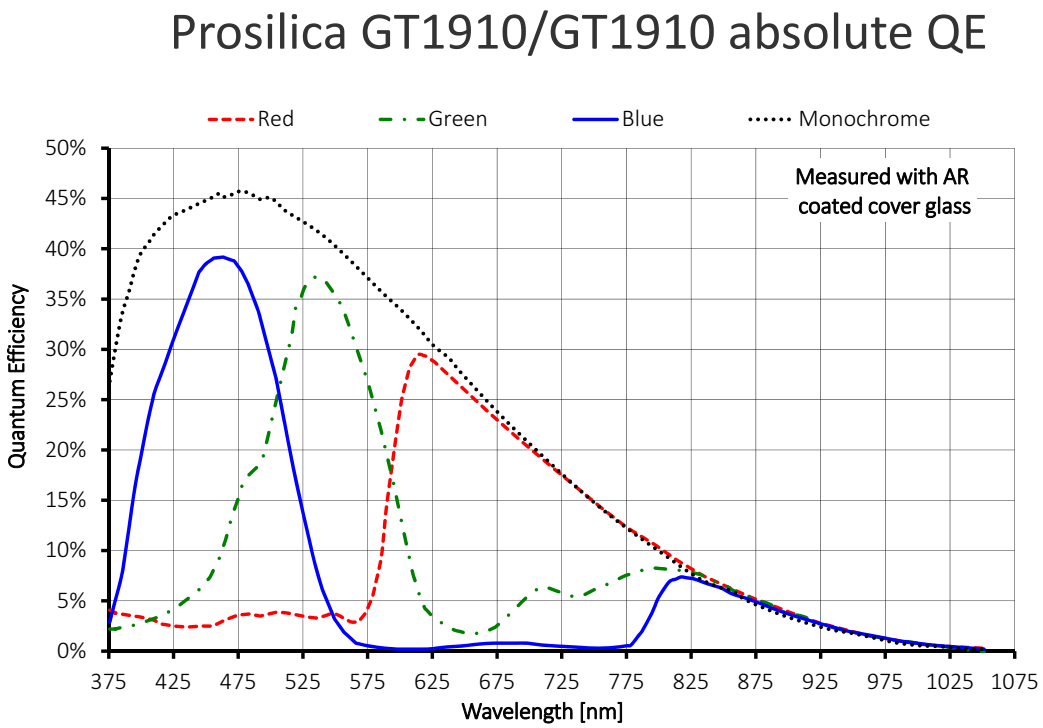


Figure 12: *Prosilica GT1910/GT1910C (OnSemi KAI-02150) absolute QE plot*

ROI frame rate

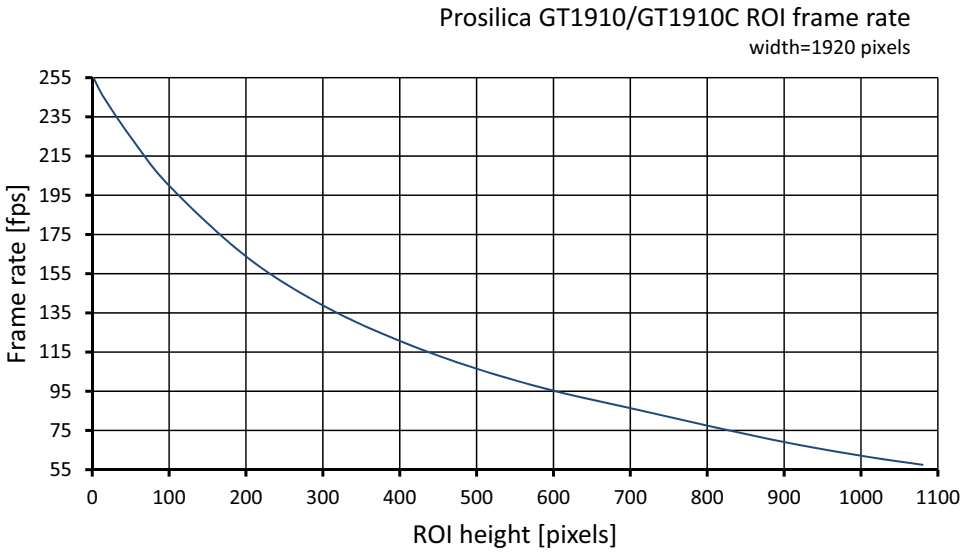


Figure 13: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
1080	57.5
1000	62.1
900	69.1
800	77.5
700	86.4
600	95.3
500	106.5
400	120.7
300	138.8
200	163.8
100	199.9
50	224.7
20	241.9
10	248.3
2	254.8

Table 15: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	540	114.1
3	360	160.8
4	270	198.7
5	216	230.8
6	180	258.5

Table 16: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
7	154	282.6
8	134	304.0

Table 16: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT1920/GT1920C

Feature	Specification
Resolution	1936 (H) x 1456 (V) 2.8 MP
Sensor	GT1920: Sony ICX674ALG with EXview HAD II™ microlens technology GT1920C: Sony ICX674AQG with EXview HAD II™ microlens technology
Sensor type	Interline CCD, Progressive Scan
Sensor size	Type 2/3 10.972 mm diagonal
Cell size	4.54 µm x 4.54 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Extended format
Maximum frame rate at full resolution	Four-tap mode: 40.7 fps One-tap mode: 11.6 fps
Maximum image bit depth	14-bit (mono); 12-bit (color)
Image buffer	128 MB
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGR8, BayerGR12, BayerRG12Packed
Exposure control	10 µs to 26.8 s; 1 µs increments
Gain control	0 to 33 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Four-tap Single-tap switchable in Vimba Viewer 2.0 or later
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	4.9 W @ 12 VDC 6.0 W PoE
Trigger latency	2 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +60 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)

Table 17: *Prosilica GT1920/GT1920C camera specifications*

Feature	Specification
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	92 x 53.3 x 33 mm
Mass	224 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

Table 17: *Prosilica GT1920/GT1920C camera specifications (continued)*

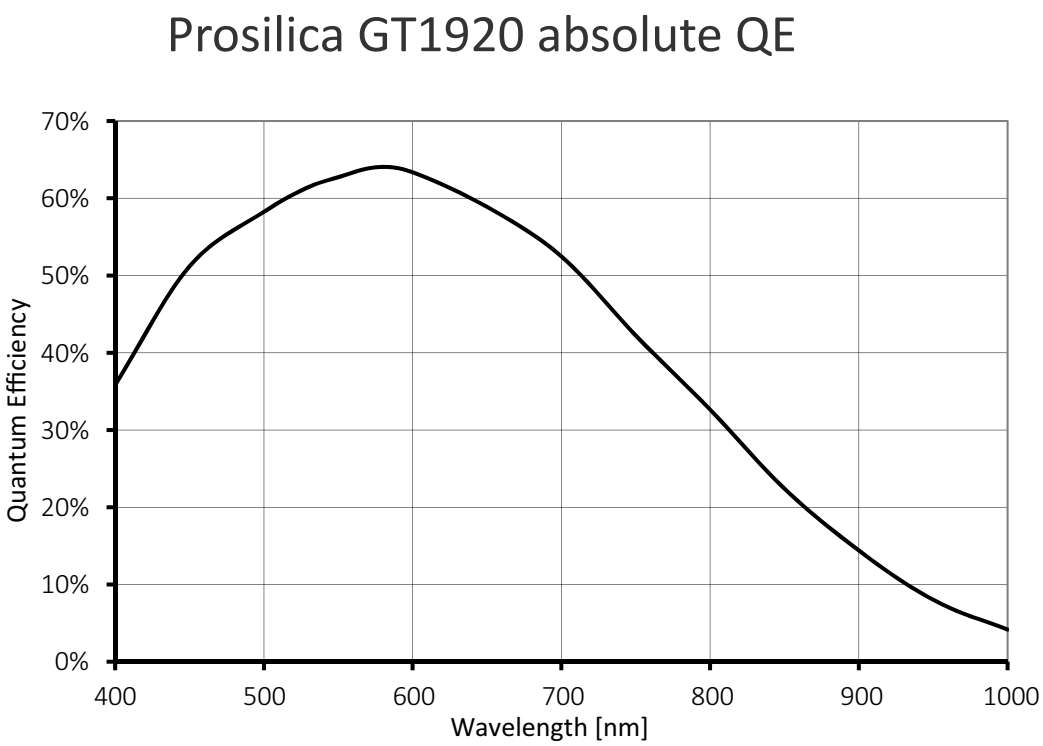


Figure 14: *Prosilica GT1920 (Sony ICX674) absolute QE plot*

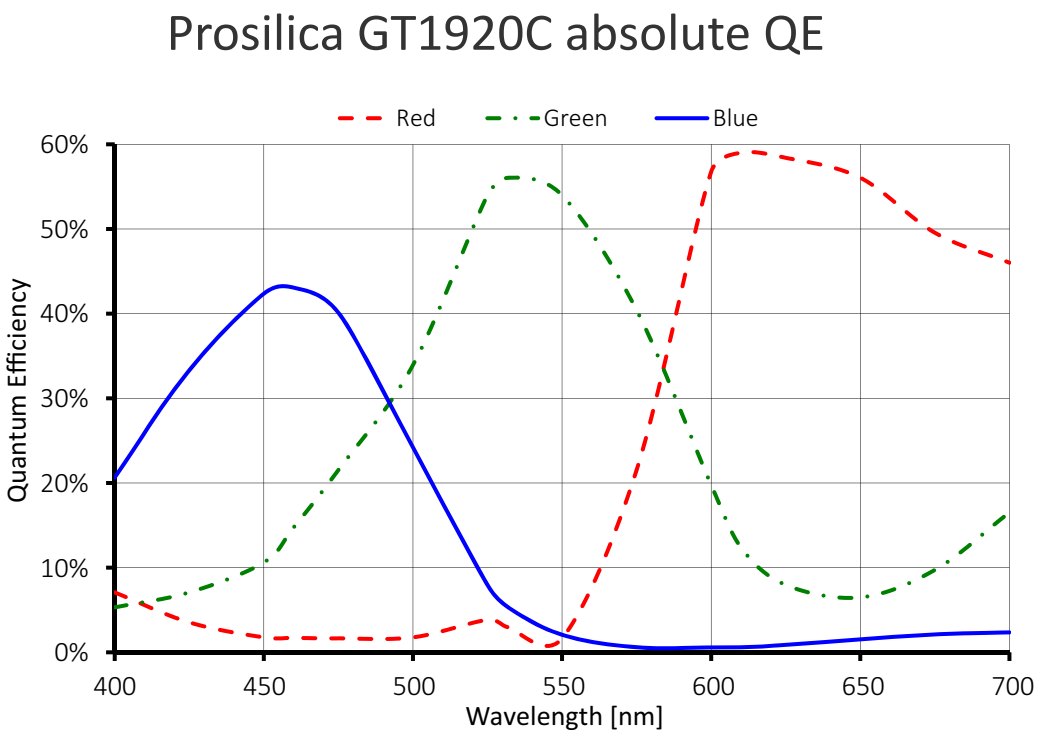


Figure 15: *Prosilica GT1920C (Sony ICX674) absolute QE plot (without IR cut filter)*

ROI frame rate

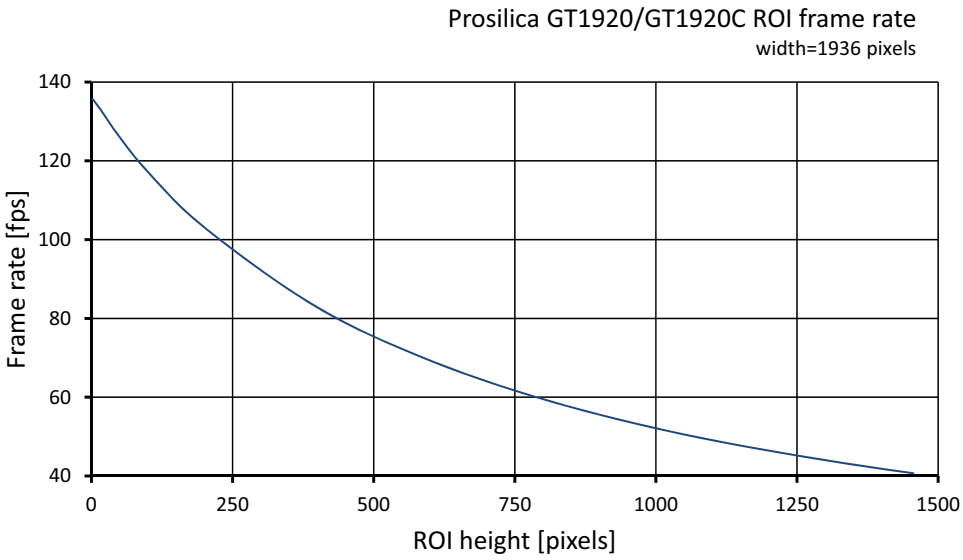


Figure 16: *Frame rate as function of ROI height plot*

Height [pixels]	Frame rate [fps]
1456	40.7
1400	41.8
1200	46.4
1000	52.1
800	59.5
600	69.3
400	82.8
200	103.1
100	117.2
50	126
20	132.2
10	134.2
2	135.7

Table 18: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	728	70.3
3	484	92.8
4	364	110.0
5	290	124.1
6	242	135.1
7	208	144.1
8	182	151.7

Table 19: *Frame rate as a function of ROI height with vertical binning enabled*

Prosilica GT1930/GT1930C

Feature	Specification		
Resolution	1936 (H) x 1216 (V) 2.4 MP		
Sensor	GT1930: Sony IMX174LLJ Exmor with Pregius® global shutter GT1930C: Sony IMX174LQJ Exmor with Pregius® global shutter		
Sensor type	CMOS, Progressive Scan		
Sensor size	Type 1/1.2 13.4 mm diagonal		
Cell size	5.86 µm x 5.86 µm		
Lens mount	Standard: C-Mount Optional: See the Modular Concept		
Housing[1]	Standard format		
Maximum frame rate at full resolution	50.7 fps (55.8 fps burst mode[2])		
Maximum image bit depth	12-bit		
Image buffer	128 MB		
Monochrome formats	Mono8, Mono12, Mono12Packed		
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed		
Color formats (RGB)	RGB8Packed, BGR8Packed		
RAW formats	BayerRG8, BayerRG12		
Exposure control	GT1930	42 µs to 88 s	
	GT1930C	28 µs to 88 s, 14 µs increments	Mono8, BayerRG8, BayerRG12, YUV411Packed, YUV422Packed
		56 µs to 88 s, 28 µs increments	RGB8Packed, BGR8Packed, YUV444Packed
Gain control	0.0 to 40.0 dB, 0.1 dB increments		
Binning	Horizontal: 1 to 4 pixels Vertical: 1 to 4 rows		
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor		
Sensor taps	Four-tap		
TTL (non-isolated) I/Os	1 input, 2 outputs		
Opto-isolated I/Os	1 input, 2 outputs		
RS232	1 TxD, 1 RxD		
Voltage requirements	7 to 25 VDC; PoE		
Power consumption	3.4 W @ 12 VDC 4.2 W PoE		
Trigger latency[3]	50.1 µs		
Trigger jitter[3]	7.2 µs		

Table 20: *Prosilica GT1930/GT1930C camera specifications*

Feature	Specification
Propagation delay (t_{pd})	30 ns for non-isolated I/O, 70 ns for isolated I/O
Operating temperature[4]	-20 °C to +65 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	86 x 53 x 33 mm
Mass	211 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board only. Resolution: 0.031; Accuracy: ±1 °C

[1] The Prosilica GT1930/GT1930C housing lens protrusion is 2.3 mm shorter than a regular standard housing. See Prosilica GT1930 for the dimensions.

[2] These values are calculated directly from the microcontroller source. These values are only valid for pixel formats ≤16 bit per pixel.

[3] GigE host controller card with jumbo packets is required. See Hardware Selection for Allied Vision GigE Cameras application note for a list of recommended GigE host controller cards.

[4] Selects the site which temperature is reported. For more information on `DeviceStatus`, see the GigE Features Reference.

Table 20: *Prosilica GT1930/GT1930C camera specifications (continued)*

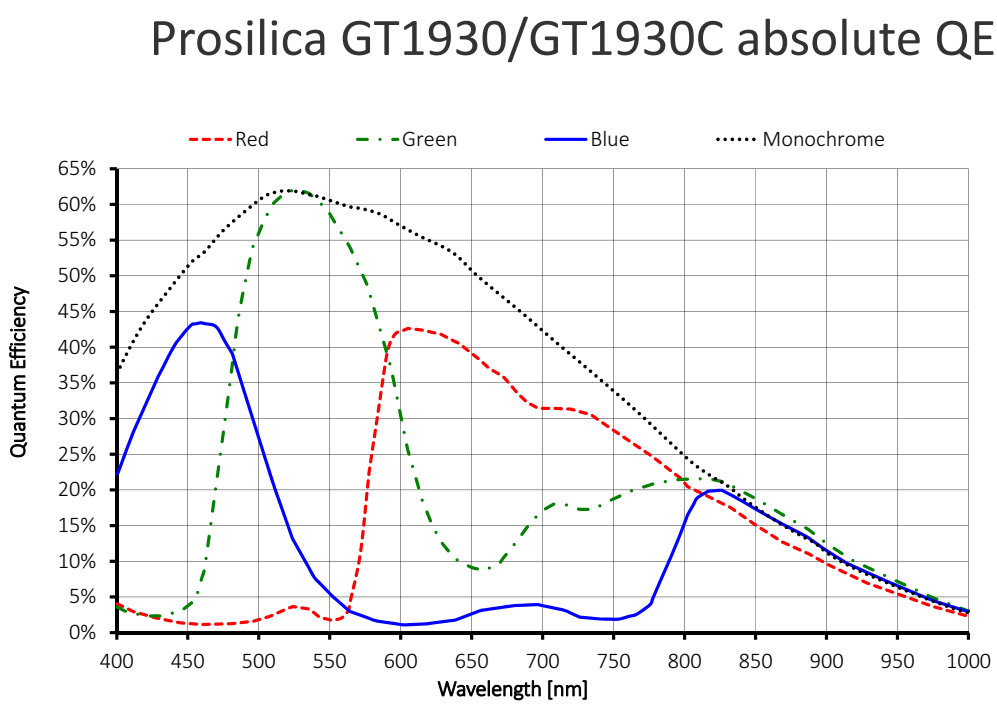


Figure 17: *Prosilica GT1930/GT1930C (Sony IMX174) absolute QE plot (without IR cut filter)*

ROI frame rate

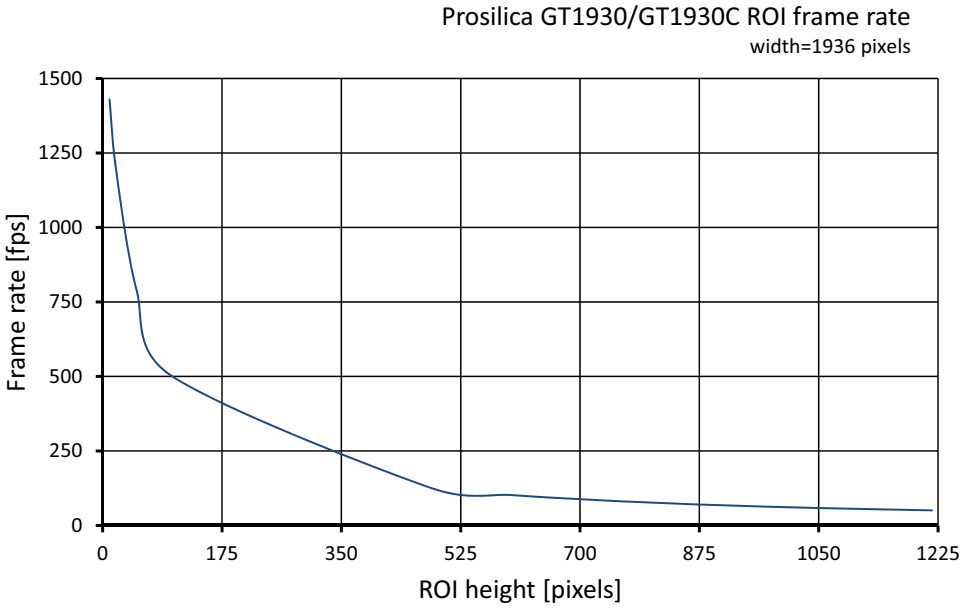


Figure 18: *Frame rate as a function of ROI height plot*

There will be an increase in frame rate with reduced width if the camera is bandwidth limited.

Height [pixels]	Frame rate [fps]
1216	50.7
1200	51.4
1080	57
1024	60
960	64
768	80.1

Height [pixels]	Frame rate [fps]
600	102
480	126.9
100	503.6
50	787
20	1187.2
10	1429.4

Table 21: *Frame rate as a function of ROI height values*

Prosilica GT1930L/GT1930LC

Feature	Specification		
Resolution	1936 (H) x 1216 (V) 2.4 MP		
Sensor	GT1930L: Sony IMX174LLJ Exmor with Pregius® global shutter GT1930LC: Sony IMX174LQJ Exmor with Pregius® global shutter		
Sensor type	CMOS, Progressive Scan		
Sensor size	Type 1/1.2 13.4 mm diagonal		
Cell size	5.86 µm x 5.86 µm		
Lens mount[1]	Standard: EF-Mount Optional: See the Modular Concept		
Housing	Large format		
Maximum frame rate at full resolution	50.7 fps (55.8 fps burst mode[2])		
Maximum image bit depth	12-bit		
Image buffer	128 MB		
Monochrome formats	Mono8, Mono12, Mono12Packed		
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed		
Color formats (RGB)	RGB8Packed, BGR8Packed		
RAW formats	BayerRG8, BayerRG12		
Exposure control	GT1930L	42 µs to 88 s	
	GT1930LC	28 µs to 88 s, 14 µs increments	Mono8, BayerRG8, BayerRG12, YUV411Packed, YUV422Packed
		56 µs to 88 s, 28 µs increments	RGB8Packed, BGR8Packed, YUV444Packed
Gain control	0.0 to 40.0 dB, 0.1 dB increments		
Binning	Horizontal: 1 to 4 pixels Vertical: 1 to 4 rows		
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor		
Sensor taps	Four-tap		
TTL (non-isolated) I/Os	1 input, 2 outputs		
Opto-isolated I/Os	1 input, 2 outputs		
RS232	1 TxD, 1 RxD		
Voltage requirements	7 to 25 VDC; PoE		
Power consumption	3.24 W @ 12 VDC 3.88 W PoE		
Trigger latency[3]	50.1 µs		
Trigger jitter[3]	7.2 µs		

Table 22: *Prosilica GT1930L/GT1930LC camera specifications*

Feature	Specification
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-30 °C to +70 °C housing temperature (without condensation)
Storage temperature	-40 °C to +80 °C ambient temperature (without condensation)
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	96 x 66 x 53.3 mm
Mass	372 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board only. Resolution: 0.031; Accuracy: ±1 °C

[1] To enable EF lens control on Prosilica GT cameras you must update firmware to version 01.54.14263 or later.

[2] GigE host controller card with jumbo packets is required. See the Hardware Selection for Allied Vision GigE Cameras application note for a list of recommended GigE host controller cards.

[3] These values are calculated directly from the microcontroller source. These values are only valid for pixel formats ≤16 bit per pixel.

Table 22: *Prosilica GT1930L/GT1930LC camera specifications (continued)*

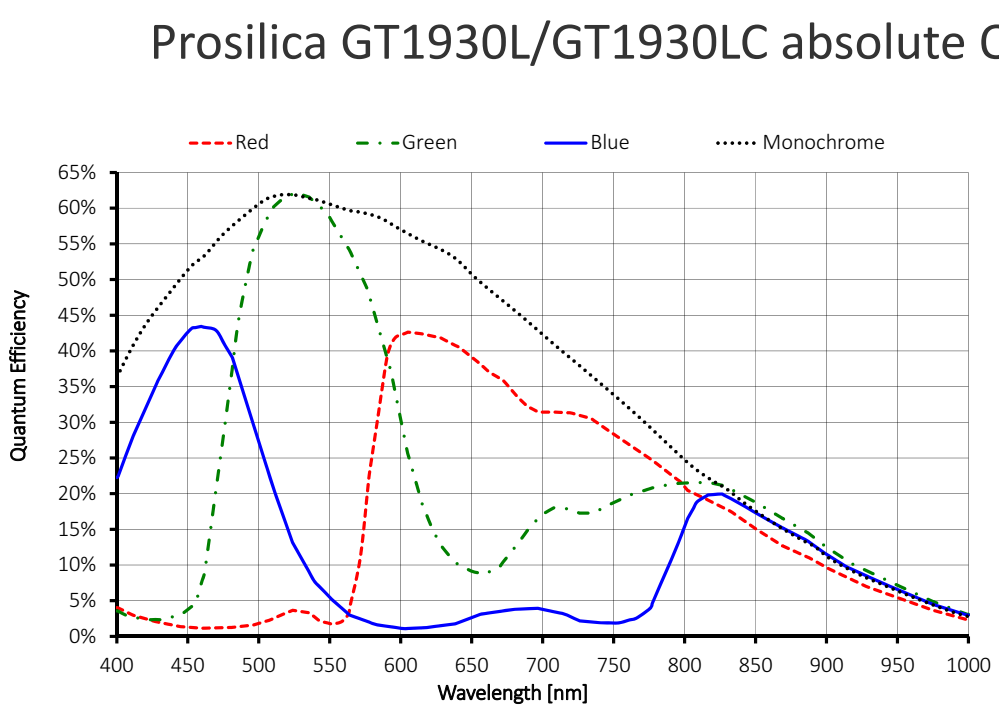


Figure 19: *Prosilica GT1930L/GT1930LC (Sony IMX174) absolute QE plot (without IR cut filter)*

ROI frame rate

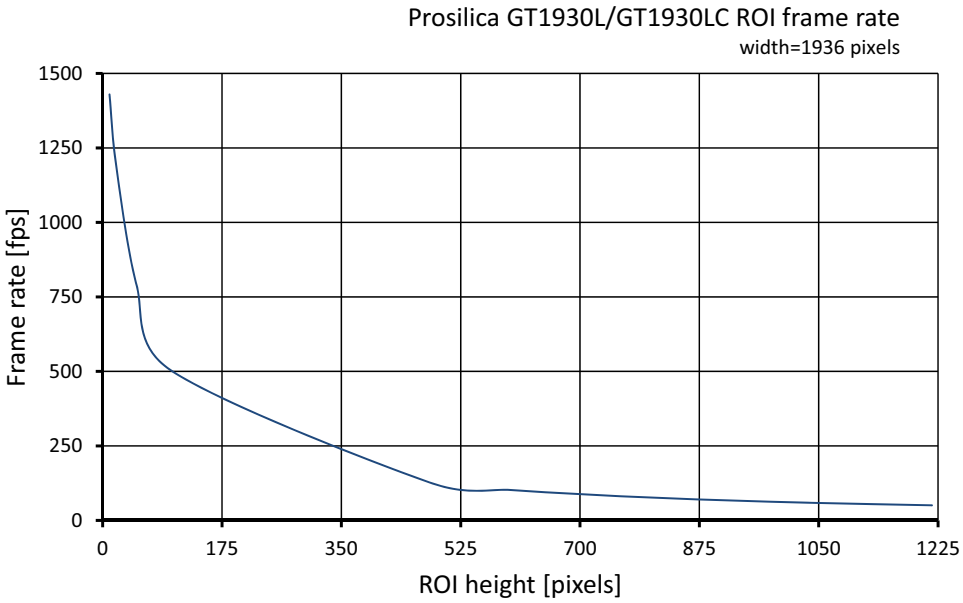


Figure 20: *Frame rate as a function of ROI height plot*

There will be an increase in frame rate with reduced width if the camera is bandwidth limited.

Height [pixels]	Frame rate [fps]
1216	50.7
1200	51.4
1080	57
1024	60
960	64
768	80.1

Height [pixels]	Frame rate [fps]
600	102
480	126.9
100	503.6
50	787
20	1187.2
10	1429.4

Table 23: *Frame rate as a function of ROI height values*

Prosilica GT2000/GT2000NIR/GT2000C

Feature	Specification
Resolution	2048 (H) x 1088 (V) 2.2 MP
Sensor	CMOSIS CMV2000 with microlenses and global shutter
Sensor type	CMOS
Sensor size	Type 2/3 12.7 mm diagonal
Cell size	5.5 µm x 5.5 µm
Lens mount[1]	Standard: C-Mount Optional: See the Modular Concept
Housing	Standard format
Maximum frame rate at full resolution	53.7 fps (60.1 fps burst mode[2])
Maximum image bit depth	12-bit
Image buffer	128 MB
StreamHoldCapacity	29 frames at full resolution
Monochrome formats	Mono8, Mono12, Mono12Packed
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGB8, BayerGB12, BayerGB12Packed
Exposure control[3]	18 µs to 126.2 s; 1 µs increments
Gain control	0 to 26 dB
Binning	N/A
Decimation X/Y	N/A
Sensor taps	Four-tap
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	3.4 W @ 12 VDC 4.2 W PoE
Trigger latency	700 ns
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +65 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)
Operating humidity	20 to 80% non-condensing

Table 24: *Prosilica GT2000/GT2000NIR/GT2000C camera specifications*

Feature	Specification
Body dimensions (L x W x H)	86 x 53.3 x 33 mm
Mass	210 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board only. Resolution: 0.031; Accuracy: ±1 °C

[1] 1 inch format lens recommended

[2] GigE host controller card with jumbo packets is required. See the Hardware Selection for Allied Vision GigE Cameras application note for a list of recommended GigE host controller cards.

[3] Camera firmware version 01.52.8151 shows minimum exposure values without frame overhead time, i.e., 1 µs. See sensor data sheet for details on frame overhead time.

Table 24: *Prosilica GT2000/GT2000NIR/GT2000C camera specifications (continued)*

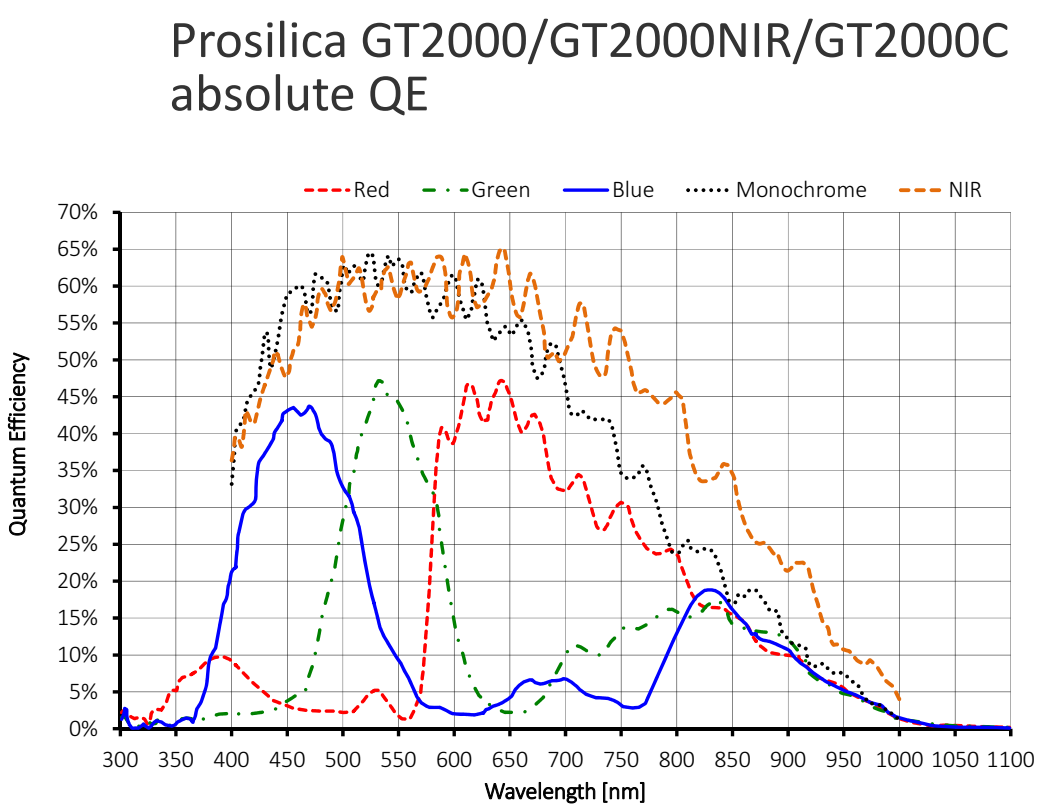


Figure 21: *Prosilica GT2000/GT2000NIR/GT2000C (CMOSIS CMV2000) absolute QE plot (without IR cut filter)*

ROI frame rate

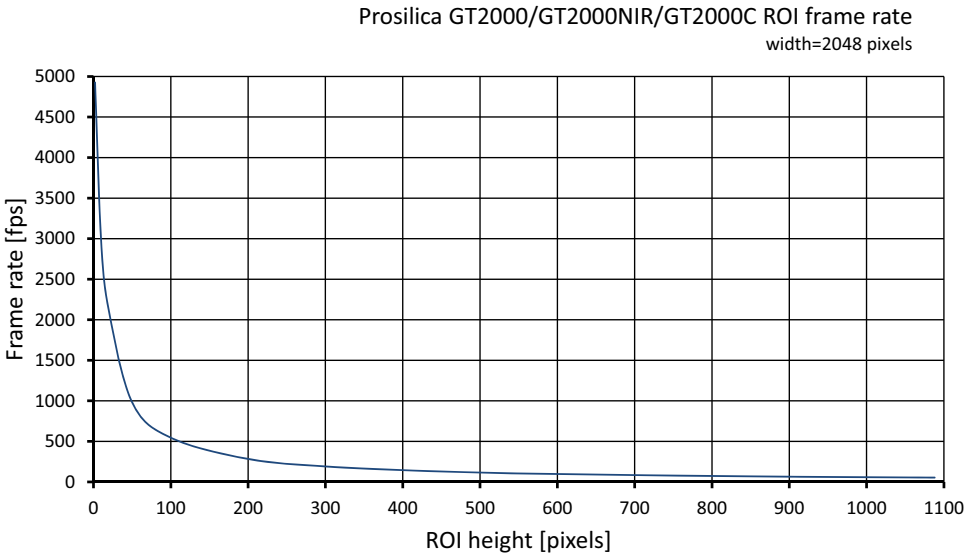


Figure 22: *Frame rate as a function of ROI height plot*

There will be an increase in frame rate with reduced width if the camera is bandwidth limited.

Height [pixels]	Frame rate [fps]
1088	53.7
1000	58.4
900	64.8
800	72.9
700	83.2
600	96.8
500	115.9
400	144.3

Height [pixels]	Frame rate [fps]
300	191.2
200	283.1
100	545.3
50	981.4
20	2105.3
10	2949.9
2	4926.1

Table 25: *Frame rate as a function of ROI height values*

Prosilica GT2050/GT2050NIR/GT2050C

Feature	Specification
Resolution	2048 (H) x 2048 (V) 4.2 MP
Sensor	CMOSIS CMV4000
Sensor type	CMOS
Sensor size	Type 1 16.0 mm diagonal
Cell size	5.5 µm x 5.5 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Standard format
Maximum frame rate at full resolution	28.6 fps (32.0 burst mode[1])
Maximum image bit depth	12-bit
Image buffer	128 MB
StreamHoldCapacity	15 frames at full resolution
Monochrome formats	Mono8, Mono12, Mono12Packed
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGB8, BayerGB12, BayerGB12Packed
Exposure control[3]	34 µs to 126.2 s; 1 µs increments
Gain control	0 to 26 dB
Binning	N/A
Decimation X/Y	N/A
Sensor taps	Four-tap
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	3.5 W @ 12 VDC 4.3 W PoE
Trigger latency	700 ns
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +65 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)
Operating humidity	20 to 80% non-condensing

Table 26: *Prosilica GT2050/GT2050NIR/GT2050C camera specifications*

Feature	Specification
Body dimensions (L x W x H)	86 x 53.3 x 33 mm
Mass	210 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board only. Resolution: 0.031; Accuracy: ±1 °C

[1] GigE host controller card with jumbo packets is required. See the Hardware Selection for Allied Vision GigE Cameras application note for a list of recommended GigE host controller cards.

[2] For more information on `StreamFrameRateConstrain`, see the GigE Features Reference.

[3] Camera firmware version 01.52.8151 shows minimum exposure values without frame overhead time, i.e., 1 µs. See sensor data sheet for details on frame overhead time.

Table 26: *Prosilica GT2050/GT2050NIR/GT2050C camera specifications (continued)*

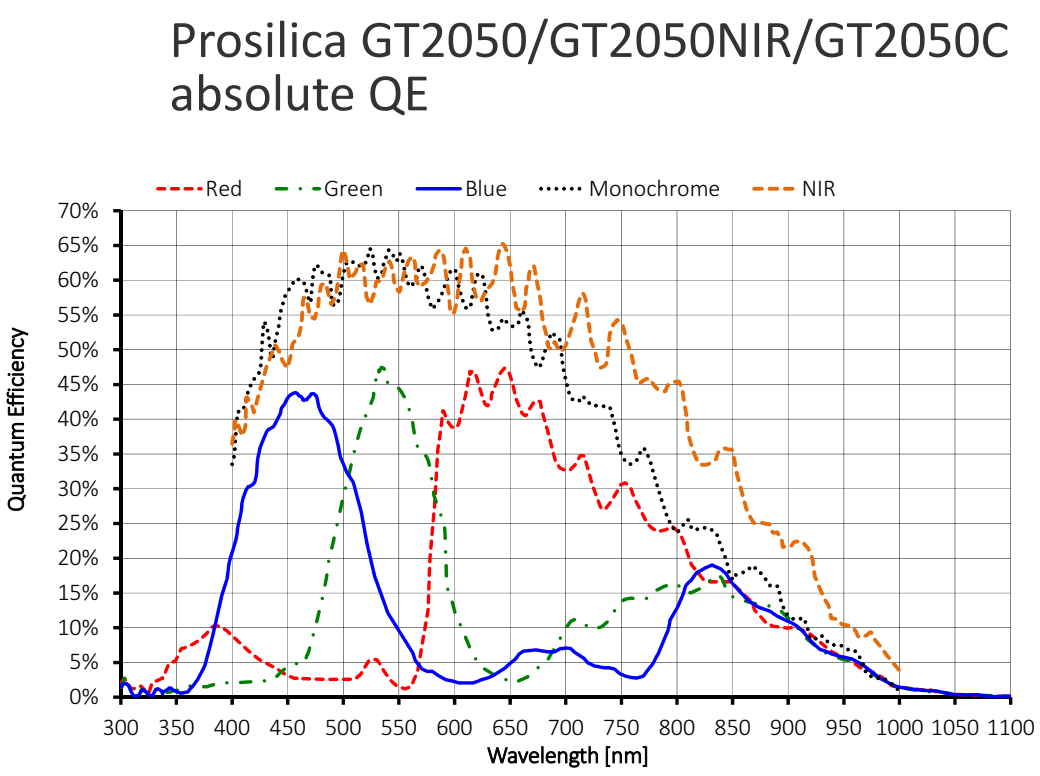


Figure 23: *Prosilica GT2050/GT2050NIR/GT2050C (CMOSIS CMV4000) absolute QE plot (without IR cut filter)*

ROI frame rate

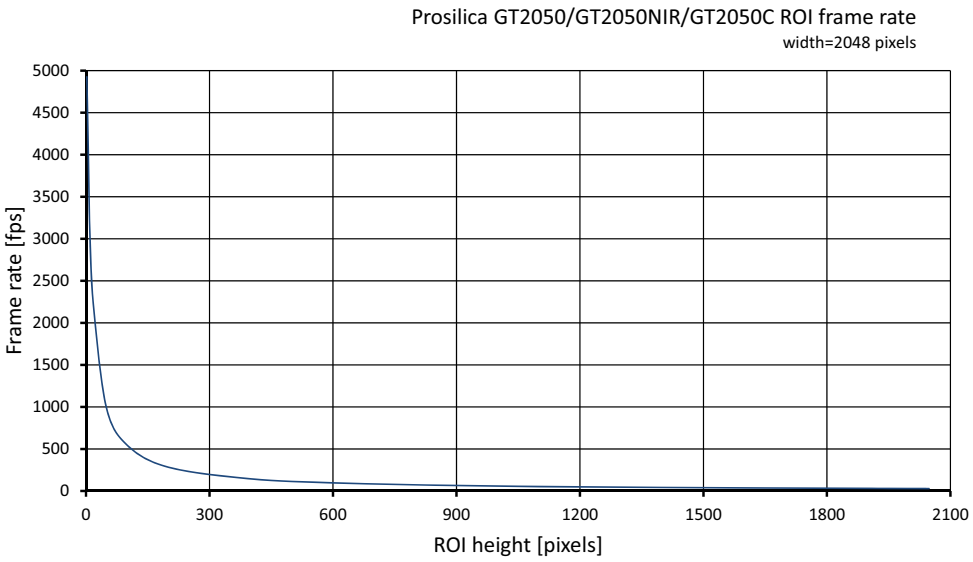


Figure 24: *Frame rate as a function of ROI height plot*

There will be an increase in frame rate with reduced width if the camera is bandwidth limited.

Height [pixels]	Frame rate [fps]
2048	28.6
2000	29.3
1800	32.6
1600	36.6
1400	41.8
1200	48.7
1000	58.4
800	72.9

Height [pixels]	Frame rate [fps]
600	96.8
400	144.3
200	283.1
100	545.3
50	981.4
20	2105.3
10	2949.9
2	4926.1

Table 27: *Frame rate as a function of ROI height values*

Prosilica GT2300/GT2300C

Feature	Specification
Resolution	2336 (H) x 1752 (V); 4.1 MP
Sensor	ON Semiconductor KAI-04050 TRUESENSE
Sensor type	Interline CCD, Progressive Scan
Sensor size	Type 1, 16.06 mm diagonal
Cell size	5.5 µm x 5.5 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Extended format
Maximum frame rate at full resolution	Four-tap mode: 29.3 fps One-tap mode: 8.7 fps
Maximum image bit depth	14-bit (mono), 12-bit (color)
Image buffer	128 MB
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGR8, BayerGR12, BayerRG12Packed
Exposure control	10 µs to 26.8 s; 1 µs increments
Gain control	0 to 32 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Four-tap Single-tap switchable in Vimba Viewer 2.0 or later
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	4.9 W @ 12 VDC 6.0 W PoE
Trigger latency	2.2 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +60 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	92 x 53.3 x 33 mm

Table 28: *Prosilica GT2300/GT2300C camera specifications*

Feature	Specification
Mass	229 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

Table 28: *Prosilica GT2300/GT2300C camera specifications (continued)*

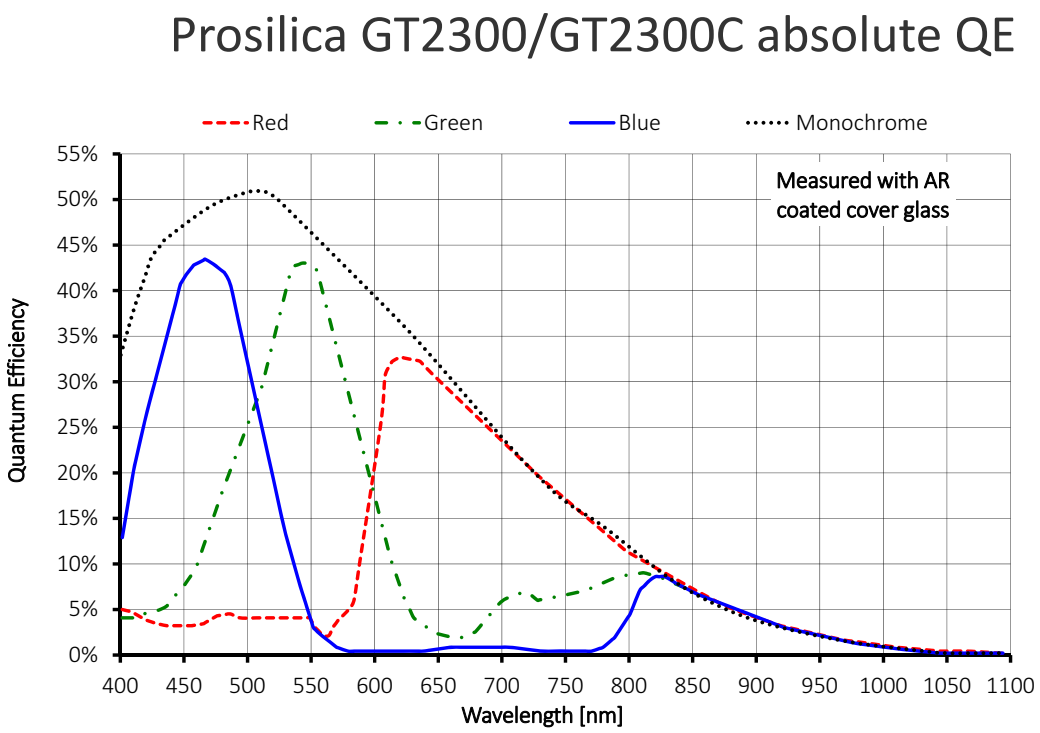


Figure 25: *Prosilica GT2300/GT2300C (OnSemi KAI-04050) absolute QE plot (without IR cut filter)*

ROI frame rate

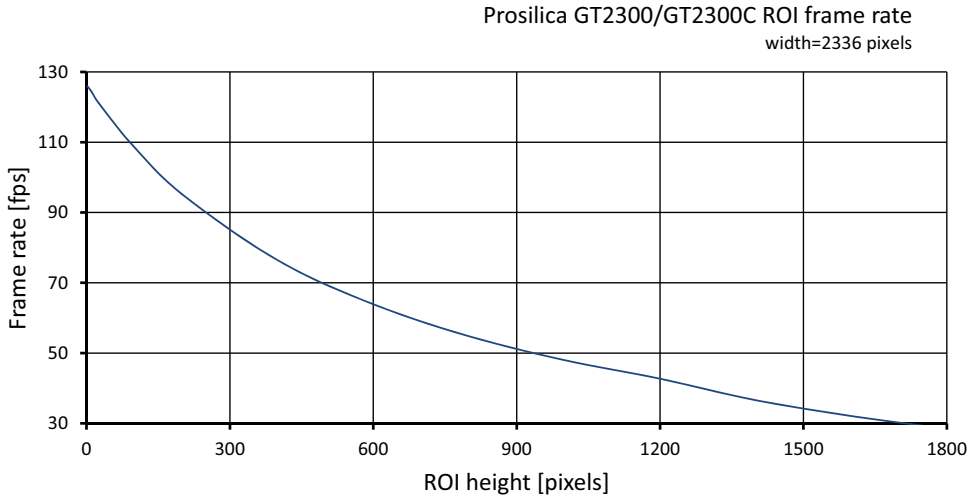


Figure 26: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
1752	29.3
1600	32.1
1400	36.6
1200	42.7
1000	48
800	54.8
600	63.9
400	76.4
200	95.2
100	108.6
50	116.8
20	122.2
10	124.5
2	125.9

Table 29: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	876	58.3
3	584	81.4
4	438	99.7
5	350	115.3
6	292	128.5

Table 30: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
7	250	140.0
8	218	148.9

Table 30: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT2450/GT2450C

Feature	Specification
Resolution	2448 (H) x 2050 (V) 5 MP
Sensor	GT2450: Sony ICX625ALA with Super HAD CCD™ technology GT2450C: Sony ICX625AQA with Super HAD CCD™ technology
Sensor type	Interline CCD, Progressive Scan
Sensor size	Type 2/3 11.016 mm diagonal
Cell size	3.45 µm x 3.45 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Standard format
Maximum frame rate at full resolution	15 fps
Maximum image bit depth	14-bit (mono), 12-bit (color)
Image buffer	128 MB
StreamHoldCapacity	13 frames at full resolution
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed
RAW formats	BayerRG8, BayerRG12, BayerRG12Packed
Exposure control	25 µs to 42.9 s; 1 µs increments
Gain control	0 to 30 dB
Binning	Horizontal: 1 to 4columns Vertical: 1 to 4 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Dual-tap
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	3.8 W @ 12 VDC 4.7 W PoE
Trigger latency	1.1 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +65 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)

Table 31: *Prosilica GT2450/GT2450C camera specifications*

Feature	Specification
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	86 x 53.3 x 33 mm
Mass	211 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

Table 31: *Prosilica GT2450/GT2450C camera specifications (continued)*

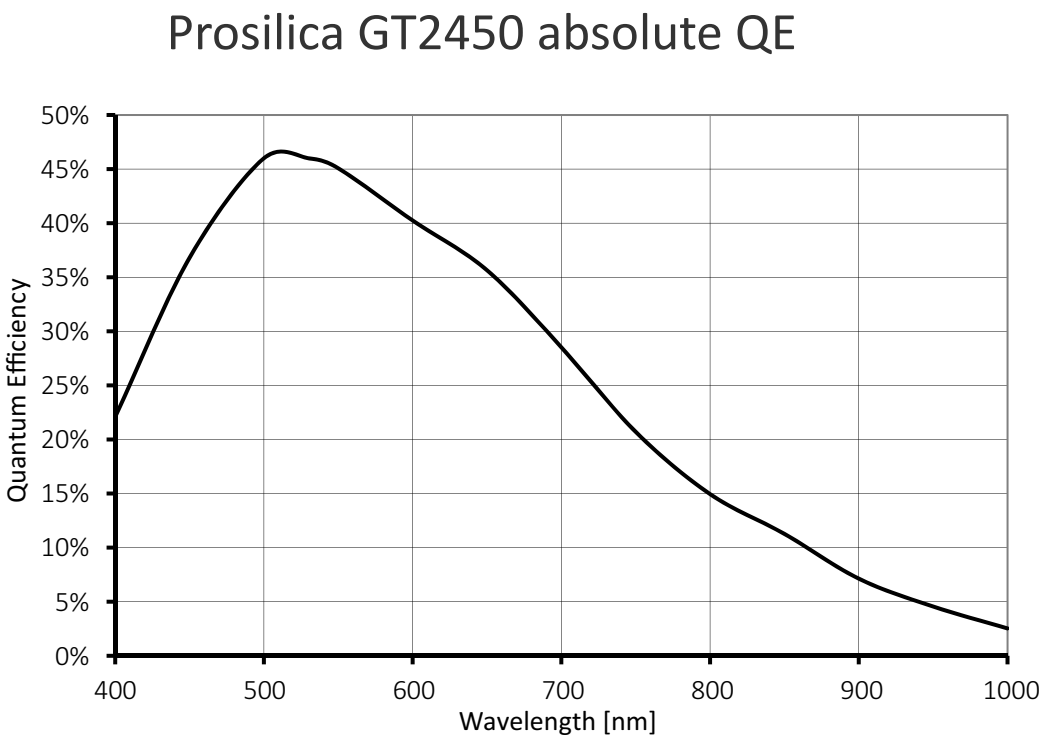


Figure 27: *Prosilica GT2450 (Sony ICX625) absolute QE plot*

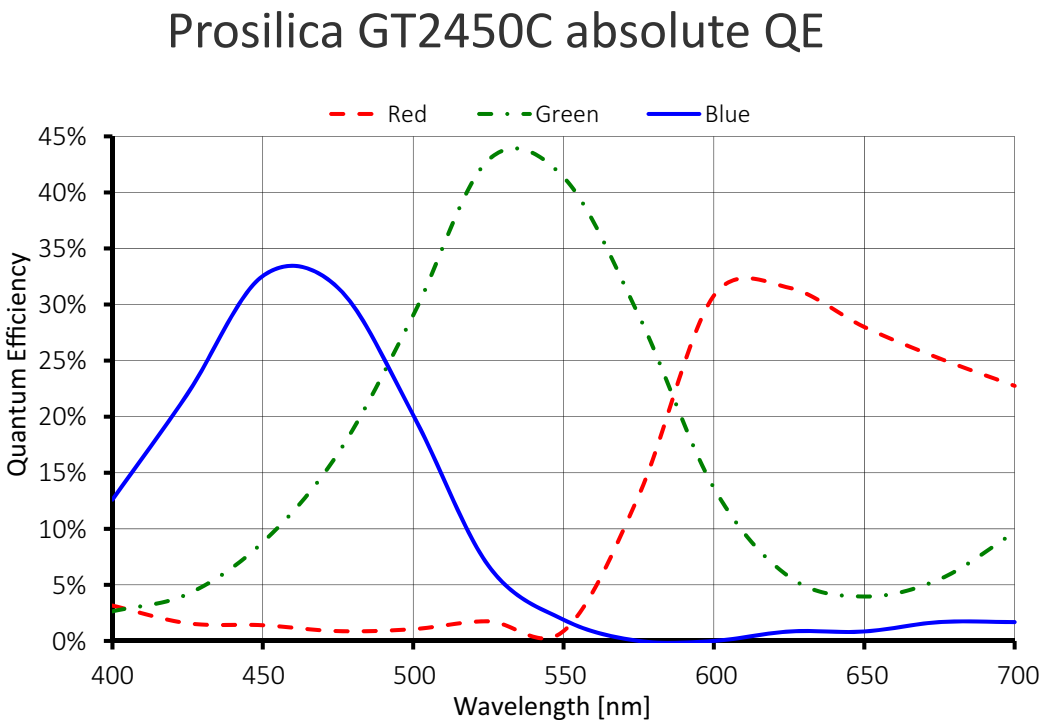


Figure 28: *Prosilica GT2450C (Sony ICX625) absolute QE plot (without IR cut filter)*

ROI frame rate

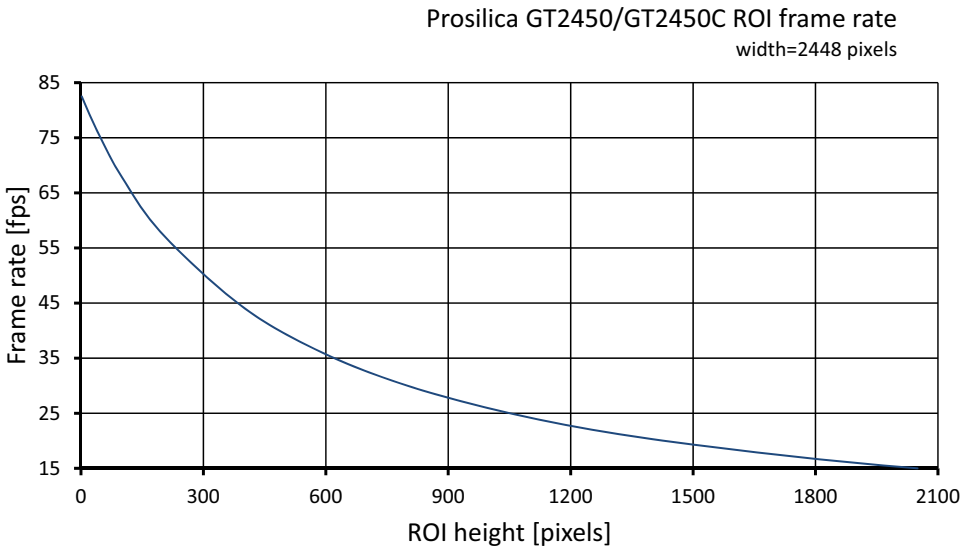


Figure 29: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
2050	15
2000	15.3
1800	16.7
1600	18.4
1400	20.3
1200	22.7
1000	25.9
800	30
600	35.7
400	44.1
200	57.5
100	67.9
50	74.7
20	79.4
10	81.1
2	82.5

Table 32: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	1025	25.4
3	683	33.1
4	512	38.9
5	410	43.4
6	341	47.1

Table 33: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
7	292	50.2
8	256	52.7
9	227	54.8
10	205	56.6
11	186	58.2
12	170	59.6
13	157	60.8
14	146	61.8

Table 33: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT2750/GT2750C

Feature	Specification
Resolution	2750 (H) x 2200 (V) 6.1 MP
Sensor	GT2750: Sony ICX694ALG with EXview HAD CCD II™ technology GT2750C: Sony ICX694AQG with EXview HAD CCD II™ technology
Sensor type	Interline CCD, Progressive Scan
Sensor size	Type 1 15.989 mm diagonal
Cell size	4.54 µm x 4.54 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Extended format
Maximum frame rate at full resolution	Four-tap mode: 19.8 fps One-tap mode: 5.7 fps
Maximum image bit depth	14-bit (mono), 12-bit (color)
Image buffer	128 MB
StreamHoldCapacity	21 frames at full resolution
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGR8, BayerGR12, BayerRG12Packed
Exposure control	10 µs to 26.8 s; 1 µs increments
Gain control	0 to 33 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Four-tap Single-tap switchable in Vimba Viewer 2.0 or later
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage Requirements	7 to 25 VDC; PoE
Power consumption	5.4 W @ 12 VDC 6.6 W PoE
Trigger latency	2.2 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +60 °C ambient temperature (without condensation)

Table 34: *Prosilica GT2750/GT2750C camera specifications*

Feature	Specification
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	92 x 53.3 x 33 mm
Mass	224 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

Table 34: *Prosilica GT2750/GT2750C camera specifications (continued)*

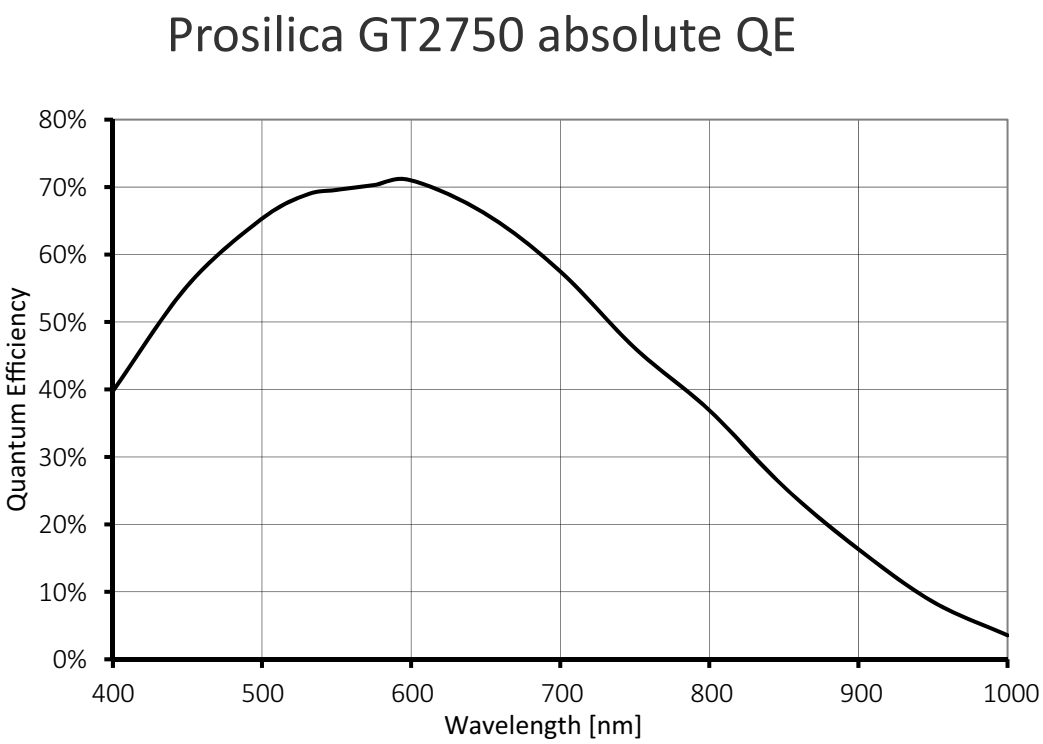


Figure 30: *Prosilica GT2750 (Sony ICX694) absolute QE plot*

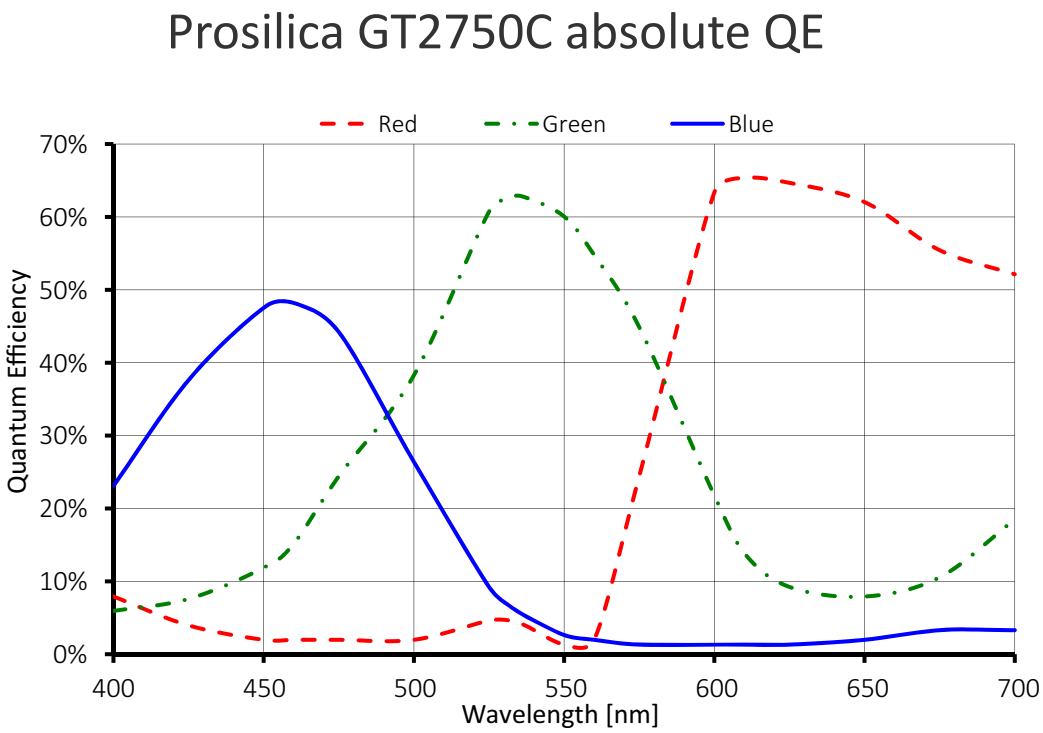


Figure 31: *Prosilica GT2750C (Sony ICX694) absolute QE plot (without IR cut filter)*

ROI frame rate

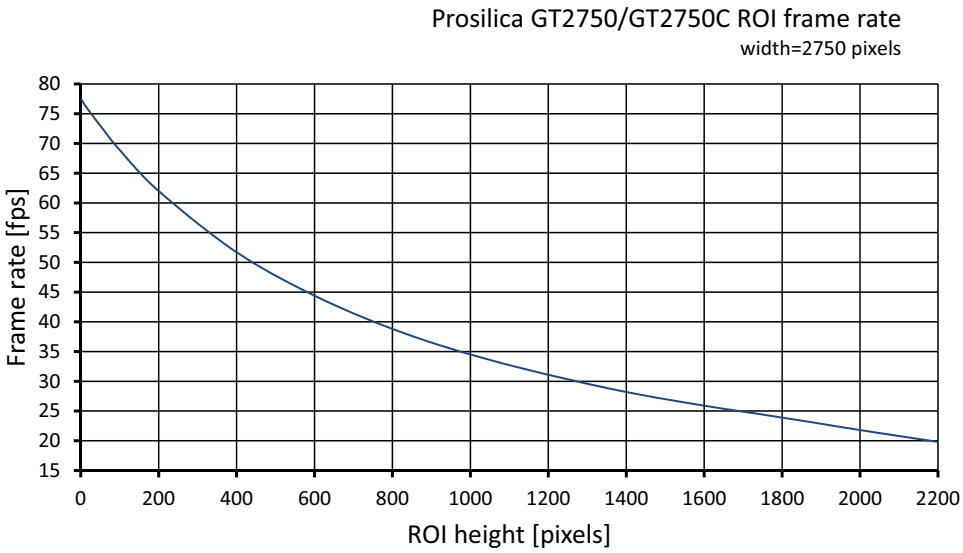


Figure 32: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
2200	19.8
2000	21.8
1800	23.9
1600	25.9
1400	28.2
1200	31.1
1000	34.5
800	38.8
600	44.4
400	51.7
200	62
100	68.9
50	73
20	75.6
10	76.5
2	77.4

Table 35: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	1100	37.0
3	732	50.2
4	550	60.9
5	440	70.0
6	366	77.4

Table 36: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
7	314	83.8
8	274	88.9

Table 36: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT3300/GT3300C

Feature	Specification
Resolution	3296 (H) x 2472 (V) 8.1 MP
Sensor	Cameras with order code 02-2622B, 02-2623B: ON Semiconductor KAI-08051 TRUESENSE Cameras with order code 02-2622A, 02-2623A: ON Semiconductor KAI-08050 TRUESENSE
Sensor Type	Interline CCD, Progressive Scan
Sensor size	Type 4/3 22.66 mm diagonal
Cell size	5.5 µm x 5.5 µm
Lens mount	Standard: F-Mount Optional: See the Modular Concept
Housing	Extended format
Maximum frame rate at full resolution	Four-tap mode: 14.7 fps One-tap mode: 4.5 fps
Maximum image bit depth	14-bit (mono), 12-bit (color)
Image buffer	128 MB
StreamHoldCapacity	16 frames at full resolution
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGR8, BayerGR12, BayerRG12Packed
Exposure control	10 µs to 26.8 s; 1 µs increments
Gain control	0 to 32 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Four-tap Single-tap switchable in Vimba Viewer 2.0 or later
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	5.6 W @ 12 VDC 6.9 W PoE
Trigger latency	2.2 µs
Trigger jitter	20 ns

Table 37: *Prosilica GT3300/GT3300C camera specifications*

Feature	Specification
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 to +60 °C ambient temperature (without condensation)
Storage temperature	-20 to +70 °C ambient temperature (without condensation)
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	121 x 59.7 x 59.7 mm
Mass	314 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ± 1 °C

Table 37: *Prosilica GT3300/GT3300C camera specifications (continued)*

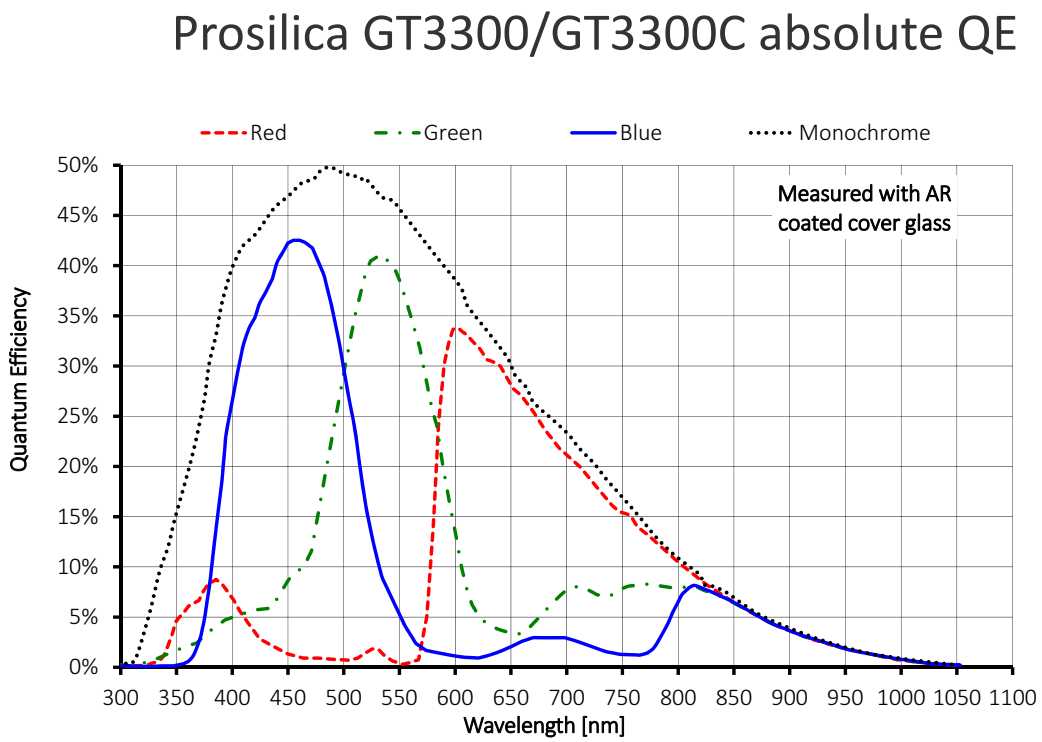


Figure 33: *Prosilica GT3300/GT3300C (OnSemi KAI-08051) absolute QE plot (without IR cut filter)*

ROI frame rate

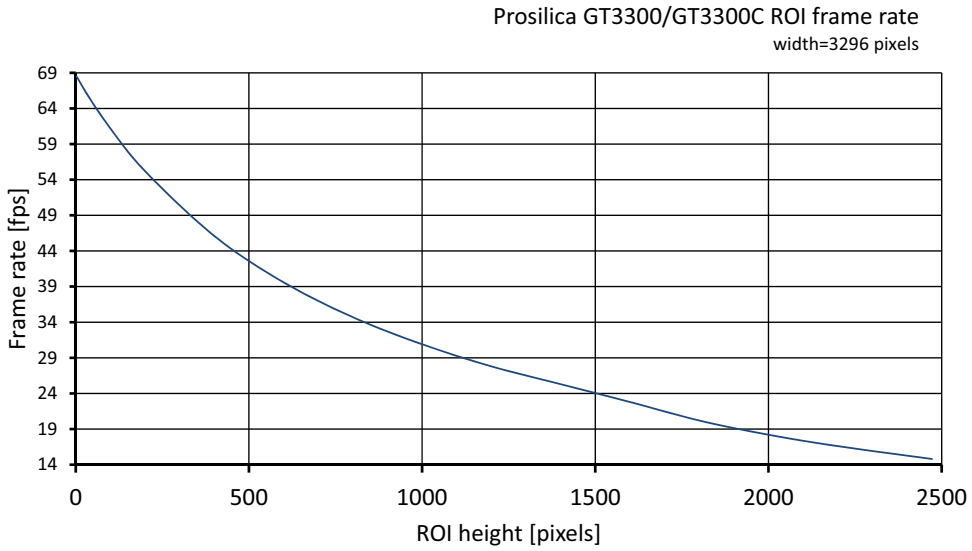


Figure 34: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
2472	14.8
2200	16.6
2000	18.2
1800	20.2
1600	22.8
1400	25.3
1200	27.8
1000	30.9
800	34.7
600	39.6
400	46.1
200	55.2
100	61.2
50	64.7
20	67
10	67.9
2	68.5

Table 38: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	1236	29.4
3	824	43.1
4	618	53.2
5	494	62.0

Table 39: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
6	412	69.5
7	352	75.8
8	308	81.4

Table 39: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT3400/GT3400C

Feature	Specification
Resolution	3384 (H) x 2704 (V) 9.2 MP
Sensor	GT3400: Sony ICX814ALG with EXview HAD II™ technology GT3400C: Sony ICX814AQG with EXview HAD II™ technology
Sensor type	Interline CCD, Progressive Scan
Sensor size	Type 1 15.972 mm diagonal
Cell size	3.69 µm x 3.69 µm
Lens mount	Standard: C-Mount Optional: See the Modular Concept
Housing	Extended format
Maximum frame rate at full resolution	Four-tap mode: 13.2 fps (14 fps burst mode[1]) One-tap mode: 3.8 fps
Maximum image bit depth	14-bit (mono), 12-bit (color)
Image buffer	128 MB
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerRG8, BayerRG12, BayerRG12Packed
Exposure control	10 µs to 26.8 s; 1 µs increments
Gain control	0 to 31 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Four-tap Single-tap switchable in Vimba Viewer 2.0 or later
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	5.4 W @ 12 VDC 6.6 W PoE
Trigger latency	2.5 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +60 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)

Table 40: *Prosilica GT3400/GT3400C camera specifications*

Feature	Specification
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	92 x 53.3 x 33 mm
Mass	224 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

[1] GigE host controller card with jumbo packets is required. See *Hardware Selection for Allied Vision GigE Cameras* application note for a list of recommended GigE host controller cards.

Table 40: *Prosilica GT3400/GT3400C camera specifications (continued)*

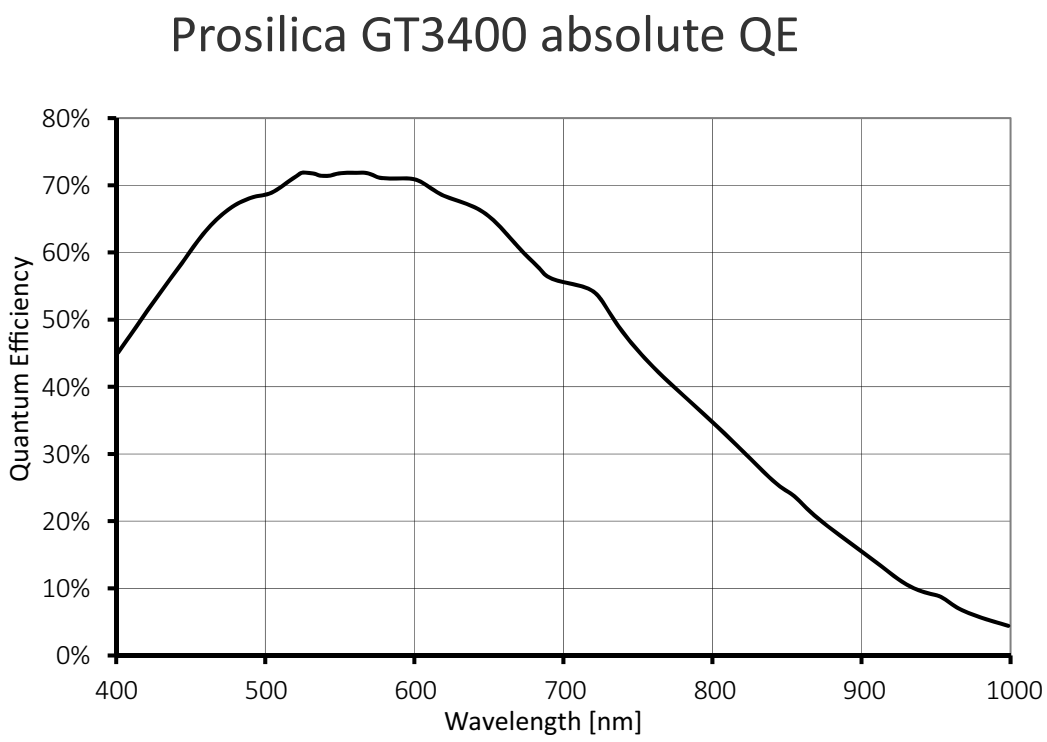


Figure 35: *Prosilica GT3400 (Sony ICX814) absolute QE plot*

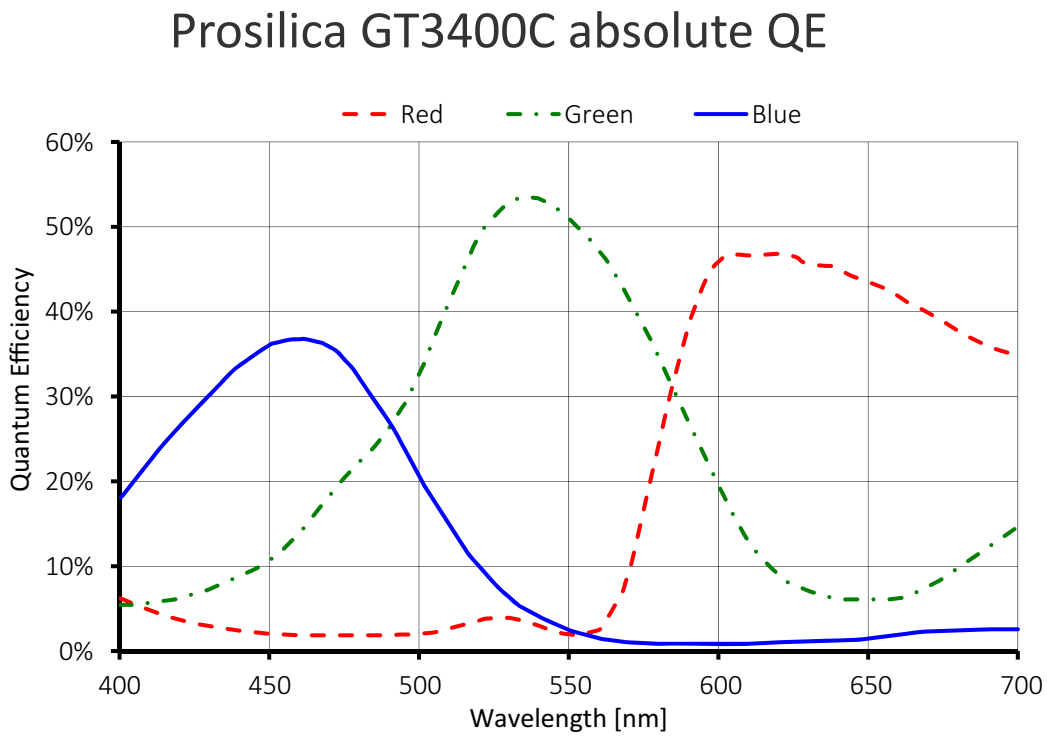


Figure 36: *Prosilica GT3400C (Sony ICX814) absolute QE plot (without IR cut filter)*

ROI frame rate

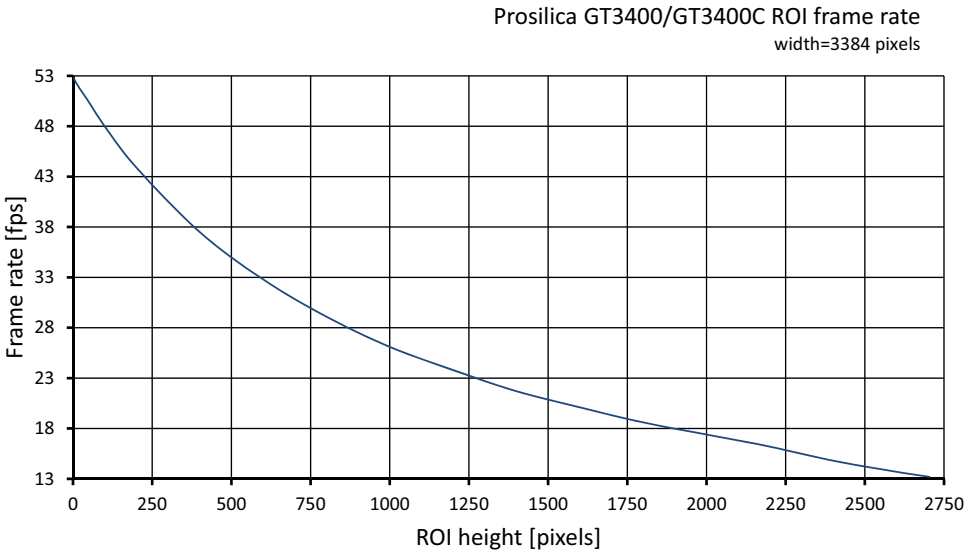


Figure 37: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
2704	13.2
2600	13.7
2400	14.8
2200	16.2
2000	17.4
1800	18.6
1600	20.1
1400	21.7
1200	23.8
1000	26.1
800	29.1
600	32.8
400	37.5
200	43.9
100	48
50	50.4
20	51.8
10	52.3
2	52.8

Table 41: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	1352	25.1
3	900	34.1
4	676	41.4
5	540	47.6

Table 42: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
6	450	52.8
7	386	57.2
8	338	61.0

Table 42: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT4905/GT4905C

Feature	Specification
Resolution	4896 (H) x 3264 (V) 16 MP
Sensor	ON Semiconductor KAI-16050 TRUESENSE
Sensor type	Interline CCD, Progressive Scan
Sensor size	APS-H Format 32.36 mm diagonal
Cell size	5.5 µm x 5.5 µm
Lens mount[1]	Standard: F-Mount Optional: See the Modular Concept
Housing	Large format
Maximum frame rate at full resolution	Four-tap mode: 7.5 fps (8.5 fps burst mode[2]) One-tap mode: 2.2 fps
Maximum image bit depth	14-bit (mono), 12-bit (color)
Image buffer	128 MB
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGR8, BayerGR12, BayerRG12Packed
Exposure control	15 µs to 26.8 s; 1 µs increments
Gain control	0 to 32 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows
Decimation	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Four-tap Single-tap switchable in Vimba Viewer 2.0 or later
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	7.3 W @ 12 VDC 9.0 W PoE
Trigger latency	2.5 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +50 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)

Table 43: *Prosilica GT4905/GT4905C camera specifications*

Feature	Specification
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	96 x 66 x 53.3 mm
Mass	372 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C

[1] To enable EF lens control on Prosilica GT cameras you must update firmware to version 01.54.14263 or later. EF lens control is only supported for cameras with EF lens mount (order option-18).

[2] GigE host controller card with jumbo packets is required. See the Hardware Selection for Allied Vision GigE Cameras application note for a list of recommended GigE host controller cards.

Table 43: *Prosilica GT4905/GT4905C camera specifications (continued)*

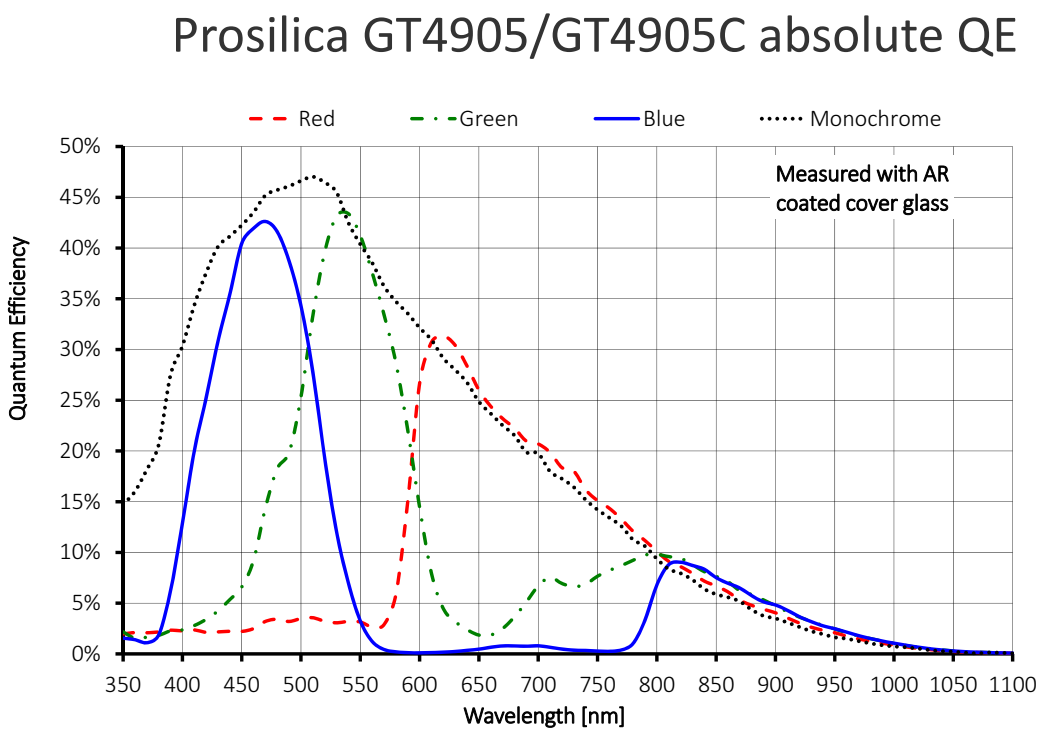


Figure 38: *Prosilica GT4905/GT4905C (OnSemi KAI-16050) absolute QE plot (without IR cut filter)*

ROI frame rate

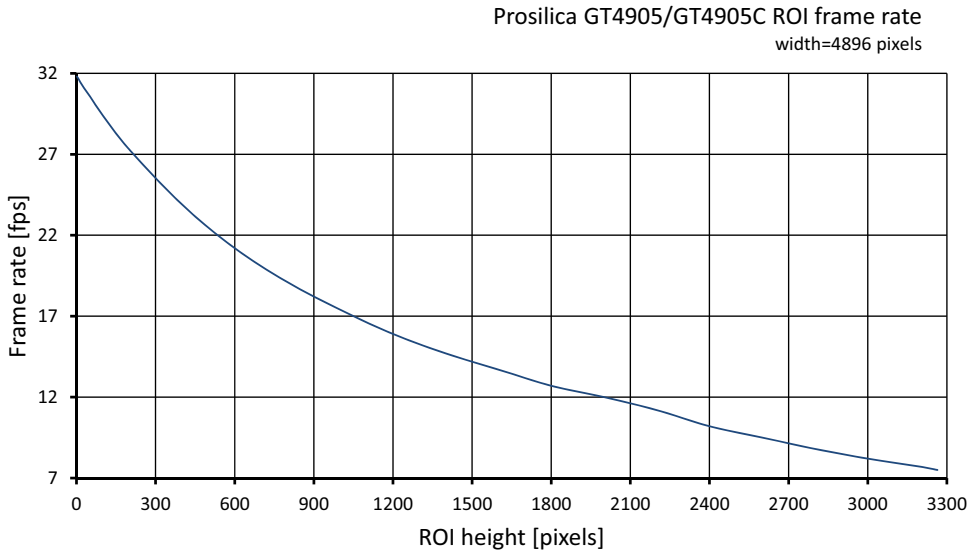


Figure 39: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
3264	7.5
3200	7.7
3000	8.2
2800	8.8
2600	9.5
2400	10.2
2200	11.2
2000	12
1800	12.7
1600	13.7
1400	14.7
1200	15.9
1000	17.4
800	19.1
600	21.2
400	23.9
200	27.3
100	29.4
50	30.6
20	31.3
10	31.6
2	31.8

Table 44: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	1632	15.1
3	1088	20.7
4	816	25.1

Table 45: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
5	652	28.8
6	544	31.8
7	466	34.4
8	408	36.6

Table 45: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT4907/GT4907C

Feature	Specification
Resolution	4864 (H) x 3232 (V) 15.7 MP
Sensor	ON Semiconductor KAI-16070 TRUESENSE
Sensor type	Interline CCD, Progressive Scan
Sensor size	35mm Optical Format 43.2 mm diagonal
Cell size	7.4 µm x 7.4 µm
Lens mount[1]	Standard: F-Mount Optional: See the Modular Concept
Housing	Large format
Maximum frame rate at full resolution	Four-tap mode: 7.6 fps One-tap mode: 2.2 fps
Maximum image bit depth	14-bit (mono), 12-bit (color)
Image buffer	128 MB
StreamHoldCapacity	8 frames at full resolution
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGR8, BayerGR12, BayerRG12Packed
Exposure control	35 µs to 26.8 s; 1 µs increments
Gain control	0 to 35 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Four-tap Single-tap switchable in Vimba Viewer 2.0 or later
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	7.7 W @ 12 VDC 9.5 W PoE
Trigger latency	2.5 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +50 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)

Table 46: *Prosilica GT4907/GT4907C camera specifications*

Feature	Specification
Operating humidity	20 to 80% non-condensing
Body dimensions (L x W x H)	96 x 66 x 53.3 mm
Mass	372 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C
[1] To enable EF lens control on Prosilica GT cameras you must update firmware to version 01.54.14263 or later. EF lens control is only supported for cameras with EF lens mount (order option-18).	

Table 46: *Prosilica GT4907/GT4907C camera specifications (continued)*

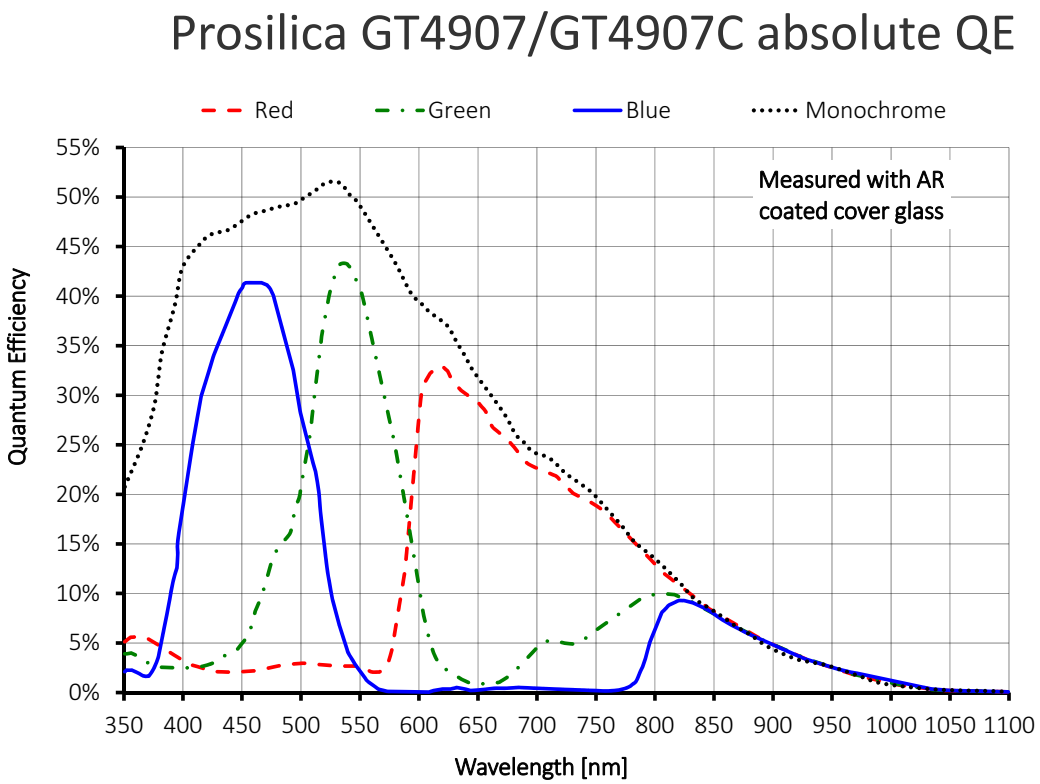


Figure 40: *Prosilica GT4907/GT4907C (OnSemi KAI-16070) absolute QE plot (without IR cut filter)*

ROI frame rate

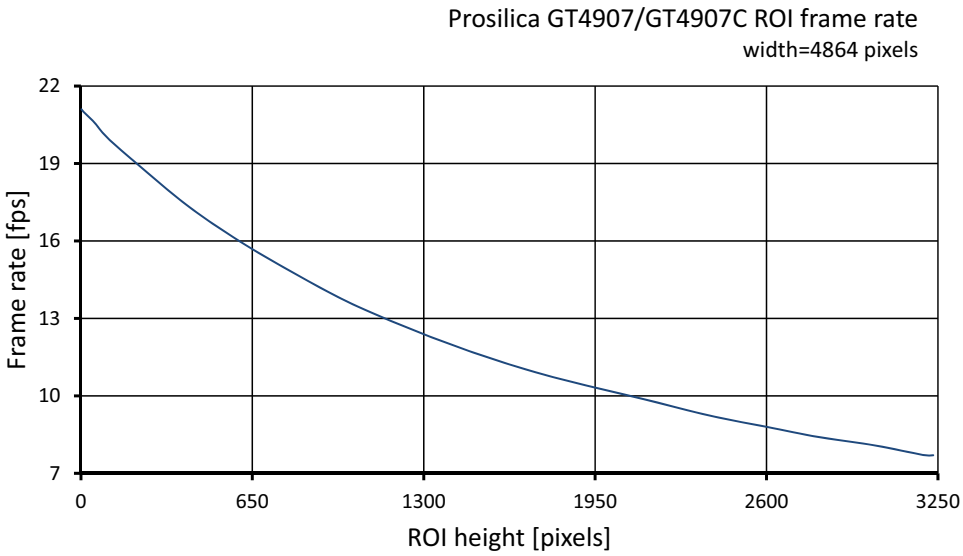


Figure 41: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
3232	7.7
3200	7.7
3000	8.1
2800	8.4
2600	8.8
2400	9.2
2200	9.7
2000	10.2
1800	10.7
1600	11.3
1400	12

Height [pixels]	Frame rate [fps]
1200	12.8
1000	13.7
800	14.8
600	16
400	17.4
200	19.1
100	20
50	20.6
20	20.9
10	21
2	21.1

Table 47: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	1616	12.5
3	1076	15.7
4	808	17.9

Table 48: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
5	646	19.6
6	538	21.0
7	460	21.9
8	404	22.7

Table 48: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT6600/GT6600C

Feature	Specification
Resolution	6576 (H) x 4384 (V) 28.8 MP
Sensor	ON Semiconductor KAI-29050 TRUESENSE
Sensor type	Interline CCD, Progressive Scan
Sensor size	35 mm Optical Format 43.47 mm diagonal
Cell size	5.5 µm x 5.5 µm
Lens mount[1]	Standard: F-Mount Optional: See the Modular Concept.
Housing	Large format
Maximum frame rate at full resolution	Four-tap mode: 4 fps One-tap mode: 1 fps
Maximum image bit depth	14-bit (mono), 12-bit (color)
Image buffer	128 MB
Monochrome formats	Mono8, Mono12, Mono12Packed, Mono14
Color formats (YUV)	YUV411Packed, YUV422Packed, YUV444Packed
Color formats (RGB)	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW formats	BayerGR8, BayerGR12, BayerRG12Packed
Exposure control	30 µs to 33.5 s; 1 µs increments
Gain control	0 to 32 dB
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows
Decimation X/Y	Horizontal and Vertical: 1, 2, 4, 8 factor
Sensor taps	Quad-tap Single-tap switchable in Vimba Viewer 2.0 or later
TTL (non-isolated) I/Os	1 input, 2 outputs
Opto-isolated I/Os	1 input, 2 outputs
RS232	1 TxD, 1 RxD
Voltage requirements	7 to 25 VDC; PoE
Power consumption	6.6 W @ 12 VDC 8.1 W PoE
Trigger latency	2.5 µs
Trigger jitter	20 ns
Propagation delay (t_{pd})	30 ns for non-isolated I/O; 70 ns for isolated I/O
Operating temperature	-20 °C to +50 °C ambient temperature (without condensation)
Storage temperature	-20 °C to +70 °C ambient temperature (without condensation)
Operating humidity	20 to 80% non-condensing

Table 49: *Prosilica GT6600/GT6600C camera specifications*

Feature	Specification
Body dimensions (L x W x H)	96 x 66 x 53.3 mm
Mass	372 g
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Interface standard	GigE Vision® Standard V1.2
Regulations	CE (2004/108/EC), RoHS (2011/65/EU), WEEE (2002/96/EC), FCC Class A
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C
[1] To enable EF lens control on Prosilica GT cameras you must update firmware to version 01.54.14263 or later. EF lens control is only supported for cameras with EF lens mount (order option-18).	

Table 49: *Prosilica GT6600/GT6600C camera specifications*

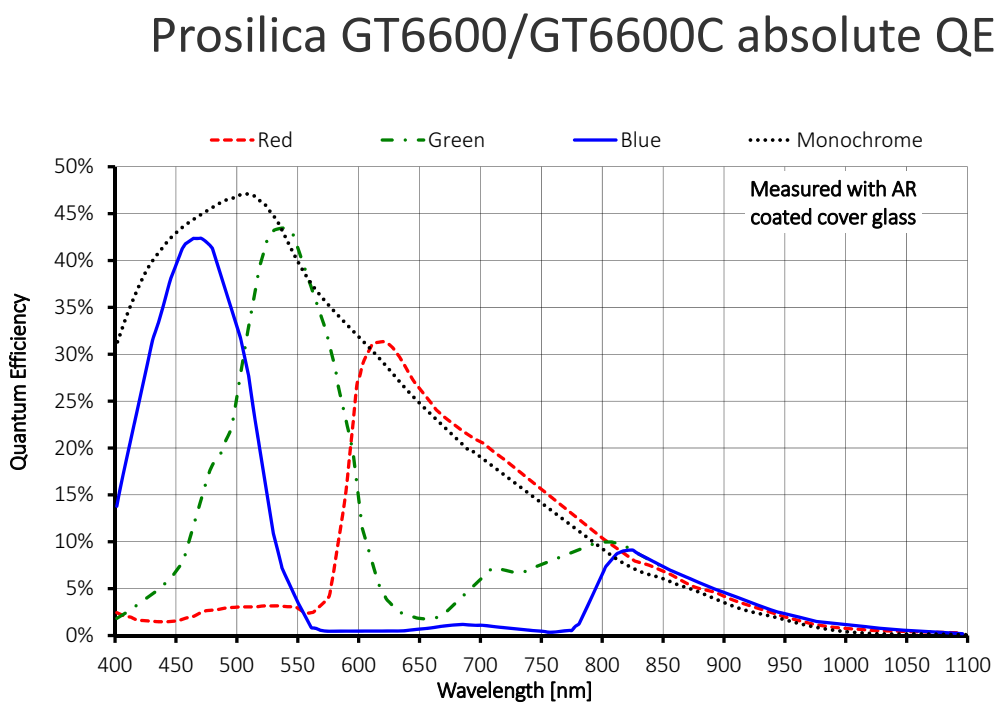


Figure 42: *Prosilica GT6600/GT6600C (OnSemi KAI-29050) absolute QE plot (without IR cut filter)*

ROI frame rate

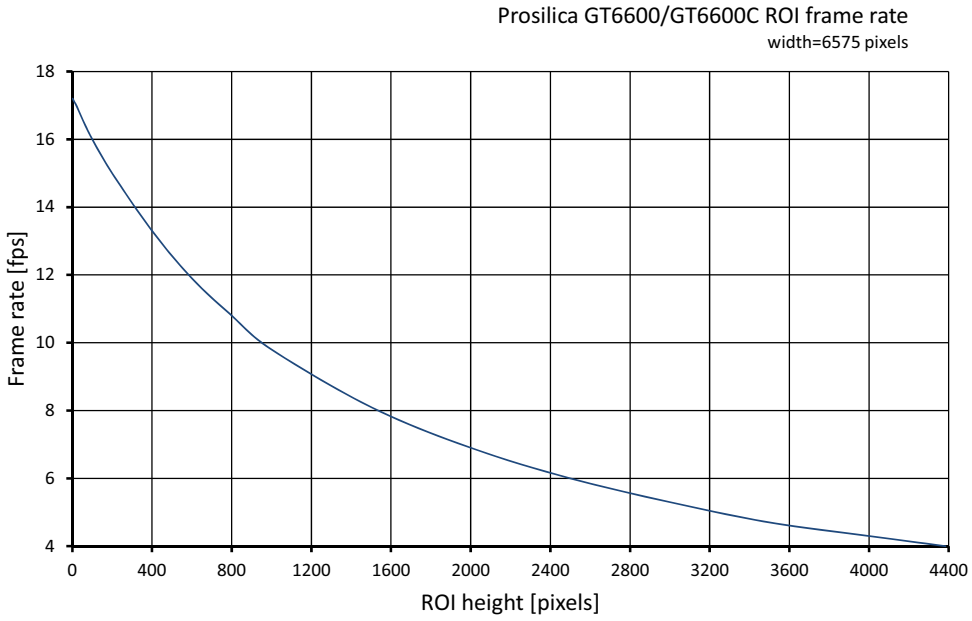


Figure 43: *Frame rate as a function of ROI height plot*

Height [pixels]	Frame rate [fps]
4384	4
4000	4.3
3500	4.7
3000	5.3
2500	6
2000	6.9
1500	8.1
1000	9.8
800	10.8
600	11.9
400	13.3
200	15
100	16
50	16.6
20	17
10	17.1
2	17.2

Table 50: *Frame rate as a function of ROI height values*

The following table shows how binning affects frame rate.

BinningVertical	Height [pixels]	Frame rate [fps]
2	2192	7.5
3	1460	10.4
4	1096	13.0
5	876	15.3

Table 51: *Frame rate as a function of ROI height with vertical binning enabled*

BinningVertical	Height [pixels]	Frame rate [fps]
6	730	17.3
7	626	19.1
8	548	20.7

Table 51: *Frame rate as a function of ROI height with vertical binning enabled (continued)*

Prosilica GT model comparison

Model	Sensor	Sensor type	Sensor format	Resolution	Frame rate	Sensor taps
GT1290/C	Sony ICX445	CCD	Type 1/3	1280 x 960	33.3 fps	Single-tap
GT1380/C	Sony ICX285	CCD	Type 2/3	1360 x 1024	30.5 fps	Single-tap
GT1600/C	Sony ICX274	CCD	Type 1/1.8	1620 x 1220	25.8 fps	Single-tap
GT1660/C	OnSemi KAI-02050	CCD	Type 2/3	1600 x 1200	62 fps[1]	Quad-tap/ Single-tap
GT1910/C	OnSemi KAI-02150	CCD	Type 2/3	1920 x 1080	57.5 fps[1]	Quad-tap/ Single-tap
GT1920/C	Sony ICX674	CCD	Type 2/3	1936 x 1456	40.7 fps [1]	Quad-tap/ Single-tap
GT1930/C	Sony IMX174	CMOS	Type 1/1.2	1936 x 1216	50.7 fps	Quad-tap
GT1930L/LC	Sony IMX174	CMOS	Type 1/1.2	1936 x 1216	50.7 fps	Quad-tap
GT2000/C	CMOSIS CMV2000	CMOS	Type 2/3	2048 x 1088	53.7 fps	Quad-tap
GT2000NIR	CMOSIS CMV2000	CMOS	Type 2/3	2048 x 1088	53.7 fps	Quad-tap
GT2050/C	CMOSIS CMV4000	CMOS	Type 1	2048 x 2048	28.6 fps	Quad-tap
GT2050NIR	CMOSIS CMV4000	CMOS	Type 1	2048 x 2048	28.6 fps	Quad-tap
GT2300/C	OnSemi KAI-04050	CCD	Type 1	2336 x 1752	29.3 fps[1]	Quad-tap/ Single-tap
GT2450/C	Sony ICX625	CCD	Type 2/3	2448 x 2050	15 fps	Dual-tap
GT2750/C	Sony ICX694	CCD	Type 1	2750 x 2200	19.8 fps[1]	Quad-tap/ Single-tap
GT3300/C	OnSemi KAI-08051	CCD	Type 4/3	3296 x 2472	14.7 fps[1]	Quad-tap/ Single-tap
GT3400/C	Sony ICX814	CCD	Type 1	3384 x 2704	13.2 fps[1]	Quad-tap/ Single-tap
GT4905/C	OnSemi KAI-16050	CCD	APS-H Format	4896 x 3264	7.5 fps[1]	Quad-tap/ Single-tap
GT4907/C	OnSemi KAI-16070	CCD	35mm Optical	4864 x 3232	7.6 fps[1]	Quad-tap/ Single-tap
GT6600/C	OnSemi KAI-29050	CCD	35mm Optical	6576 x 4384	4 fps[1]	Quad-tap/ Single-tap

[1] Frame rate reflects four-tap mode. See the specification tables for the frame rate for one-tap mode.

Table 52: *Prosilica GT camera overview*

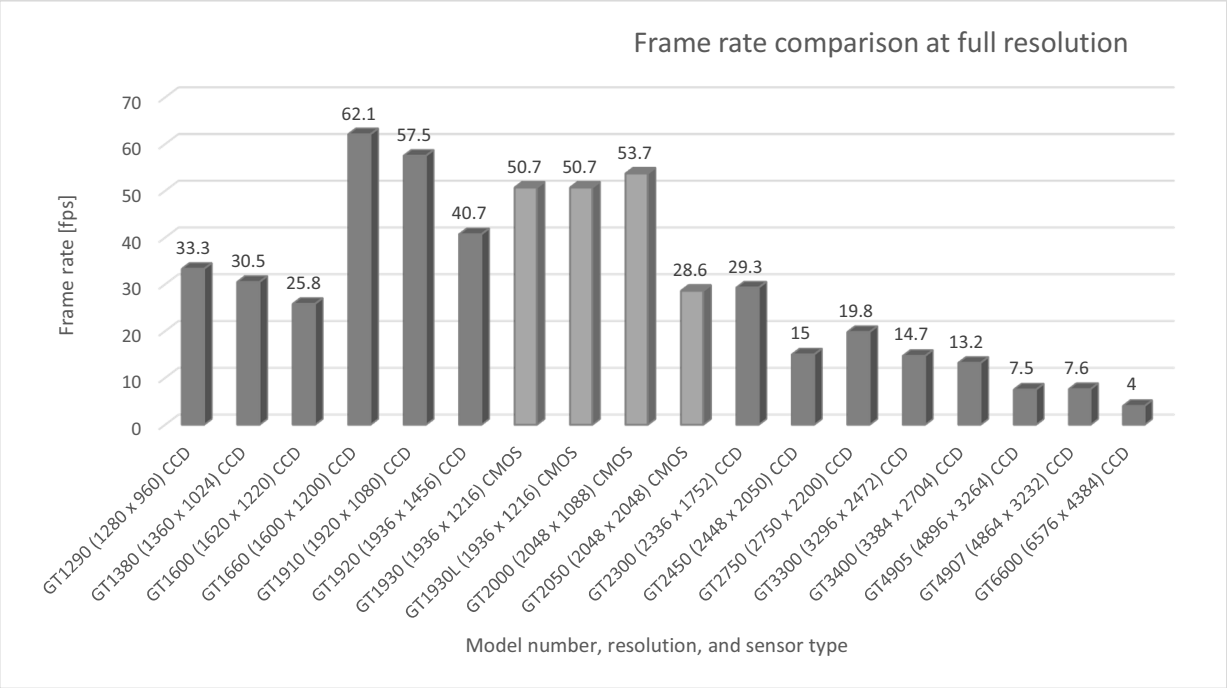


Figure 44: *Frame rate comparison plot*

Camera feature comparison

Allied Vision cameras support a number of standard and extended features. The table below identifies a selection of capabilities and compares the availability of features in Prosilica GT camera models.

Camera control documents

A complete listing of camera controls including control definitions can be found online.

- Vimba and third-party software users: GigE Features Reference
- PvAPI users: GigE Camera and Driver Attributes document

		GT1290	GT1380	GT1600	GT1660	GT1910	GT1920	GT1930	GT1930L	GT2000	GT2050	GT2300	GT2450	GT2750	GT3300	GT3400	GT4905	GT4907	GT6600
Image optimization features	Auto gain	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Auto exposure	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Auto white balance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Binning	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
	BlackLevel (Offset)							✓	✓	✓	✓								
	Color correction, hue, saturation[1]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Column defect masking[2]				✓	✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	✓
	Decimation X/Y[3]	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
	Gamma	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Look-up tables (LUTs)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Reverse X				✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
	Reverse Y				✓	✓	✓	✓	✓			✓		✓	✓	✓	✓	✓	✓
	Region of interest (ROI)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 53: *Camera feature comparison*

		GT1290	GT1380	GT1600	GT1660	GT1910	GT1920	GT1930	GT1930L	GT2000	GT2050	GT2300	GT2450	GT2750	GT3300	GT3400	GT4905	GT4907	GT6600
Camera control features	P-Iris and DC-Iris lens control	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓			
	EF lens control[4]								✓								✓	✓	✓
	Event channel	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Image chunk data	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IEEE 1588 precision time protocol (PTP)[5]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	RS232	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Storable user sets (config files)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Stream hold	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Sync out modes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Tap mode switchable in Vimba Viewer 2.0 or later[6]				✓	✓	✓					✓		✓	✓	✓	✓	✓	✓
	Temperature monitoring (main board and sensor board)	✓	✓	✓	✓	✓	✓	✓[7]	✓[7]	✓[7]	✓[7]	✓	✓	✓	✓	✓	✓	✓	✓

[1] Only available for color models.

[2] CCD cameras only: Column defect masking supported for quad-tap cameras running in single-tap mode

[3] The Decimation X/Y feature is available in firmware version 01.54.16845 or later.

[4] EF lens control is only supported for cameras with EF lens mount (order option-18).

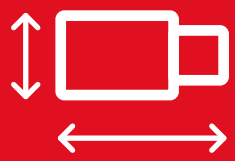
[5] Newer PTP implementation in firmware version 01.54.11026 or newer. Refer to the application notes for more information.

[6] To change the sensor tap mode on supported cameras you must update firmware to version 01.54.16845 or later.

[7] Temperature readout only available on the main board and not on the sensor board.

Table 53: *Camera feature comparison (continued)*

Mechanical dimensions



This chapter includes:

- CAD dRAWings and dimensions of both standard housing, extended, and large format housings, and tripod adapter
- Sensor position accuracy
- Maximum protrusion and filter diameter for C-Mount

The Prosilica GT family supports a range of sensor formats. To support this sensor variety, three housing formats are used:

- Prosilica GT standard format
- Prosilica GT extended format
- Prosilica GT large format

Prosilica GT cameras are available with different lens mount options. For more information see the Modular Concept document at:

https://www.alliedvision.com/en/support/technical-documentation.html

Prosilica GT standard format housing (C-Mount)

Prosilica GT1290, GT1380, GT1600, GT2000, GT2050, GT2450

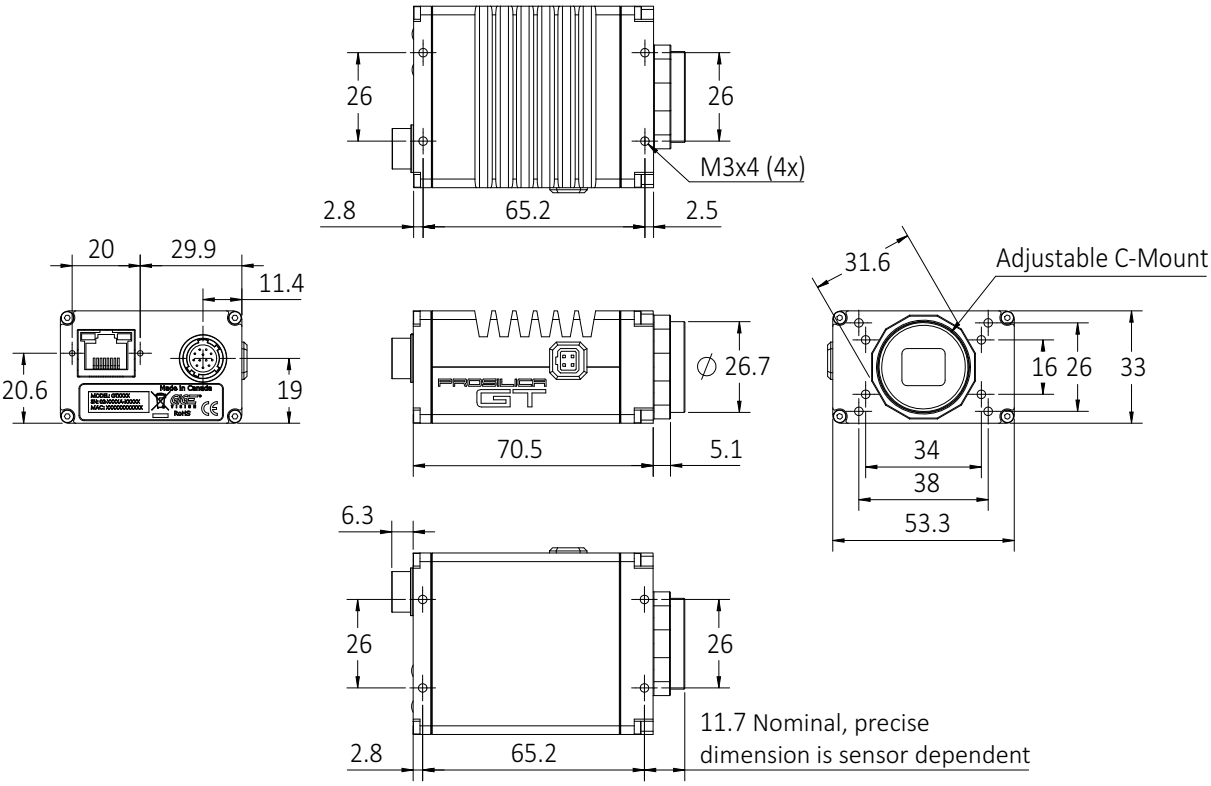


Figure 45: *C-Mount standard format housing dimensions*

Prosilica GT1930

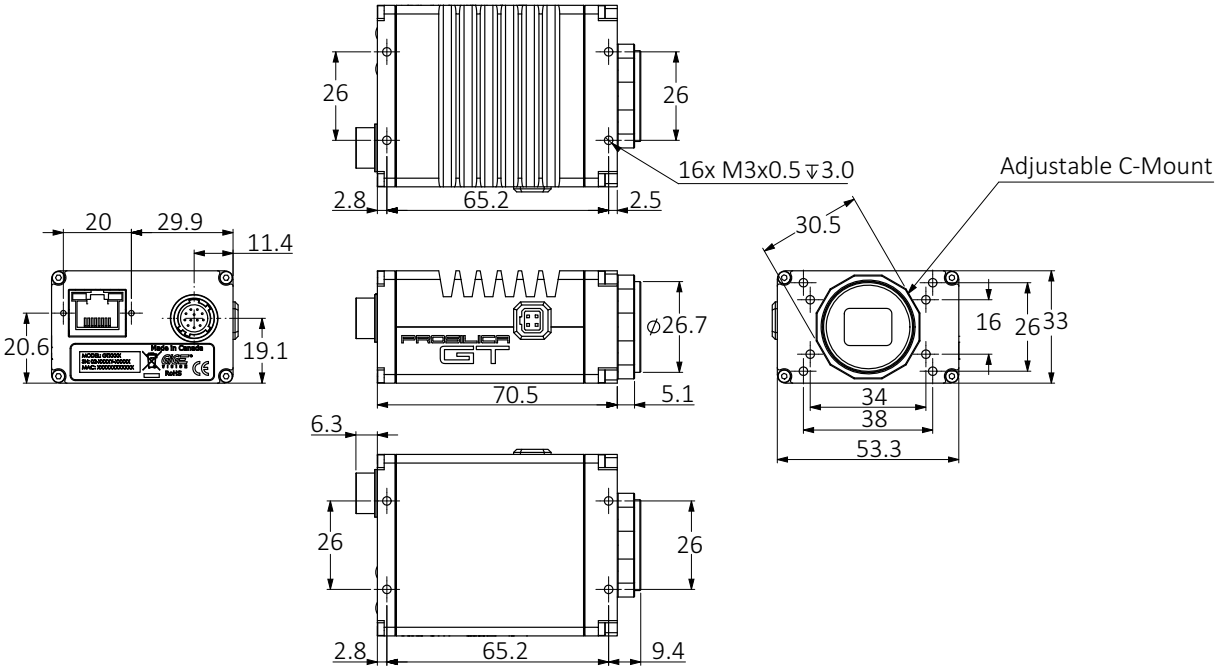


Figure 46: *Prosilica GT1930 C-Mount standard format housing dimensions*

Prosilica GT extended format housing (C-Mount)

Prosilica GT1660, GT1910, GT1920, GT2300, GT2750, GT3400

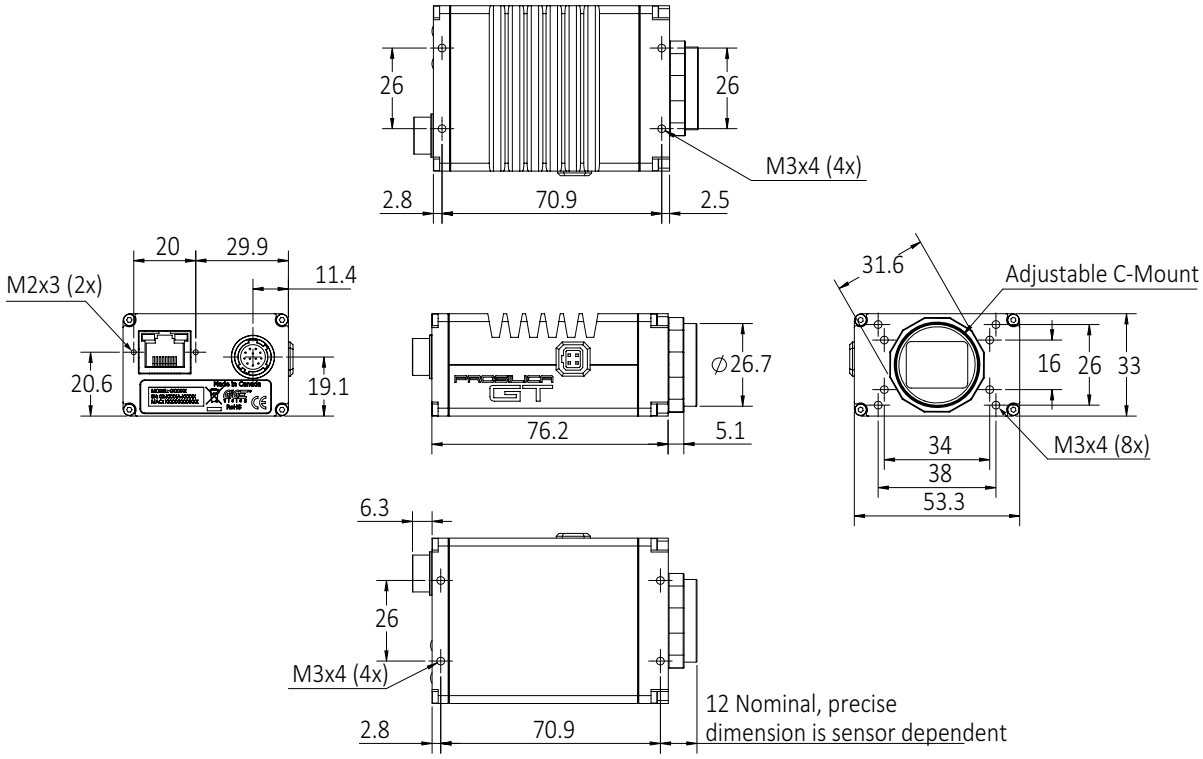


Figure 47: *C-Mount extended format housing dimensions*

Prosilica GT extended format housing (F-Mount)

Prosilica GT3300

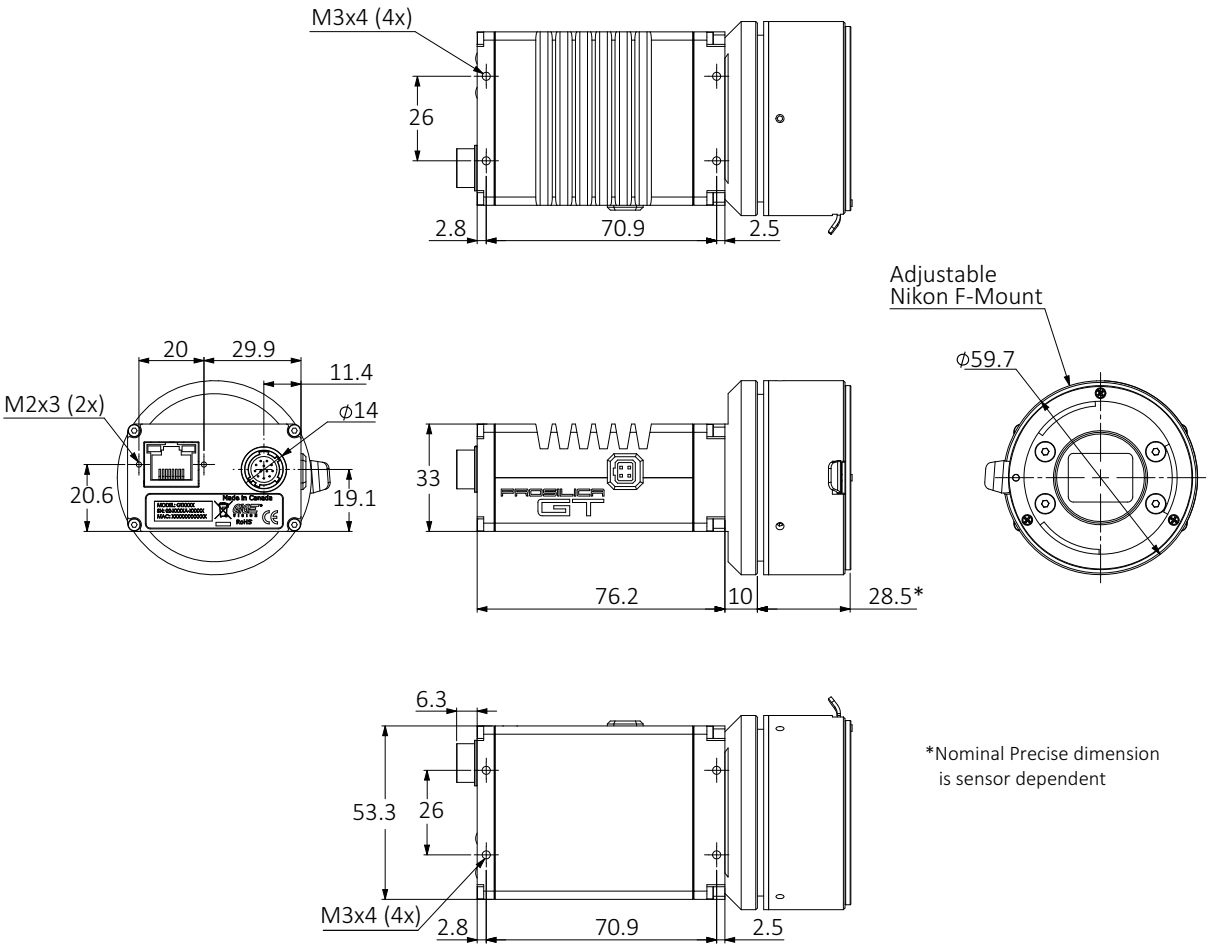


Figure 48: *Prosilica GT3300 F-Mount extended format housing dimensions*

Prosilica GT large format housing

EF-Mount PA (planarity adjustable)

Prosilica GT1930L, GT4905, GT4907, GT6600

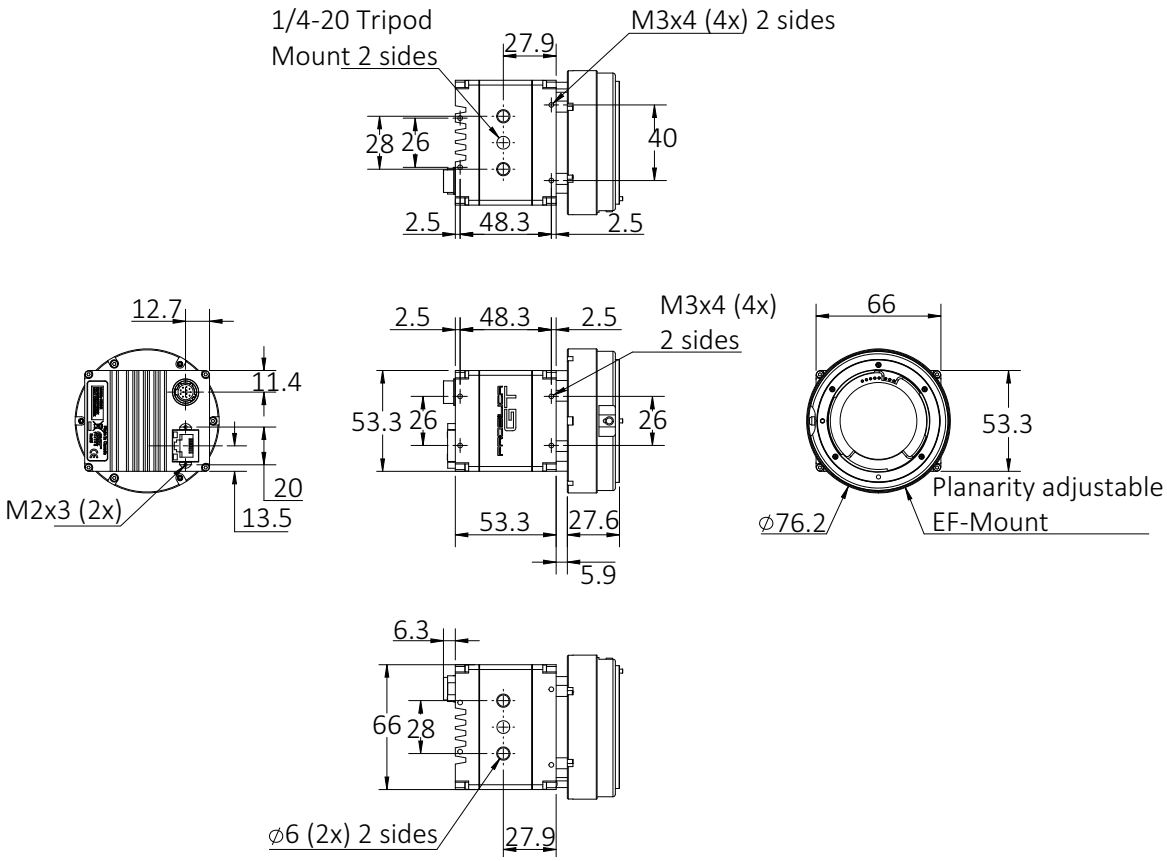


Figure 49: *EF-Mount PA large format camera dimensions*

Modifying the factory default adjustment is under the responsibility of the user. Please exercise caution when modifying the planarity adjustment. Use a 1.5 mm hex ball driver to loosen the three spring loaded bolts, adjust the tilt adjustment screws as required, then secure the bolts.

F-Mount

Prosilica GT1930L, GT4905, GT4907, GT6600

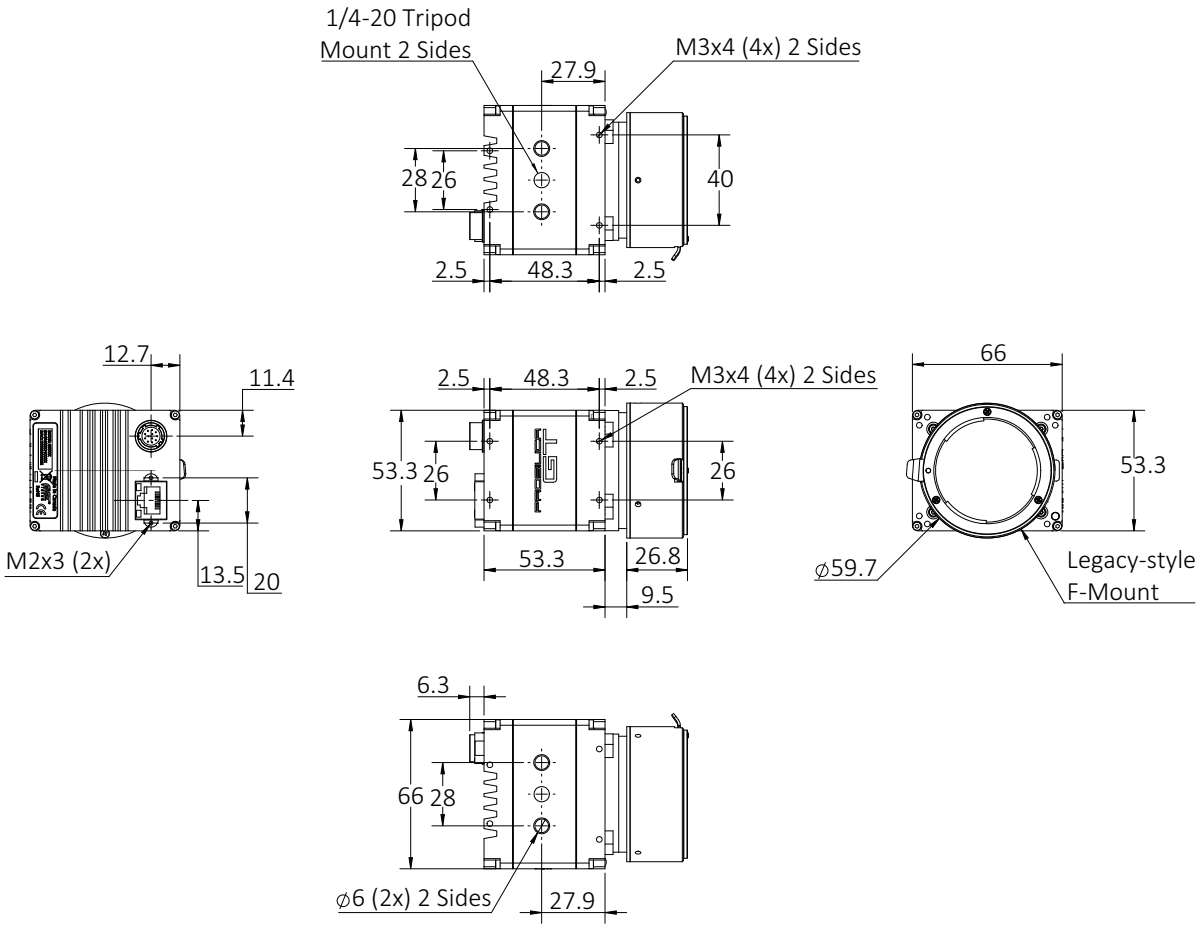


Figure 50: *F-Mount large format camera dimensions*

F-Mount PA (planarity adjustable)

Prosilica GT1930L, GT4905, GT4907, GT6600

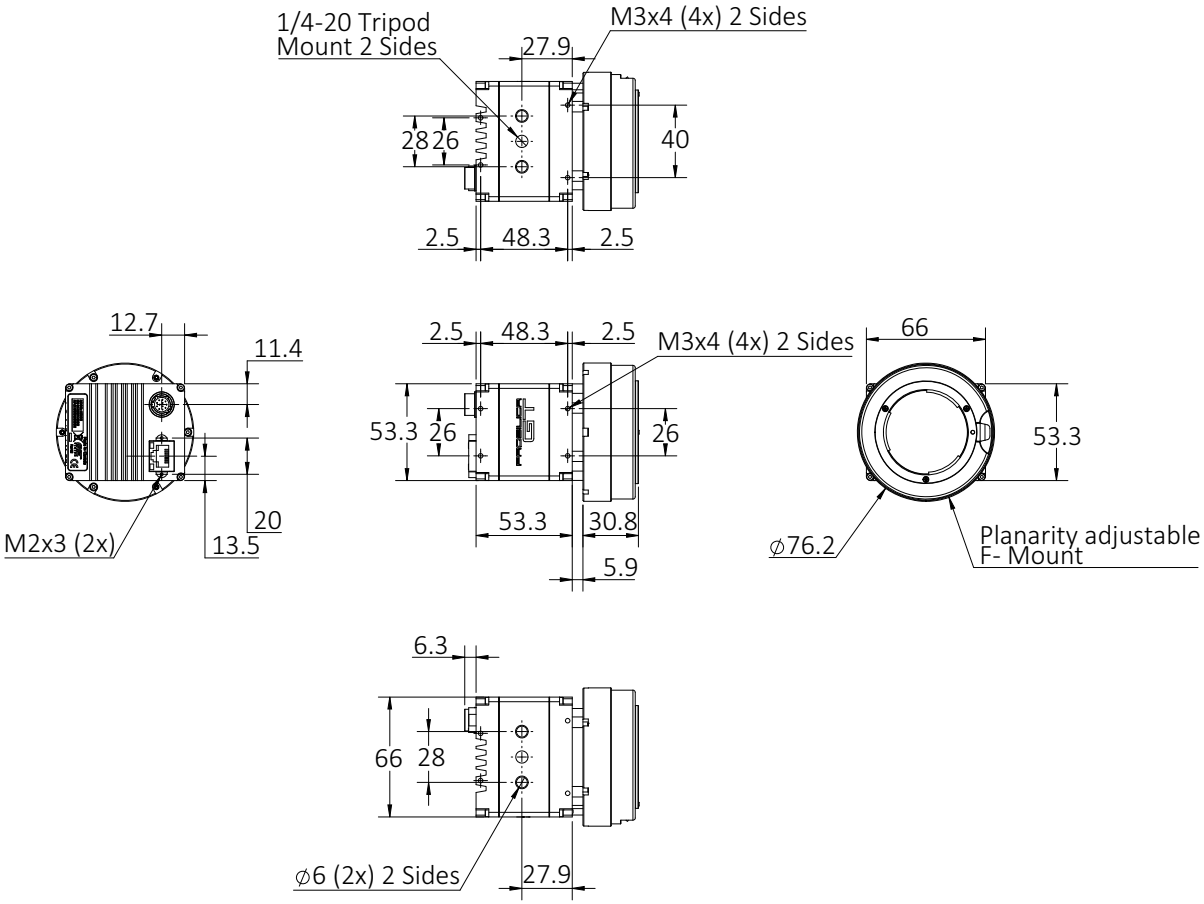


Figure 51: *F-Mount PA large format camera dimensions*

Modifying the factory default adjustment is under the responsibility of the user. Please exercise caution when modifying the planarity adjustment. Use a 1.5 mm hex ball driver to loosen the three spring loaded bolts, adjust the tilt adjustment screws as required, then secure the bolts.

M42-Mount PA (planarity adjustable)

Prosilica GT1930L, GT4905, GT4907, GT6600

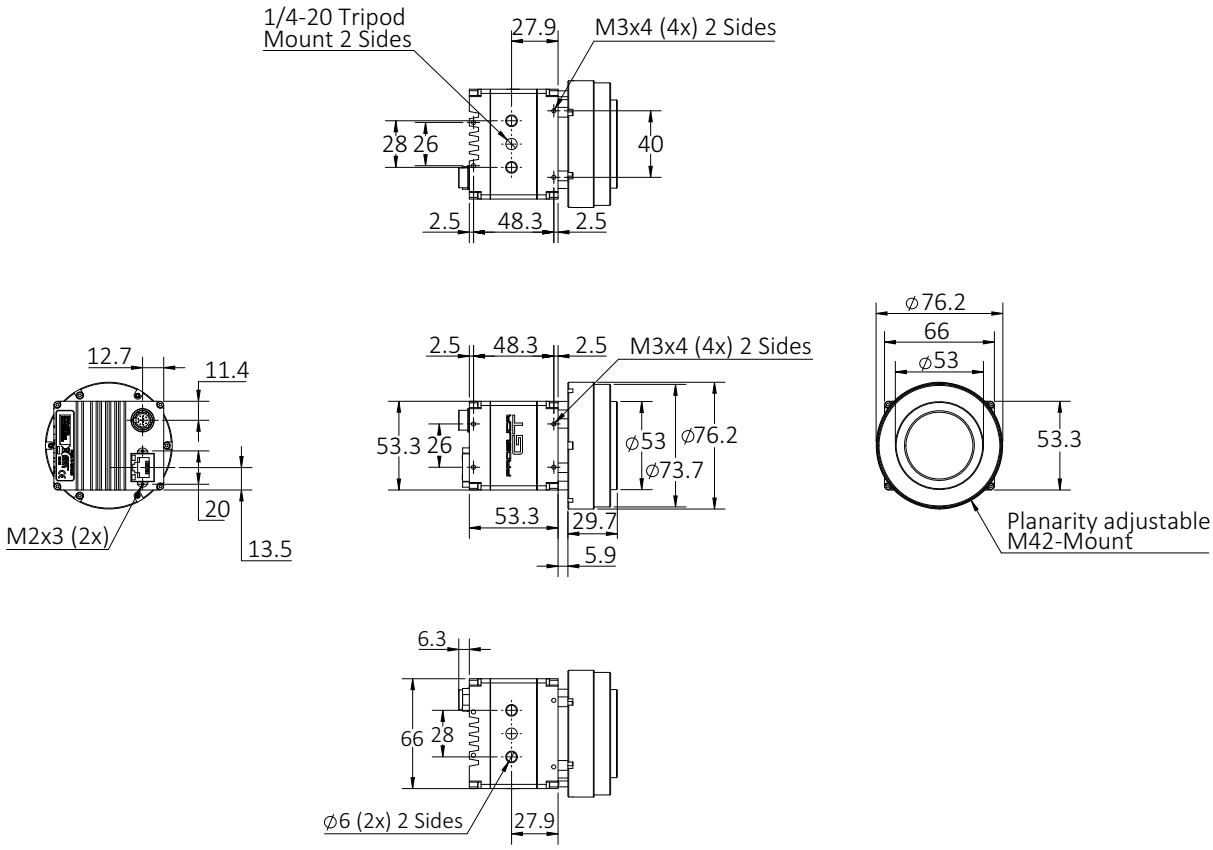


Figure 52: *M42-Mount PA large format camera dimensions*

Modifying the factory default adjustment is under the responsibility of the user. Please exercise caution when modifying the planarity adjustment. Use a 1.5 mm hex ball driver to loosen the three spring loaded bolts, adjust the tilt adjustment screws as required, then secure the bolts.

M42-Mount

Prosilica GT1930L, GT4905, GT4907, GT6600

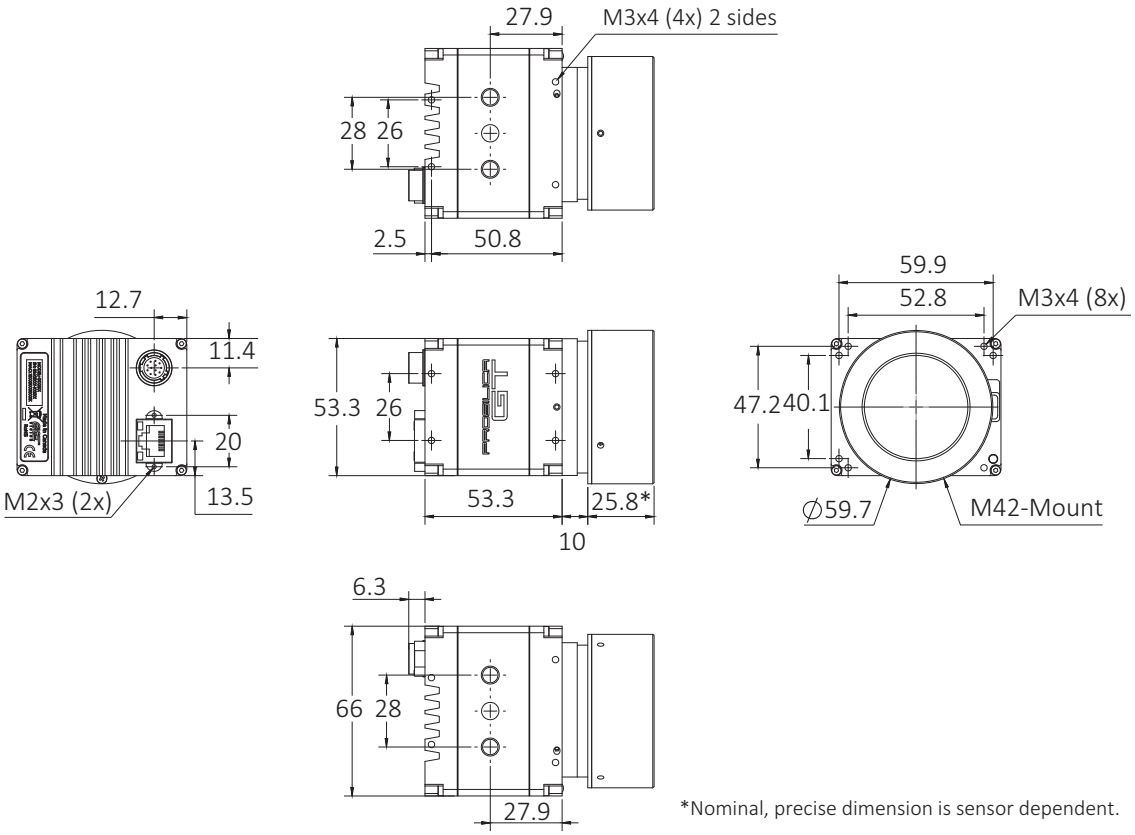


Figure 53: *M42-Mount large format camera dimensions*

M58-Mount PA (planarity adjustable)

Prosilica GT1930L, GT4905, GT4907, GT6600

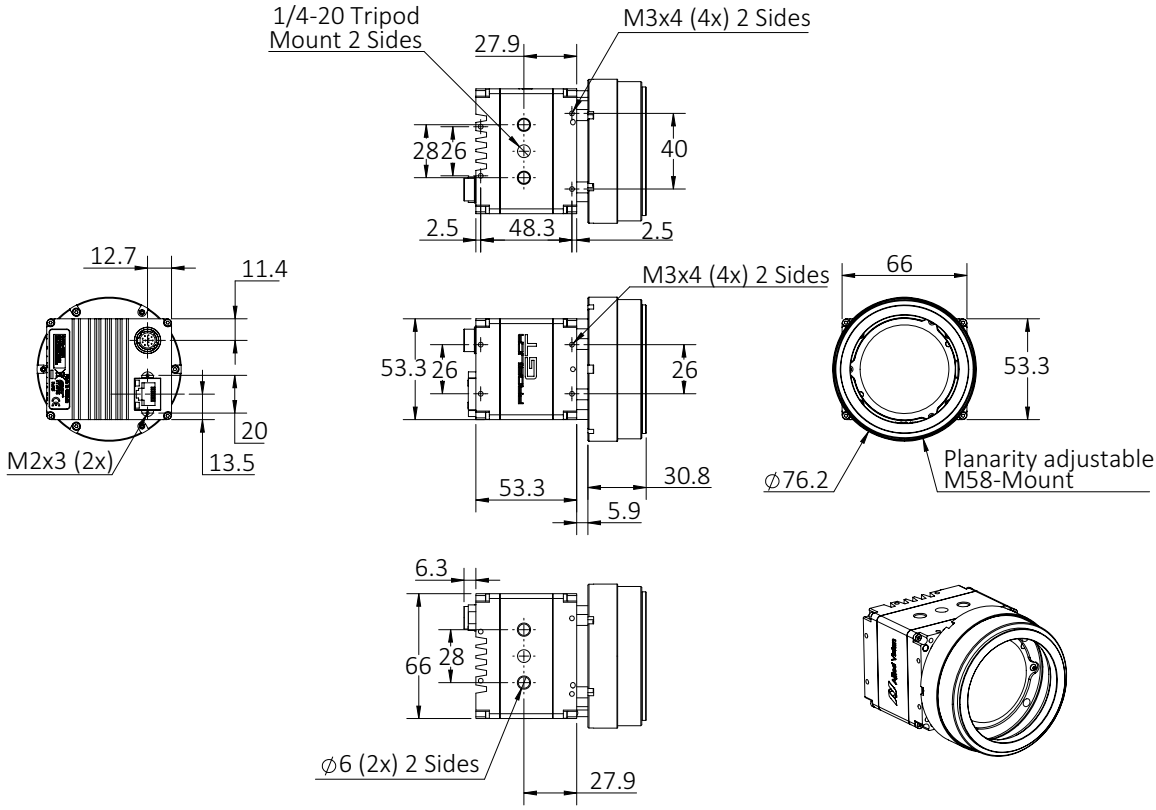


Figure 54: *M58-Mount PA large format camera dimensions*

Modifying the factory default adjustment is under the responsibility of the user. Please exercise caution when modifying the planarity adjustment. Use a 1.5 mm hex ball driver to loosen the three spring loaded bolts, adjust the tilt adjustment screws as required, then secure the bolts.

M58-Mount

Prosilica GT1930L, GT4905, GT4907, GT6600

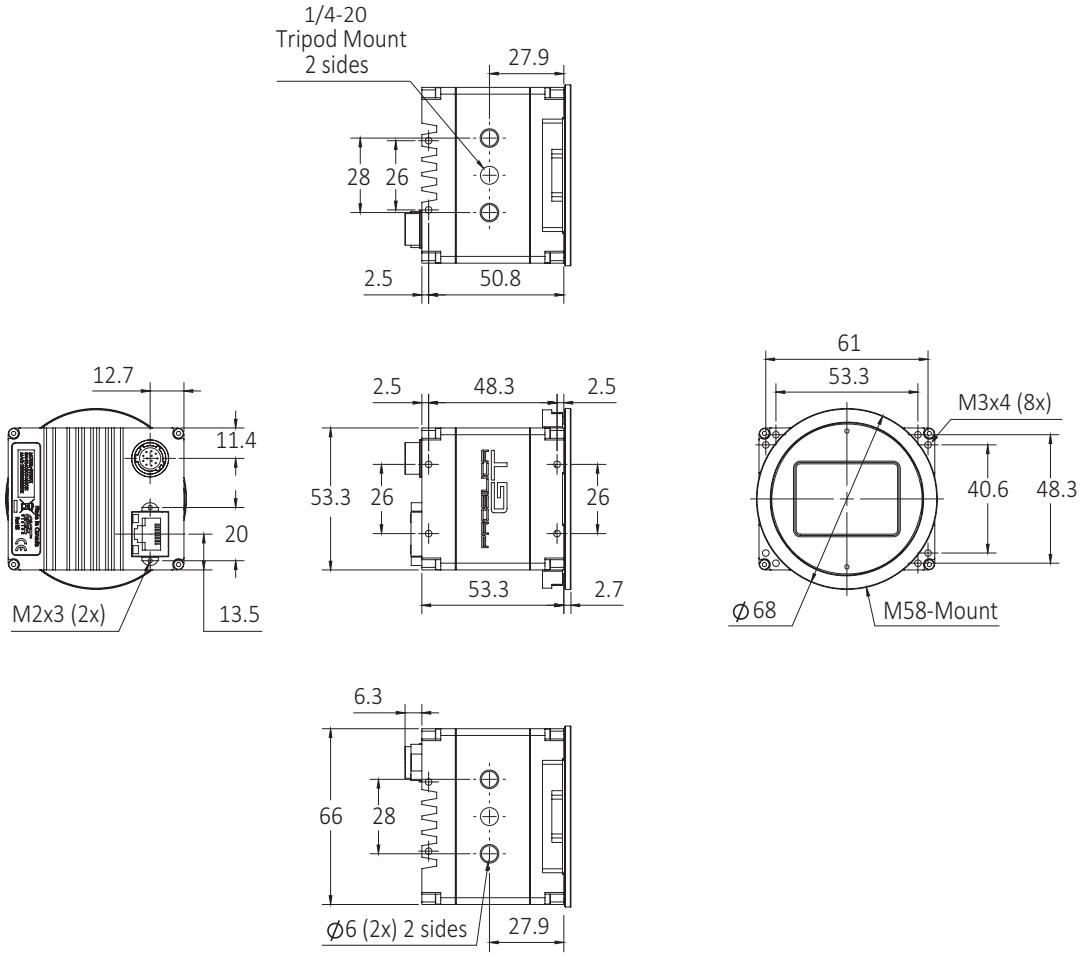


Figure 55: *M58-Mount large format camera dimensions*

Tripod adapter

Prosilica GT standard and extended cameras can be mounted on a camera tripod by using the Prosilica GT mounting plate.

Prosilica GT mounting plate

Contact the Allied Vision sales team to purchase the Prosilica GT series mounting plate (order code 02-5036A).

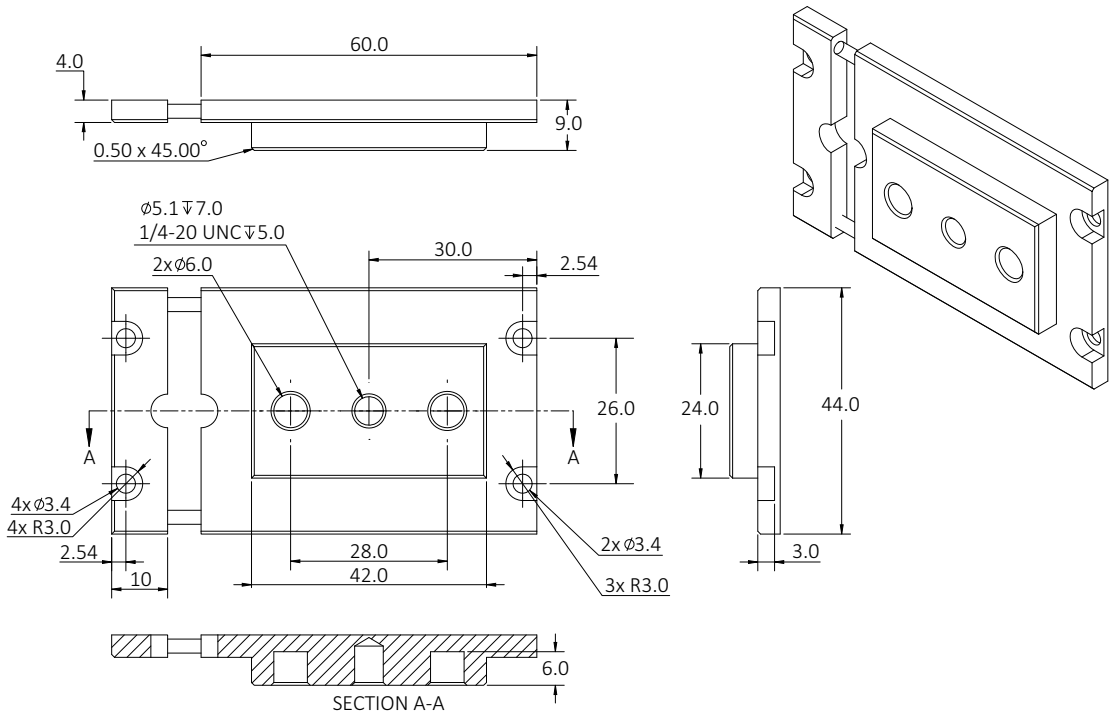


Figure 56: *Tripod mounting plate for Prosilica GT standard and extended cameras*

Prosilica GT large format cameras can be mounted on a camera tripod by using the tripod mount hole integrated into the camera body.

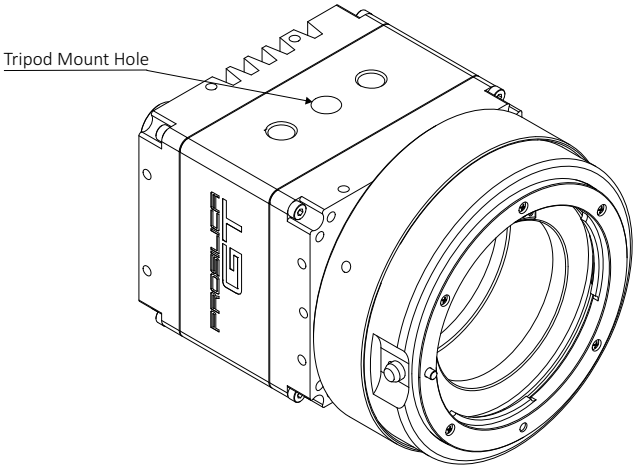


Figure 57: *Integrated tripod mount holes for Prosilica GT large format cameras*

Flange focal distance

C-Mount

Flange focal distance is the optical distance from the mounting flange to image sensor die. Prosilica GT C-Mount cameras are calibrated to a standard 17.526 mm flange focal distance, with a ±10 µm tolerance.

CS-Mount

Prosilica GT cameras are shipped with adjustable C-Mount. Cameras can also be built with a CS-Mount with a standard 12.50 mm flange focal distance and a ± 10 µm tolerance. For more information, see the *Modular Concept*:

https://www.alliedvision.com/en/support/technical-documentation.html

Adjustment of C-Mount

If for some reason the lens mount requires adjustment, use the following method.

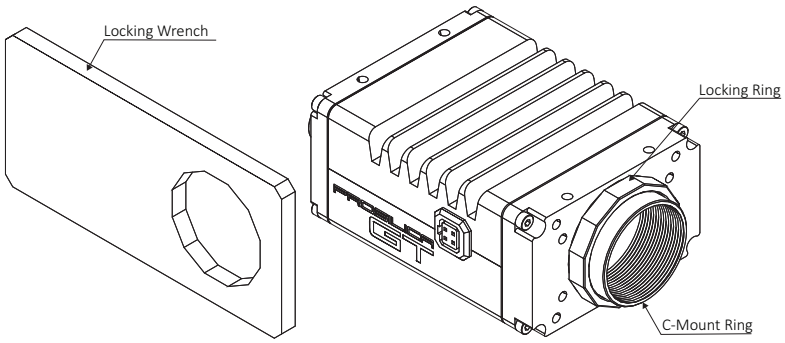


Figure 58: *Prosilica GT camera and locking wrench*

Loosen locking ring

Use an adjustable wrench to loosen the locking ring. Be careful not to scratch the camera. When the locking ring is loose, unthread the ring a few turns from the camera face.

Locking wrench

Contact the Allied Vision sales team to purchase the hexagonal lens adjustment wrench for Prosilica GT cameras with C/CS locking ring (order code 02-5003A).

Image to infinity

Use a C-Mount compatible lens that allows an infinity focus. Set the lens to infinity and image a distant object (10 to 15 m). Make sure the lens is firmly threaded onto the C-Mount ring. Rotate the lens and C-Mount ring until the image is focused. Carefully tighten the locking ring and recheck focus.

Lens protrusion for C-Mount cameras

Lens protrusion is the distance from outer edge of C-Mount ring to contact point of first surface internal to C-Mount ring. For color cameras this surface is the IR cut/pass filter holder, and for monochrome cameras this surface is the internal camera front plate. Table 54 presents lens protrusion values for Prosilica GT cameras with C-Mount.

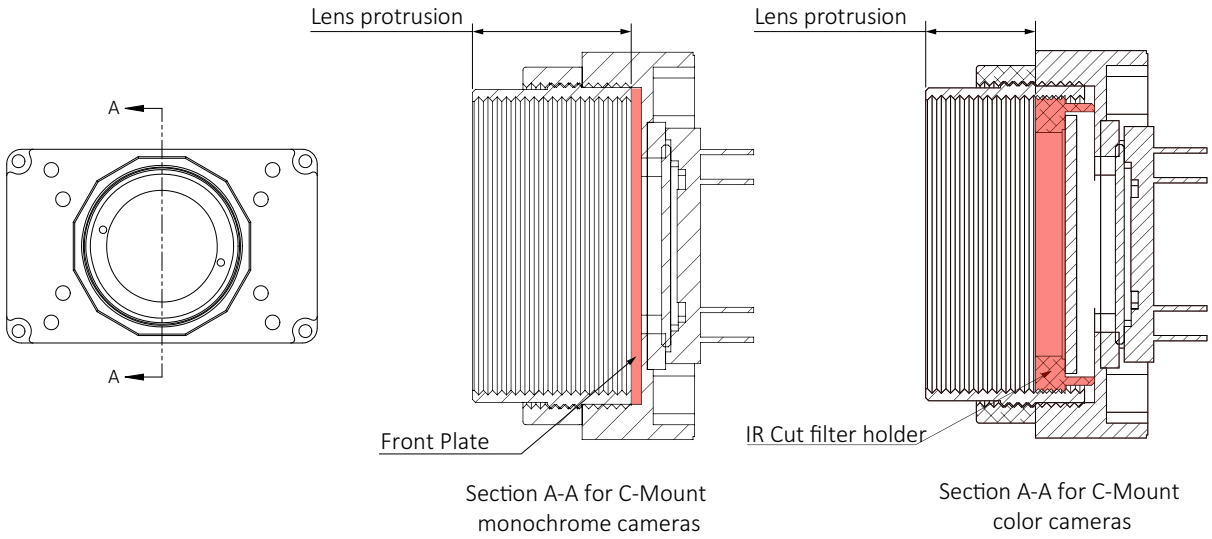


Figure 59: *Cross section of typical Prosilica GT camera front assembly with C-Mount*

Avoid damage from unsuitable lenses

To protect camera and lens, use lenses only up to the allowed maximum protrusion, as listed in the following tables.

Camera	Lens protrusion [mm]
GT1290	13.64
GT1290C	9.32
GT1380	13.64
GT1380C	9.64
GT1600	13.64
GT1600C	9.32
GT1660	13.64
GT1660C	9.43
GT1910	13.64
GT1910C	9.43

Camera	Lens protrusion [mm]
GT2000	13.64
GT2000C	10.31
GT2050	13.64
GT2050C	10.31
GT2300	13.64
GT2300C	9.43
GT2450	13.64
GT2450C	9.27
GT2750	13.64
GT2750C	9.27

Table 54: *Lens protrusion for Prosilica GT cameras with C-Mount*

Camera	Lens protrusion [mm]
GT1920	13.64
GT1920C	9.27
GT1930	14.52
GT1930C	9.44

Camera	Lens protrusion [mm]
GT3400	13.64
GT3400C	9.27

Table 54: *Lens protrusion for Prosilica GT cameras with C-Mount (continued)*

F-Mount

Flange focal distance is the optical distance from the mounting flange to image sensor die. Prosilica GT F-Mount cameras are calibrated to a standard 46.50 mm flange focal distance.

Adjustment of F-Mount

The F-Mount is adjusted at the factory and should not require adjusting. If for some reason the lens mount requires adjustment, use the following method.

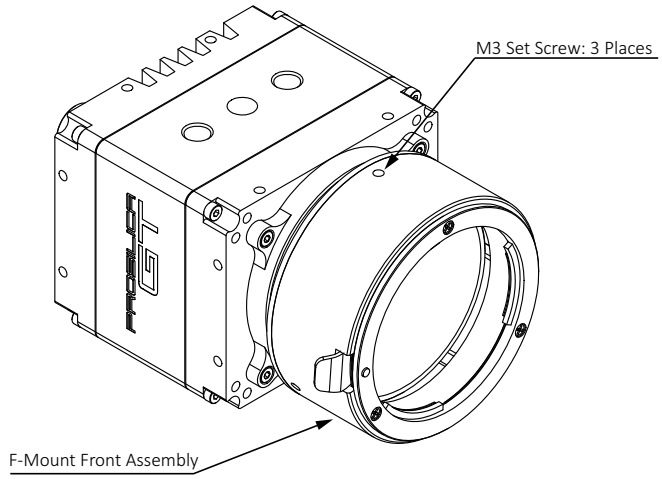


Figure 60: *Prosilica GT large format with F-Mount isometric view*

Adjusting the F-Mount

1. Attach F-Mount compatible lens
   Use an F-Mount compatible lens that allows an infinity focus. Attach the lens to the camera using a counter-clockwise rotation of about a quarter turn. The lens should snap into place and the lens flange and camera flange should mate over the full circumference.
2. Loosen F-Mount front assembly
   Use a 1.5 mm hex ball driver to loosen the 3 set screws then hold the F-Mount front assembly to the camera body.

3. Image to infinity
   Set the lens to infinity and image a distant object (10 to 15 m). Gently move the F-Mount front until focused and lock it in place.

Other mounts

Flange focal distance is the optical distance from the lens mounting flange to image sensor die.

Mount	Calibration variation	Flange focal distance
EF-Mount	< 70 µm (0.3°) Z-tilt and ±10 µm	44.00 mm
F-Mount	contact your Allied Vision sales team	46.50 mm
M42-Mount	contact your Allied Vision sales team	45.46 mm
M58-Mount	contact your Allied Vision sales team	12.71 mm 46.50 mm

Table 55: *Calibration variation from standard flange focal distance*

Planarity adjustment mounts

Prosilica GT cameras allow planarity adjustment of the mount relative to the camera sensor. Adjustment can be made for overall flange focal distance (Z distance), and planarity (Z-tilt). The following steps describe Z adjustment using a standard EF lens and a target. However, measurement tools such as an optical depth micrometer could also be used.

Modifying the factory default adjustment is under the responsibility of the user. Please exercise caution when modifying the planarity adjustment. Use a 1.5 mm hex ball driver to loosen the three spring loaded bolts, adjust the tilt adjustment screws as required, then secure the bolts.

1. Using an EF-Mount compatible lens, set the lens to infinity and image on a target (10 to 15 m). Target should highlight focus levels at center image and at the corners of the image, as shown in figure 61. A lens with a long focal length, or adjustable zoom lens, will allow more precision for this operation and reduce the overall size of your target.

2. Use a 1.5 mm hex ball head driver to loosen the bolts.
   Adjust the three tilt adjustment screws, as indicated in figure 61, until all targets are in focus.

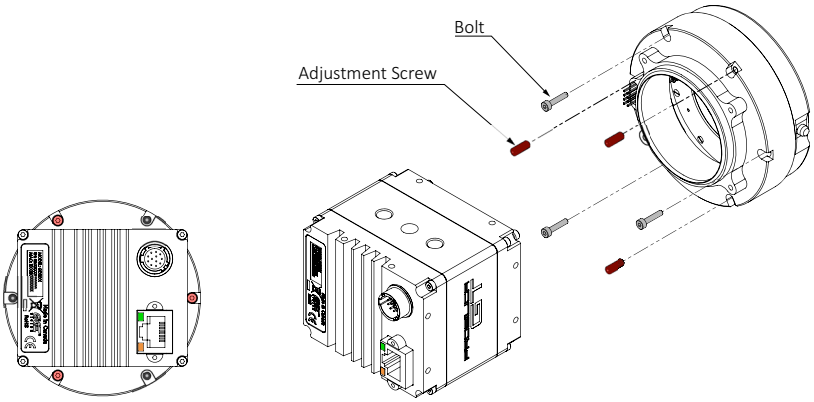


Figure 61: *Back view (left) and exploded view (right) of Prosilica GT1930L camera assembly showing the adjustment screws and bolts in the EF-Mount*

3. Tighten the three bolts and recheck the focus.

M42-Mount flange focal distance

M42-Mount PA (planarity adjustable)

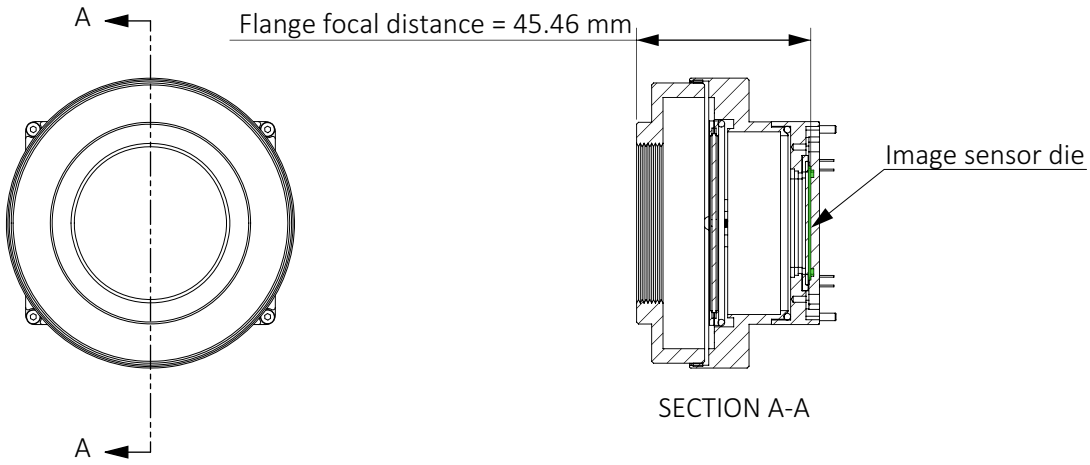


Figure 62: *M42-Mount PA flange focal distance*

M42-Mount

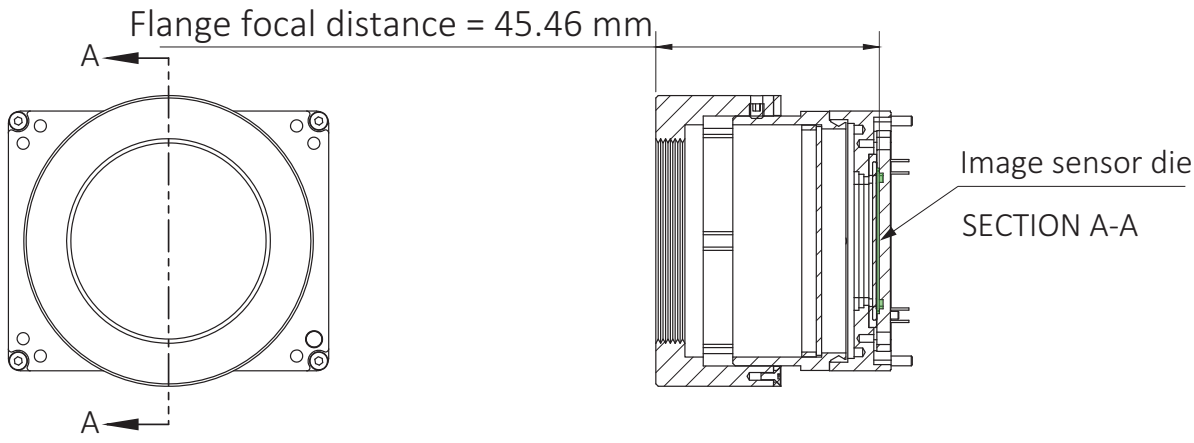
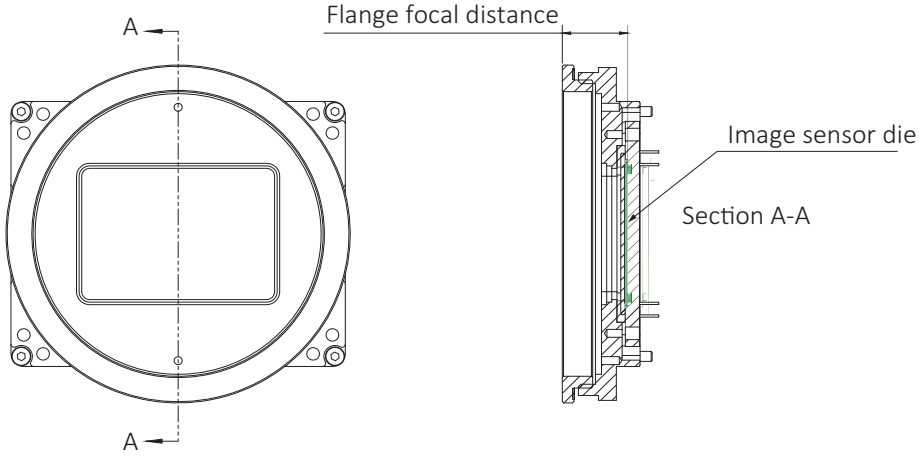


Figure 63: *M42-Mount flange focal distance*

M58-Mount flange focal distance

M58-Mount



Flange focal distance:
Monochrome cameras: [12.33 to 15.81 mm] adjustable, 12.71 mm nominal.
Color cameras: [11.54 to 15.81 mm] adjustable, 12.71 mm nominal.

Figure 64: *M58-Mount flange focal distance*

M58-Mount PA focal distance

The M58-Mount PA (planarity adjustable) flange focal distance is 46.50 mm.

Sensor position accuracy

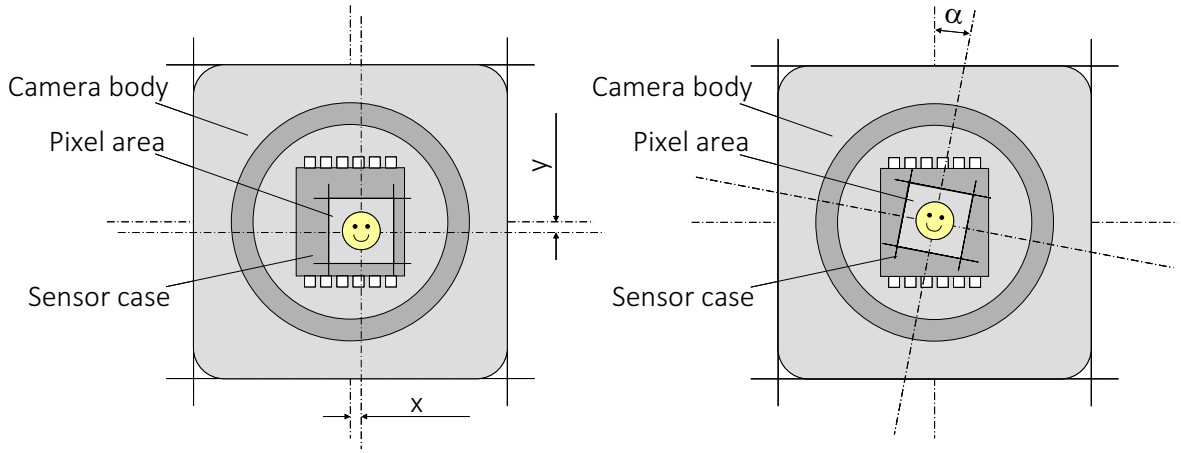


Figure 65: *Allied Vision sensor position accuracy*

Unless stated otherwise, the following values are applicable:

Criteria	Subject	Properties
Reference Point	Sensor	Center of pixel area (photo sensitive cells)
	Camera	Center of camera front flange (outer case edges)
Accuracy	x/y	±250 µm (sensor shift)
	z	±10 µm (optical back focal length)
	α	< 1° (sensor rotation)
Alignment		Optical alignment of photo sensitive sensor area into camera front module (lens mount front flange).

Table 56: *Sensor position accuracy criteria*

IR cut filter

All Prosilica GT color models are equipped with an infrared block filter (IR cut filter). This filter is employed to prevent infrared wavelength photons from passing to the sensor. In the absence of IR cut filter, images are dominated by red and incapable of being properly color balanced. Monochrome cameras do not employ an IR cut filter.

Figure 66 shows the filter transmission response for the IRC30 filter employed in the Prosilica GT cameras.

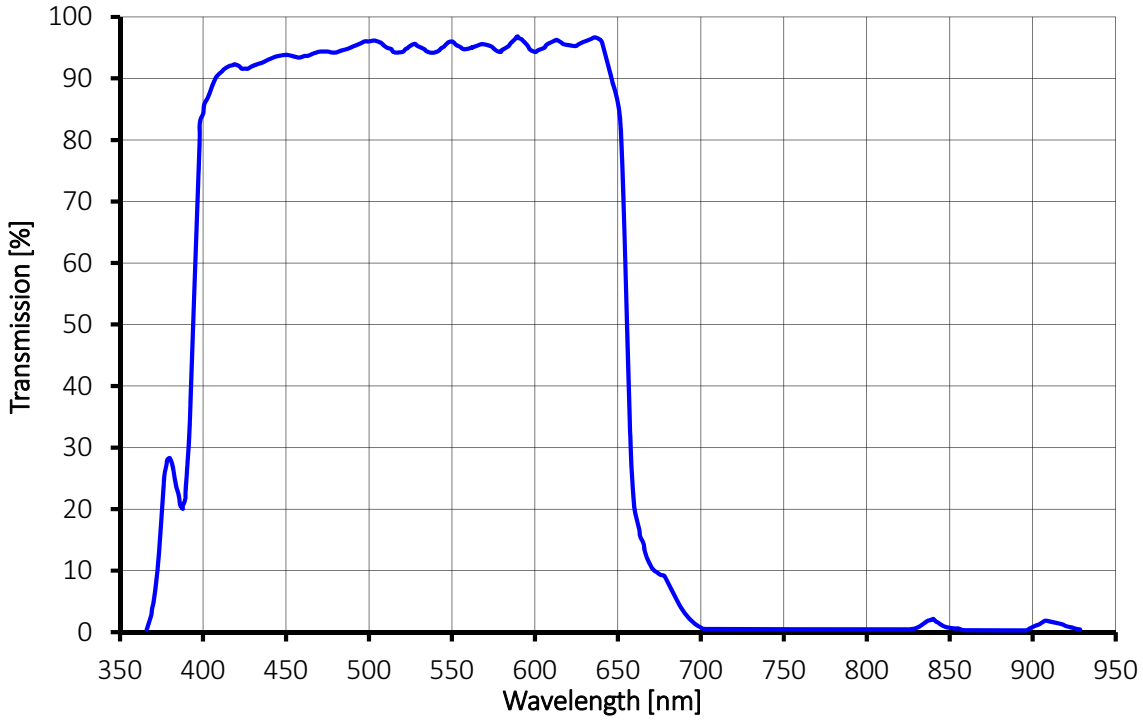
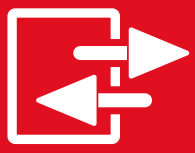


Figure 66: *IRC30 cut filter transmission response*

Camera interfaces



This chapter includes:

- A general description of the inputs and outputs (including trigger features)
- I/O connector pin assignments
- I/O block diagrams
- A general description of trigger rules such as timing diagram and definitions

Back panel

This chapter provides information on Gigabit Ethernet interface, inputs and outputs, and trigger features.

Accessories

Please contact your Allied Vision sales representative or your local Allied Vision distributor for information on accessories:

https://www.alliedvision.com/en/about-us/where-we-are.html

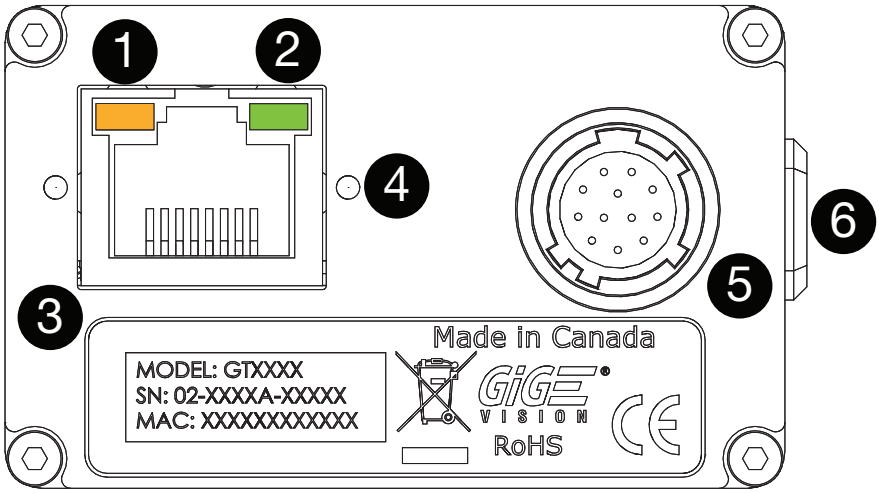


Figure 67: *Prosilica GT ports and interface*

1	LED 1
2	LED 2
3	Gigabit Ethernet Interface
4	Gigabit Ethernet cable mounting holes
5	Hirose I/O port
6	Auto iris port Large format cameras do not have an auto iris port.

Status LEDs

The color of the LEDs has the following meaning.

	LED Color	Status
LED1	Flashing/solid orange	Ethernet activity
LED2	Flashing green	Camera is powered
	Solid green	Camera is booted, and link with the host is established

Table 57: *Status of LEDs*

LED 2

Once the camera is booted, **LED2** remains solid green as long as the camera is powered, even if connection with the host is lost.

Gigabit Ethernet interface

The Prosilica GT is powered through the 12-pin Hirose I/O port, or the Gigabit Ethernet interface by using any standard Power over Ethernet (PoE) supported network card, switch, or injector. Allied Vision recommends using Category 6 or higher compatible cabling for best performance.

GigE Installation Manual

The *GigE Installation Manual* offers detailed instructions for using Prosilica GT cameras.

https://www.alliedvision.com/en/support/technical-documentation/prosilica-gt-documentation.html

Hardware Selection

See *Hardware Selection for Allied Vision GigE Cameras* application note for a list of recommended GigE host controller cards:

https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html

GigE host controllers

A standard PCI GigE host controller card is available for purchase from Allied Vision. Order code: 02-3002A (Intel Pro 1000/GT, PCI, 1 port).

A dual port PCI PoE GigE host controller card is available for purchase from Allied Vision. Order code: 2685 (Adlink GIE62+PCI ex4, 2 port).

Please contact the Allied Vision sales team for additional GigE host controllers.

Cable lengths

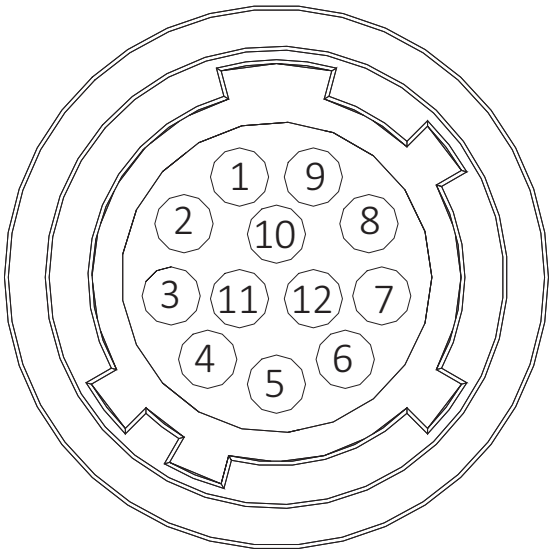
Cable lengths up to 100 m are supported. The 8-pin RJ-45 jack has the pin assignment according to the Ethernet standard (IEEE 802.3 1000BASE-T).

Horizontal locking screw connector

Prosilica GT cameras support cables with horizontal locking screw connector for a secured connection (see figure 67).

Allied Vision recommends using locking-screw cables from Components Express, Inc. for a perfect fit. Visit the CEI product configurator to customize the cable according to your needs.

Camera I/O connector pin assignment



Pin	Signal	Direction	Level	Description
1	Camera GND	In	GND for RS232 and external power	Ground for camera power supply, and RS232
2	Camera Power	In	7 to 25 VDC	Camera power supply
3	Out 4	Out	Open emitter maximum 20 mA	Opto-isolated Output 4 (SyncOut4)
4	In 1	In	LVTTL maximum 3.3 V	Non-isolated Input 1 (SyncIn1)

Table 58: *I/O connector pin assignment*

Pin	Signal	Direction	Level	Description
5	Out 3	Out	Open emitter maximum 20 mA	Opto-isolated Output 3 (SyncOut3)
6	Out 1	Out	3.3 V LVTTL maximum 50 µA	Non-isolated Output 1 (SyncOut1)
7	Isolated In GND	In	Common GND for In2	Isolated input signal ground
8	RxD RS232	In	RS232	Terminal receive data
9	TxD RS232	Out	RS232	Terminal transmit data
10	Isolated Out Power	In	Common VCC for outputs 5 to 24 VDC	Power input for opto-isolated outputs
11	In 2	In	U_{in}(high) = 5 to 24 V U_{in}(low) = 0 to 0.8 V	Input 2 opto-isolated (SyncIn2)
12	Out 2	Out	3.3 V LVTTL maximum 50 µA	Non-isolated Output 2 (SyncOut2)

Table 58: *I/O connector pin assignment (continued)*

The General Purpose I/O port uses a Hirose HR10A-10R-12PB connector on the camera side. The mating cable connector is Hirose HR10A-10P-12S.

Hirose connector

The cable side Hirose 12-pin female connector is available for purchase from Allied Vision. Order code: K7600040.

I/O definition

Camera Power

The Prosilica GT camera can be powered through the Hirose I/O port, via **Pin 1** Camera GND and **Pin 2** Camera Power, or through the Gigabit Ethernet interface if using a power over Ethernet (PoE) supported network card, switch, or injector.

Cameras powered by both the Hirose I/O port and the Gigabit Ethernet interface will use the power provided by Hirose I/O port only.

Pin 2, Camera Power, supports an input voltage range of 7 to 25 VDC. The camera will not power in reverse polarity. Exceeding the 25 V will damage the camera.

12 V power adapter

A 12 V power adapter with Hirose connector is available for purchase from Allied Vision:

- Order code: 02-8003D (Power supply, North America/Plug type B)
- Order code: 02-8004D (Power supply, Europe/Plug type F)

RxD RS232 and TxD RS232

These signals are RS232 compatible. These signals are not optically isolated. Tie RS232 ground to Camera GND to complete the RS232 circuit. Communication is at 11520 baud.

RS232

For complete RS232 description and usage, see the RS232 Port application note at:

https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html

Input triggers

Input triggers allow the camera to be synchronized to an external event. The camera can be programmed to trigger on the rising edge, falling edge, both edges, or level of the signal. The camera can also be programmed to capture an image at some programmable delay time after the trigger event.

In 1 (Non-isolated)

In 1 is not electrically isolated and can be used when environmental noise is insignificant and faster trigger response is required. The required trigger signal is low voltage TTL 3.3 V. Tie trigger ground to Camera GND to complete the trigger circuit.

Power caution

Exceeding 5.1 V on **In 1** can permanently damage the camera

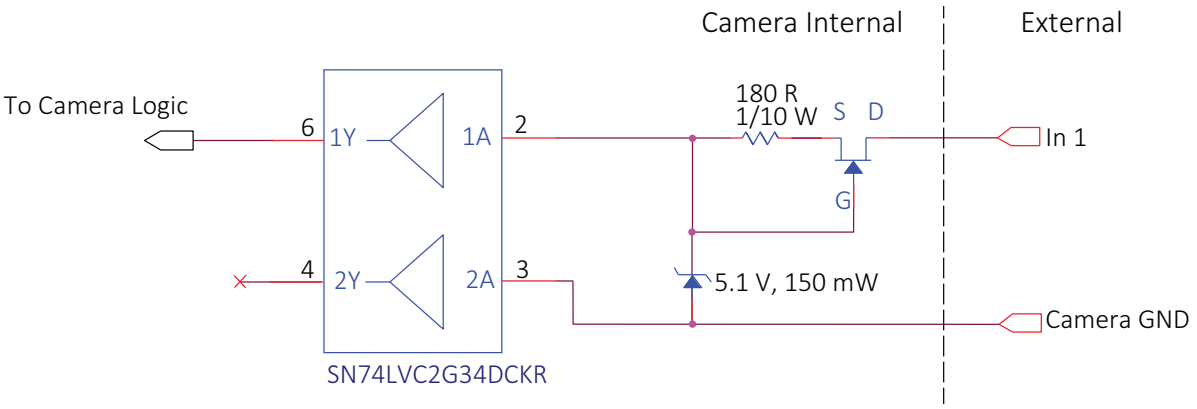


Figure 68: *Prosilica GT internal circuit diagram for non-isolated input trigger*

In 2 (Opto-isolated)

In 2 is optically isolated and can be used in electrically noisy environments to prevent false trigger events. Tie trigger ground to Isolated In GND to complete the trigger circuit. Compared to the non-isolated trigger, **In 2** has a longer propagation time. It can be driven from 5 to 24 V with a minimum current source of 5 mA.

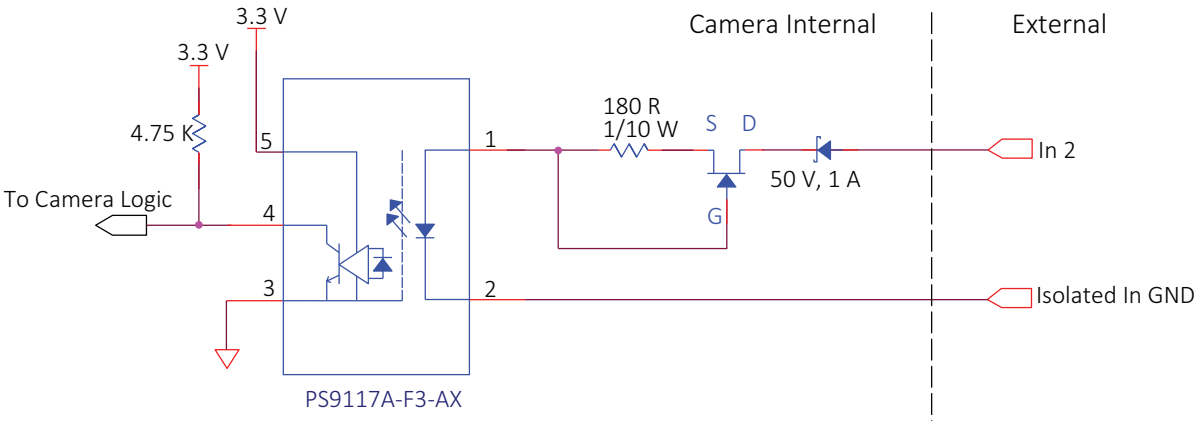


Figure 69: *Prosilica GT internal circuit diagram for opto-isolated input trigger*

Isolated In GND

The Isolated In GND connection provides the user ground reference and return path for **In 2**. It is recommended that the ground wiring be physically close to the **In2** wiring to prevent parasitic coupling. For example, a good cable design connects **In 2** to one conductor of a twisted pair, Isolated In GND to the second conductor of the same twisted pair.

Output signals

Output signals can be assigned to a variety of internal camera signals via software. They can be configured to active high or active low. The internal camera signals are listed as follows:

Exposing	Corresponds to when camera is integrating light.
Trigger Ready	Indicates when the camera is ready to accept a trigger signal.
Trigger Input	A relay of the trigger input signal used to “daisy chain” the trigger signal for multiple cameras.
Readout	Valid when camera is reading out data.
Imaging	Valid when camera is exposing or reading out.
Strobe	Programmable pulse based on one of the above events.
GPO	User programmable binary output.

Isolated Out Power

The Isolated Out Power connection provides power for isolated signals **Out 3** and **Out 4**. The voltage requirement is 5 to 24 VDC. The current requirement for this supply is a function of the optical isolator collector current and the number of outputs used in the system. Isolated Out Power wiring should be physically close to **Out 3** / **Out 4** wiring to prevent parasitic coupling.

Out 1 and 2 (Non-isolated)

Out 1 and **Out 2** signals are not electrically isolated and can be used when environmental electrical noise is insignificant and faster trigger response is required. Tie signal ground to Camera GND to complete the external circuit. The output signal is a low voltage TTL, maximum 3.3 V. It is not suitable for driving loads in excess of 50 µA.

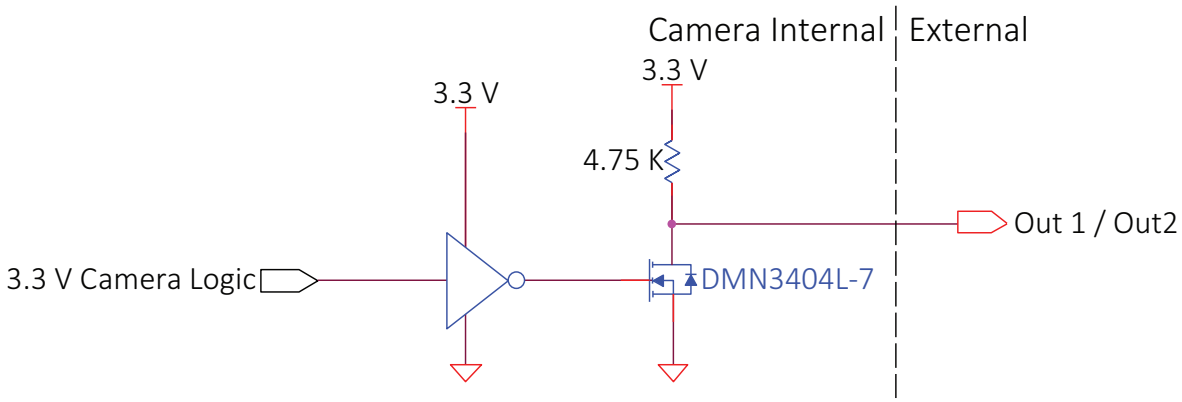


Figure 70: *Prosilica GT Out 1 / Out 2 trigger circuit*

Out 3 and 4 (Opto-isolated)

Note on 4.75 KΩ resistors

Prosilica GT Technical Manual V2.1.1, V2.2.0, and V2.3.0 presented two 4.75 KΩ internal pull-down resistors in the opto-isolated output trigger circuit. In July 2012, these 4.75 KΩ resistors were removed from the printed circuit board assembly.

Regardless of whether your Prosilica GT camera has the two 4.75 KΩ internal pull-down resistors or not, please implement the output trigger (Out3 and Out4) as described below.

Out 3 and **Out 4** signals are optically isolated and require the user to provide a voltage level, Isolated Out Power. The **Out3/4** signal should be grounded by adding an external load resistor as shown in figure 71 and table 59. Isolated Out Power can be configured between 5 to 24 V.

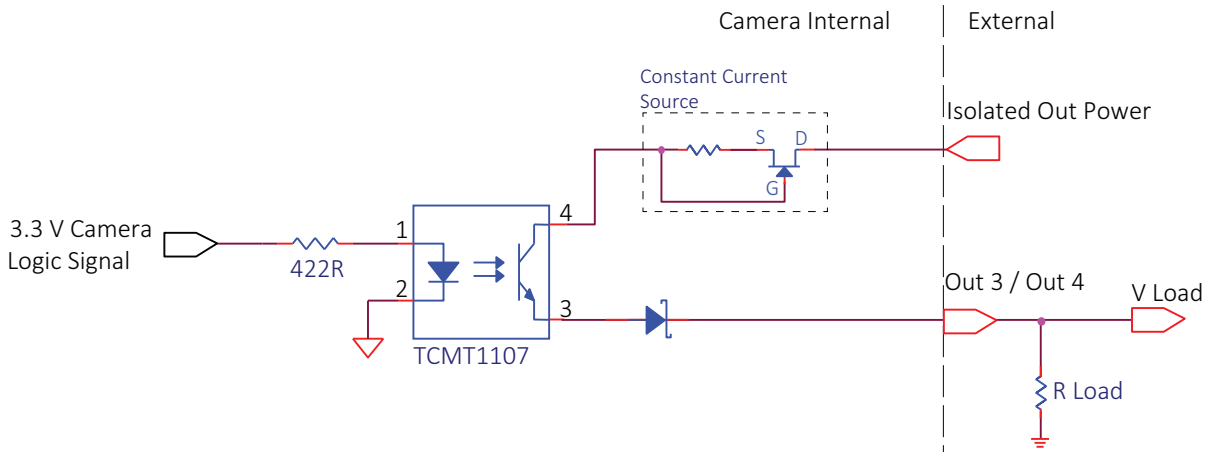


Figure 71: *Prosilica GT Out 3 / Out 4 trigger circuit*

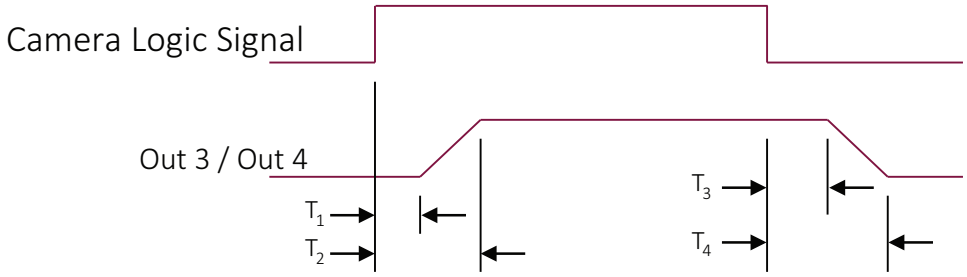


Figure 72: *Prosilica GT Out 3 / Out 4 timing diagram*

The influence of various Isolated Out Power values and load values on the timing response of the trigger is indicated in table 59. Trigger current, Out ICC, is a function of Isolated Out Power voltage and Load resistor R.

Isolated Out Power	OUT ICC	R Load	V Load	R Power Dissipation	T_1	T_2	T_3	T_4
5 V	0.8 mA	500 Ω	4.2 V	3.5 mW	1.2 µs	5.4 µs	5.6 µs	64 µs
5 V	1.7 mA	2.4 KΩ	4.0 V	6.7 mW	1.2 µs	5.4 µs	4.4 µs	34 µs
12 V	2.1 mA	5 KΩ	10.4 V	21.6 mW	1.2 µs	10 µs	4.0 µs	47 µs
24 V	1.8 mA	10 KΩ	18.4 V	33.9 mW	1.2 µs	15 µs	3.4 µs	70 µs

Table 59: *Prosilica GT trigger circuit values*

Lens control

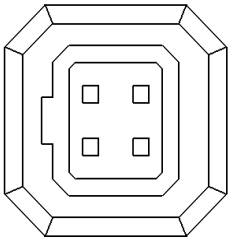
Prosilica GT standard and extended cameras

Lens support

Video-type auto iris lenses are not supported.
Motorized CCTV lenses are not supported.

Read lens descriptions carefully before purchasing or contact your Allied Vision sales representative.

For example, a motorized iris lens may be a bipolar single axis motorized lens, and not a DC auto iris or P-Iris lens



Prosilica GT cameras with standard and extended housings can be used with C-Mount and CS-Mount auto iris lenses of DC type and P-Iris type.

Both DC and P-Iris lens types use the same standard connector, shown left, located on the side of the camera. Lens type is automatically determined by the camera on power-up. Connecting the lens after the camera is powered will not damage the lens, but it will not be recognized by the camera; therefore, the relevant camera control attributes will not function. If this occurs, disconnect and reconnect the camera power supply.

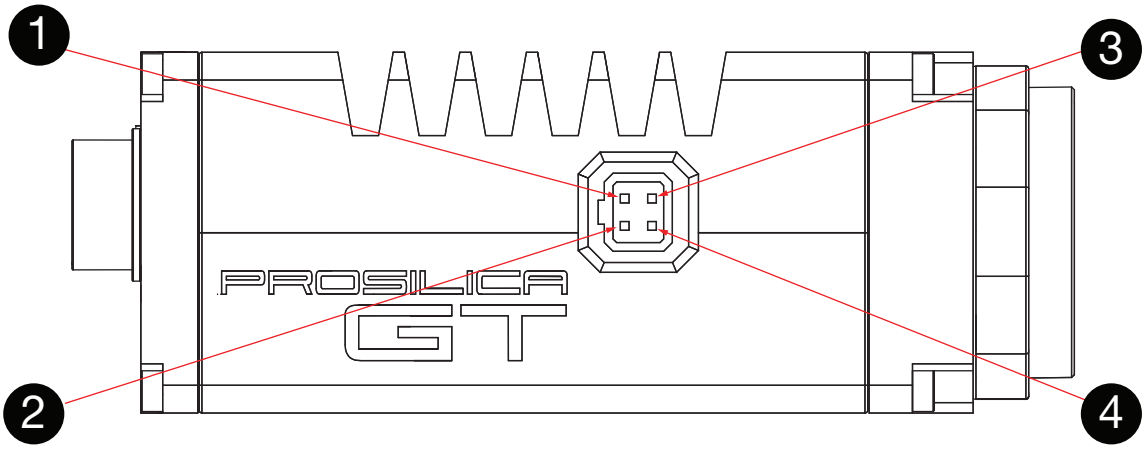


Figure 73: *Prosilica GT lens control port*

DC AutoIris Mode			
PIN Number	**PIN Function**	**Voltage**	**Maximum Current**
1	Damp – (input)	N/A	N/A
2	Damp + (input)	N/A	N/A
3	Drive + (output)	3.3 V	50 mA
4	Drive – (output)	0 to 3.3 V	50 mA

Table 60: *DC AutoIris mode lens control port wiring*

P-Iris Mode			
PIN Number	**PIN Function**	**Voltage**	**Maximum Current**
1	Coil 1 A (output)	0 V or 3.3 V	200 mA
2	Coil 2 A (output)	0 V or 3.3 V	200 mA
3	Coil 2 B (output)	0 V or 3.3 V	200 mA
4	Coil 1 B (output)	0 V or 3.3 V	200 mA

Table 61: *P-Iris mode lens control port wiring*

DC-Iris lenses

The Prosilica GT cameras with standard and extended housings operate with any standard DC-type auto iris lens. Allied Vision tested lenses include Fujinon DV10x8SA-SA1L, Computar HG2Z0414FC-MP, and Pentax C61227DCPS.

DC-type auto iris lenses are continuously driven by a voltage (0 to 3.3 V) from the camera lens control port. This voltage level determines whether the lens opens or closes, and is calculated based on the applicable iris camera attributes.

Operation

1. Connect a DC-Iris lens to the camera before powering up the camera.
2. Power up the camera, and open the camera control software.
3. Set the camera to live image with desired `ExposureValue` and `GainValue` attributes.
4. Set `IrisMode` = `DCIris`. The camera uses an automatic algorithm to determine correct lens iris position based on the `IrisVideoLevel` attribute.
5. If lens operation is too slow or oscillates, see `LensDCDriveStrength`.

DC-Iris controls

DC-Iris controls are described further in the following documents:

- Vimba and third-party software users: GigE Features Reference
- PvAPI users: GigE Camera and Driver Attributes document

P-Iris lenses

P-Iris (Precise iris) lenses allow the camera to adjust to an exact F-number without drift, through the usage of a stepper motor. The host system knows the exact position of the iris at all times, allowing for a closed loop feedback system.

Operation

1. Connect a P-Iris lens to the camera before powering up the camera.
2. Power up the camera, and open the camera control software.
3. Set the camera to live image with desired `ExposureValue` and `GainValue` attributes.
4. Set `LensPIrisFrequency` as specified by lens documentation, or in supported the P-Iris lens list, as described in the next section. All P-Iris lenses tested thus far operate well between [100 to 200].
5. Set `LensPIrisNumSteps` as specified by lens documentation, or in the supported P-Iris lens list, as described in the next section.
6. Set the `IrisMode` attribute to `PIrisAuto` or `PIrisManual`. `PIrisAuto` uses an automatic algorithm to determine the correct `LensPIrisPosition` based on the `IrisVideoLevel` attribute. `PirisManual` allows manual control of `LensPIrisPosition`.

P-Iris controls

P-Iris controls are described further in the following documents:

- Vimba and third-party software users: GigE Features Reference
- PvAPI users: GigE Camera and Driver Attributes document

P-Iris supported lenses

For a list of P-Iris supported lenses, along with their `LensPIrisFrequency` and `LensPIrisNumSteps` specifications, see the P-Iris Lens application note:

https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html

Prosilica GT large format cameras

Electro-Focus (EF) lens control is available on the Prosilica GT1930L, GT4905, GT4907, and GT6600 cameras. EF lens control allows focus and aperture control via host software.

Lens mount options

See Modular Concept for information on lens mount options available with Prosilica GT large format cameras:

https://www.alliedvision.com/en/support/technical-documentation/prosilica-gt-documentation.html

Operation

1. Connect an EF lens to the camera before powering up the camera.
2. Power up the camera, and open the camera control software.

Maximum power via PoE

The maximum power supplied via PoE is 13 W. EF lens power requirements will vary from lens to lens; however, typical ratings are in the 3 to 4 W range.

Should your lens plus camera power requirements exceed 13 W, it will be necessary to power the camera via Hirose I/O port.

3. Use `EFLensInitialize` command to initialize the EF lens. This command is automatically executed on power up and/or when lens is attached to camera.
4. Adjust the focus and aperture using `EFLensFocus` and `EFLensFStop` controls, respectively.
5. If the lens does not operate as expected, see `EFLensState` and `EFLensLastError`.

EF lens controls

EF lens controls are described further in the `EFLensControl` section of following documents:

- Vimba and third-party software users: GigE Features Reference
- PvAPI users: GigE Camera and Driver Attributes document

Camera trigger

Trigger timing diagram

The following diagram explains the general trigger concept.

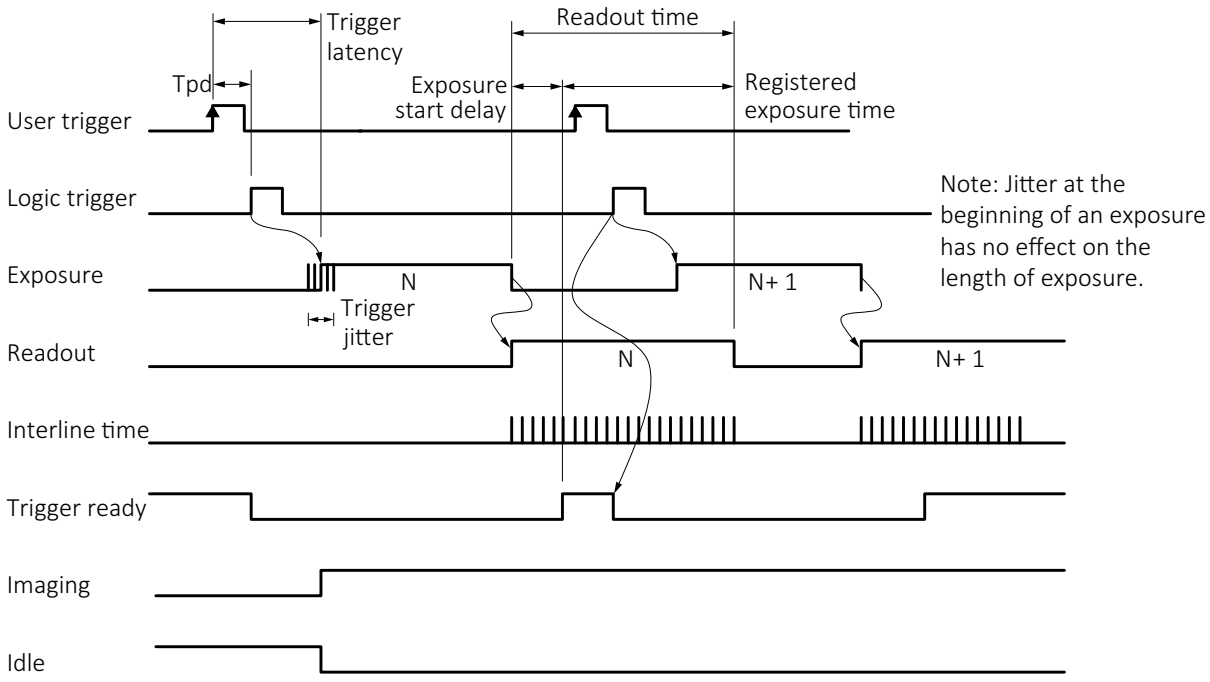


Figure 74: *Prosilica GT internal signal timing waveforms*

Trigger definitions

Term	Definition
User trigger	Trigger signal applied by the user (hardware trigger, software trigger).
Logic trigger	Trigger signal seen by the camera internal logic (not visible to the user).
Tpd	Propagation delay (t_{pd}) between the user trigger and the logic trigger.
Exposure	High when the camera image sensor is integrating light.
Readout	High when the camera image sensor is reading out data.
Trigger latency	Time delay between the user trigger and the start of exposure.
Trigger jitter	Deviation from the trigger latency time.
Trigger ready	Indicates to the user that the camera will accept the next trigger.
Registered exposure time	Exposure time value currently stored in the camera memory.
Exposure start delay	Registered exposure time subtracted from the readout time and indicates when the next exposure cycle can begin such that the exposure will end after the current readout.
Interline time	Time between sensor row readout cycles.
Imaging	High when the camera image sensor is either exposing and/or reading out data.
Idle	High if the camera image sensor is not exposing and/or reading out data.

Table 62: *Explanation of signals in timing diagram*

Trigger rules

The user trigger pulse width should be at least three times the width of the trigger latency as indicated in Specifications on page 24.

- The end of exposure will always trigger the next Readout.
- The end of exposure must always end after the current Readout.
- The start of exposure must always correspond with the Interline Time if Readout is true.
- Exposure start delay equals the readout time minus the registered Exposure Time.

Triggering during the idle state

For applications requiring the shortest possible *Trigger Latency* and the smallest possible *Trigger Jitter* the *User Trigger* signal should be applied when *Imaging* is false and *Idle* is true. In this case, *Trigger Latency* and *Trigger Jitter* are as indicated in Specifications on page 24.

Triggering during the readout state

For applications requiring the fastest triggering cycle time whereby the camera image sensor is exposing and reading out simultaneously, apply the *User Trigger* signal as soon as a valid *Trigger Ready* is detected. In this case, *Trigger Latency* and *Trigger Jitter* can be up to 1 row time since *Exposure* must always begin on an *Interline* boundary.

For a more detailed description of the trigger concept for advanced users and special scenarios, see the Triggering Concept application note:

https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html

Image data flow

This chapter presents diagrams that illustrate data flow and bit resolution of the image data.

Camera control documents

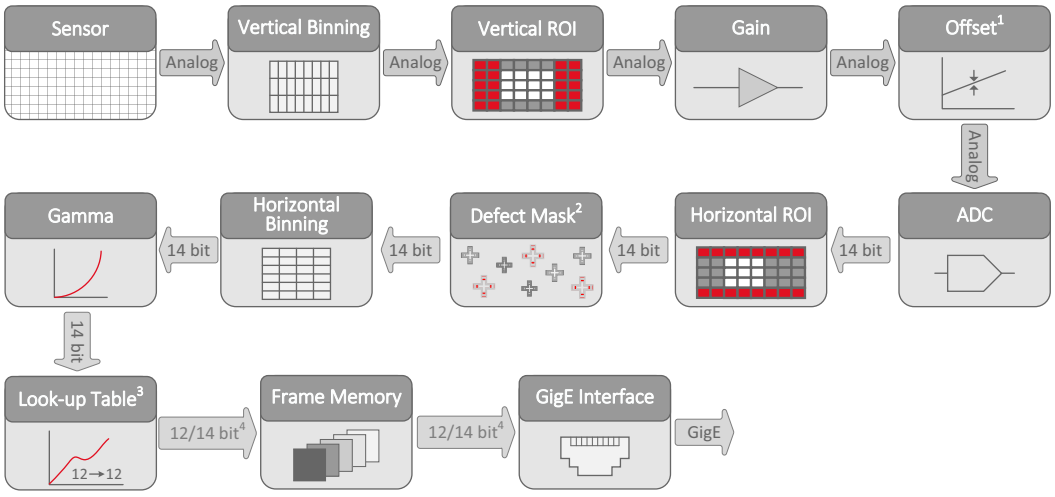
A complete description of individual blocks can be found online:

- Vimba and third-party users: GigE Features Reference
- PvAPI users: GigE Camera and Driver Attributes document

Prosilica GT monochrome cameras

Prosilica GT cameras with CCD sensors

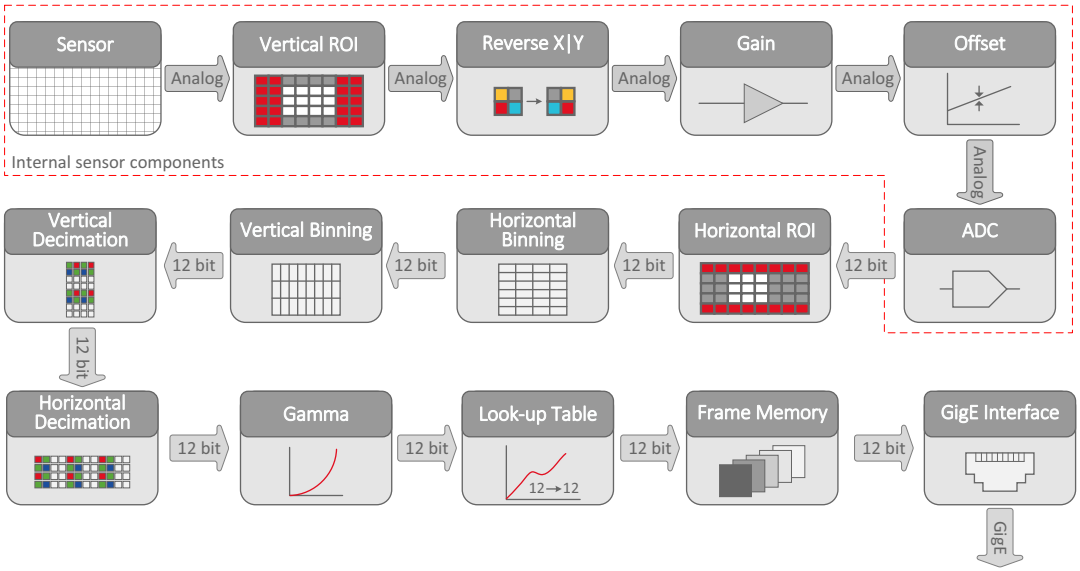
GT1290, GT1380, GT1600, GT1660, GT1910, GT1920, GT2300, GT2450, GT2750, GT3300, GT3400, GT4905, GT4907, GT6600



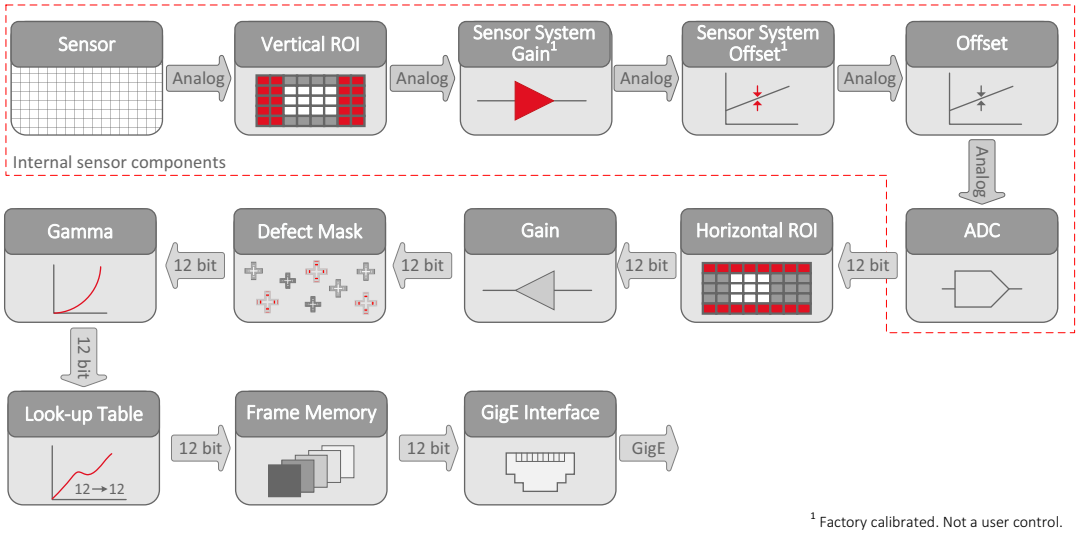
[1] Factory calibrated. Not a user control.
[2] Column defect masking is only available for GT3400, GT4905, GT4907, and GT6600.
[3] LUTs are only available for GT1290, GT1380, GT3400, GT4905, GT4907, and GT6600.
[4] 12 bits with LUT, 14 bits if the LUT is bypassed

Prosilica GT cameras with CMOS sensor

GT1930, GT1930L



GT2000, GT2000NIR, GT2050, GT2050NIR

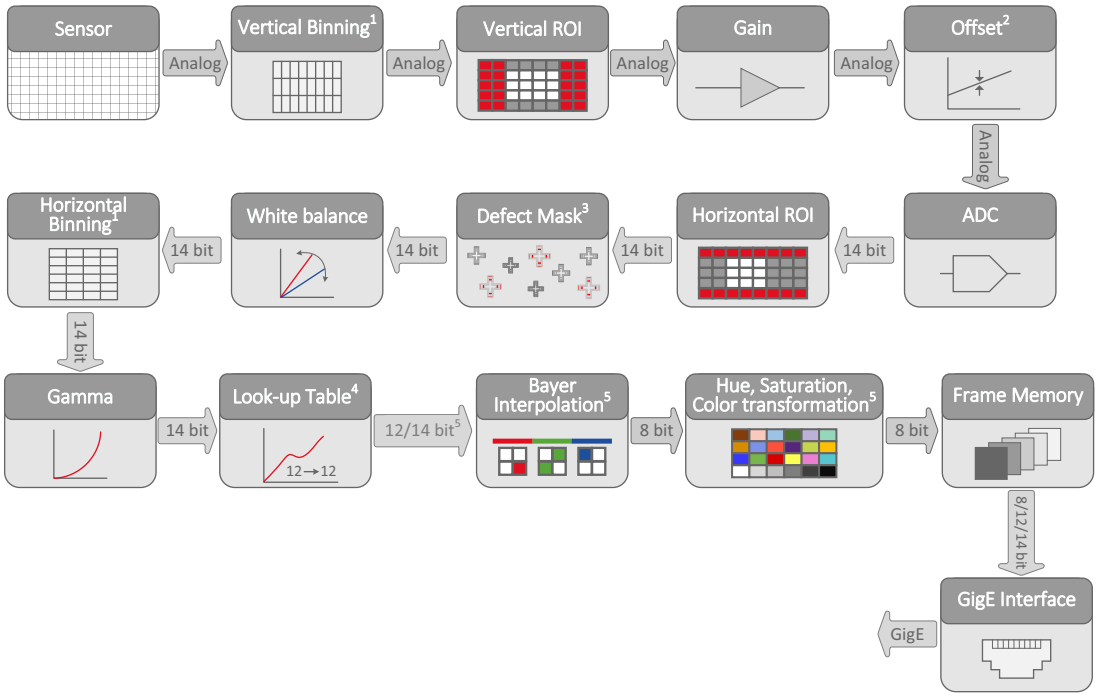


[1] Factory calibrated. Not a user control.

Prosilica GT color cameras

Prosilica GT cameras with CCD sensors

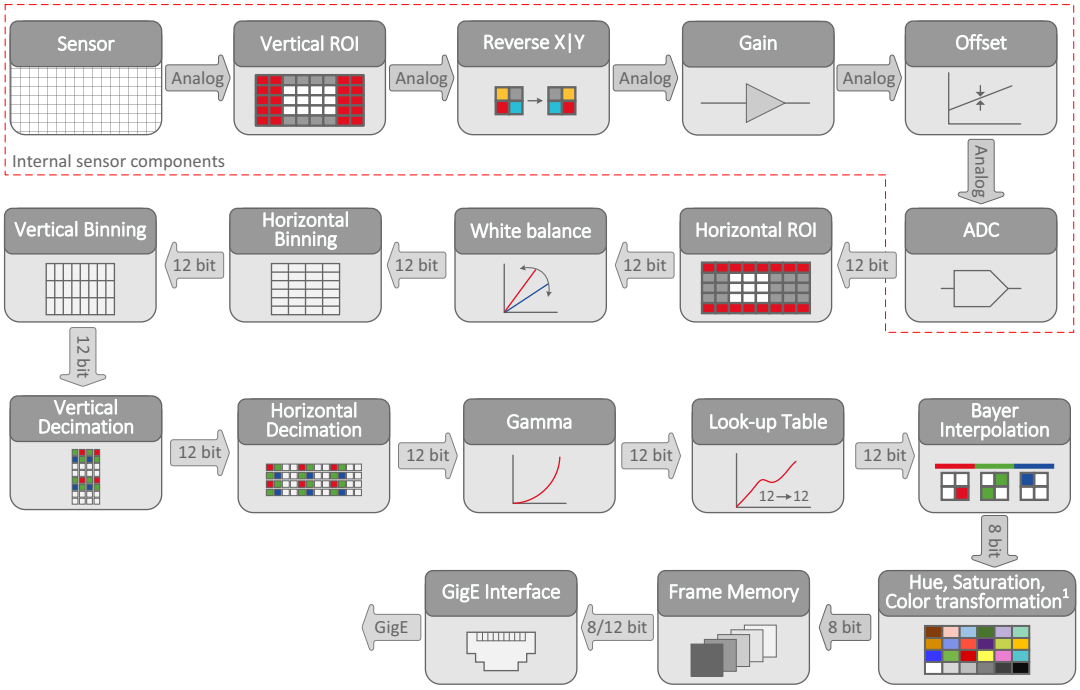
GT1290C, GT1380C, GT1600C, GT1660C, GT1910C, GT1920C, GT2300C, GT2450C, GT2750C, GT3300C, GT3400C, GT4905C, GT4907C, GT6600C



[1] Color information is lost while binning is active.
[2] Factory calibrated. Not a user control.
[3] Column defect masking is only available for GT3400C, GT4905C, GT4907C, and GT6600C.
[4] LUTs are only available for GT1290C, GT1380C, GT3400C, GT4905C, GT4907C, and GT6600C.
[5] 12 bits with LUT, 14 bits if the LUT is bypassed.
[6] For on-camera interpolated *PixelFormats* only (8-bit output). Raw un-interpolated *PixelFormats* skip this block (8/12 bit output), depending upon the bit depth of *PixelFormat* used.

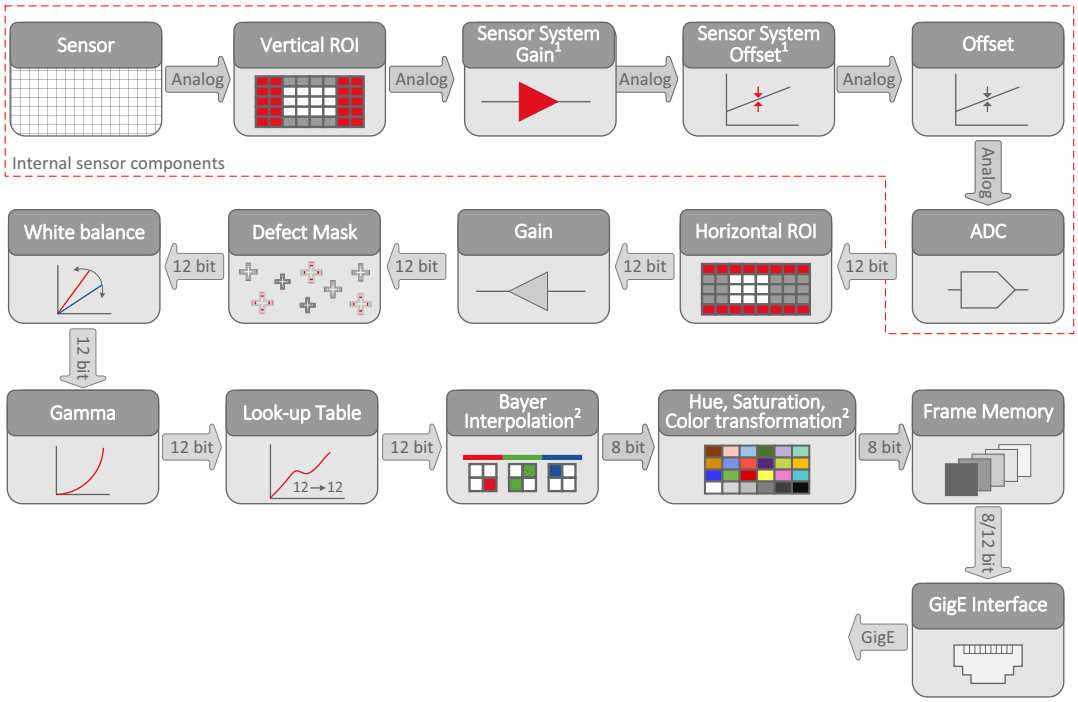
Prosilica GT cameras with CMOS sensors

GT1930C, GT1930LC



[1] For on-camera interpolated *PixelFormats* only (8-bit output). Raw un-interpolated *PixelFormats* skip this block (8/12 bit output), depending upon the bit depth of *PixelFormat* used.

GT2000C, GT2050C



[1] Factory calibrated. Not a user control.
[2] For on-camera interpolated *PixelFormats* only (8-bit output). Raw un-interpolated *PixelFormats* skip this block (8/12 bit output), depending upon the bit depth of *PixelFormat* used.

Cleaning optical components

This chapter describes safety instructions and cautions for cleaning lenses, optical filters, protection glass, or sensors.

Please read these instructions before you contact Allied Vision or your Allied Vision camera distributor for assistance.

Contact Allied Vision or your Allied Vision camera distributor if you are not familiar with the procedures described below.

Warranty

For details about camera warranty duration and sensor warranty terms, go to:

https://www.alliedvision.com/en/support/warranty

To ensure your warranty remains in effect:

- Do not open the camera housing.
- Follow instructions described below.
- Use only optical quality tissue/cloth if you must clean a lens or filter.
- Use only optics cleaner. Do not use aggressive cleaners like benzine or spirit. Such cleaners may destroy the optical component's surface.
- Do not use compressed air which can push dust into camera and lens.

Allied Vision does not warranty against any physical damage to the sensor, filter, protection glass, or lenses. Use utmost care when cleaning optical components.

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Keep optical components clean

The best way to ensure the camera remains clean is to avoid penetration of foreign substances into the camera.

When screwing/unscrewing the camera lens or dust cap, hold the camera with the mount opening towards the floor. This minimizes the possibility of any contaminants falling on the glass surface. Always store cameras and lenses with dust-caps on.

Identifying impurities

If you observe any image artifacts in your video preview of your Prosilica GT camera you may have impurities either on the lens, filter/protection glass, or on the sensor protection glass. Every Prosilica GT camera is cleaned prior to sealing and shipment; however, impurities may develop due to handling or unclean environments.

As shown in figure 75, impurities (dust, particles or fluids) on the sensor or optical components appear as a dark area, patch or spot on the image and remain fixed in the preview window while you rotate the camera over the target.

Do not confuse this with a pixel defect which appears as a distinct point. Particles can either rest loosely or can be more or less stuck to the optical surface.

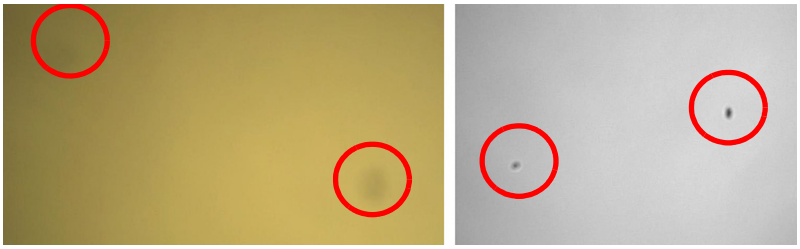


Figure 75: *Image with tiny dust on the filter (left) and dust on the sensor (right)*

Locating impurities

Before you dismount the lens you should find out if the impurity is on the filter, lens, or sensor.

1. Start acquiring a uniform image (e.g., a white sheet of paper) with the camera.
2. To identify the affected surface, move the suspected optical component and see if the contamination follows this movement.
    a. If you move only the lens (not the camera) and the impurity moves as well, the impurity is on the lens.
    b. If you move the IR cut filter/protection glass window and the impurity moves as well, the impurity is on the filter/protection glass. Carefully remove the filter/protection glass and clean it on both sides using the techniques explained in the next section. If the impurity is neither on the lens nor the IR cut filter/protection glass, it is probably on the sensor.

Removing IR cut filter

A pin spanner wrench (Allied Vision order code: 02-5003A) suitable for IR filter removal is available for purchase from Allied Vision for all Prosilica GT cameras except Prosilica GT large format cameras.

Do not attempt to remove the camera IR filter for Prosilica GT large format cameras. Please contact support@alliedvision.com for assistance.

Materials for cleaning optical components

Use only these cleaning materials for optical components

- Optic approved lens cotton, cloth, or tissue that is chemically pure and free from silicones and other additives.
- Optic approved low residue cleaning liquid.

Never use these cleaning materials for optical components

- Dry swabs or tissue may cause scratches.
- Metal tools may cause scratches.
- Disposable cotton cosmetic swabs may contain contaminants harmful to optical glass.
- Cosmetic cotton my cause scratches or get caught in small gaps.
- Consumer eyeglass cleaning cloths may be pretreated with silicone harmful to optical glass.
- Aggressive cleaners like benzine, acetone, or spirits may damage the surface.

Cleaning Instructions

Workplace conditions

- Perform all cleaning operations (lenses, filter/protection glass, and sensor) in a dust-free clean-room.
- Avoid touching the optical components with your fingers or any hard material.
- Nitrile cleanroom gloves or powder free latex gloves are recommended to maintain low particulate levels.
- Use an ESD mat to prevent damage from an electrostatic discharge.

1. Unplug the camera from any power supply before cleaning.
2. Apply a small amount of cleaning liquid to a new lens cleaning cotton, cloth, or tissue. The cotton, cloth, or lens tissue should be moist, but not dripping.

3. Hold the camera sensor diagonally upwards. Ensure that the camera is away from your body to prevent particles like skin flakes from falling on the sensor.
4. Wipe the glass surface with a spiral motion from the center to the rim. Normally, several spiral wipes are recommended. Wipe only on glass avoiding contact to metal surfaces, because microscopic dirt could be released and could cause scratches on the glass.
5. When you have finished cleaning, examine the surface in a strong light. Take an out-of-focus picture of a flat, illuminated surface to see if any dirt or dust remains.
6. If dust spots remain, repeat this procedure using new clean lens tissue (as described above).

Cleaning issues

If you notice that the camera lens or sensor is not clean after attempting to clean twice, or if you have any questions regarding cleaning your camera, please contact your Allied Vision distributor.

Cleaning with compressed air

Allied Vision does not recommend cleaning Prosilica GT cameras with compressed air.

- Compressed air at high pressure and/or shorter operating distances may push dust into the camera/lens and physically damage the camera, sensor, or optical components.
- Propellant from non-optic approved compressed air products may leave a residue on the camera or lens and may physically damage the camera, sensor, or optical components.
- Compressed air may contain oil or moisture that could contaminate or damage the optical components.
- Use an air blower/compressed air only if you are familiar with cleaning a camera using this method.

If you want to clean your camera with compressed air despite of all the warnings:

- Use an optic approved compressed air product or compressor.
- Use an anti-static ionizer attachment to reduce the risk of static-caused damage.
- Use a filter to remove moisture and oil from the air.
- Use short directed bursts of air to remove impurities.

Compressed air pressure and operating distance

- Keep the compressed air pressure at a moderate strength only. Pressure at the nozzle should be less than 1 bar (15 psi).
- Operating distance from the camera should be 5 to 30 cm.

Firmware update

This chapter includes instructions on updating the firmware on your Allied Vision Prosilica GT camera.

Download the latest GigE firmware loader from the Allied Vision website:

https://www.alliedvision.com/en/support/firmware

Saved camera user sets

If new firmware contains a new feature/control, saved camera UserSets/ ConfigFiles will be invalidated and erased!

Before loading new firmware, backup your current camera settings.

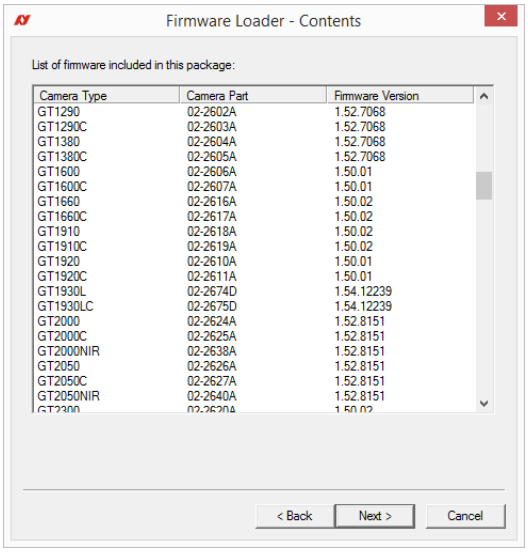
GigE SampleViewer: select the **Disk** icon from the **Cameras** window to export camera settings file (XML) to the host PC.

Vimba Viewer: select the **Save Camera Settings** icon from the **Cameras** window to export the camera settings file (XML) to the host PC.

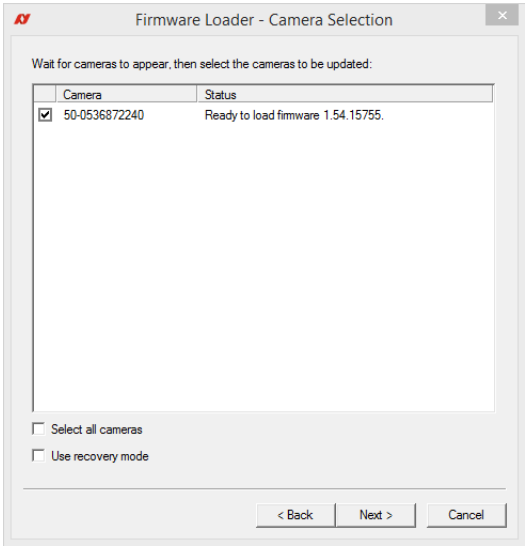
To update the firmware on your Allied Vision GigE camera

1. Launch the Allied Vision Firmware Loader.

2. Click **Next**. The Firmware Loader displays a list of firmware included in the package.



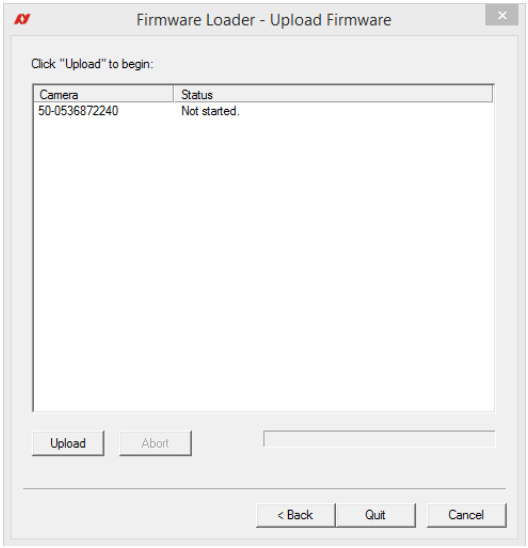
3. Click **Next**. You can select your camera model on this page.



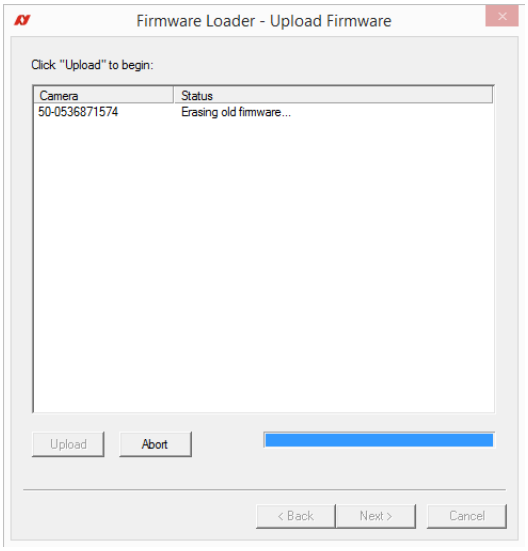
Recovery Mode

Select the **Use recovery mode** check box if the connected GigE camera is not found by the firmware loaded, or if the GigE camera is listed as unavailable. When selected, power cycle the camera to enter the Boot Loader mode.

4. Click **Next**.

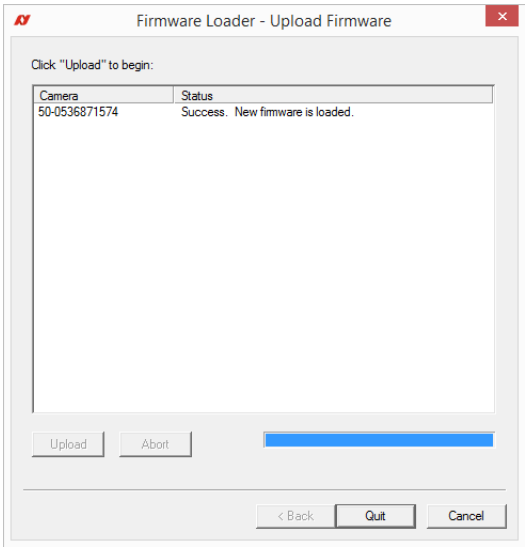


5. Click **Upload** to start the update. The existing firmware will be erased and the new firmware will be updated to the camera.



Do not unplug the GigE cable or camera power supply during the update procedure.

6. The Firmware Loader will display a success status upon completion. Click **Quit** to exit the loader.



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