

GIGE VISION CAMERAS

# Prosilica GT

# Technical Manual

V3.2.2

**Quick links**

- [Prosilica GT cameras at a glance](#) on page 14
- [Contact us](#) on page 16
- [Contents](#) on page 17

# Read before use

## EN - English

### Safety

Before using the camera, read these safety instructions. Observe the warnings at all times. Use the camera only as stated in the [Intended use](#) on page 36.

**CAUTION****Risk of burns**

A camera in operation can reach temperature levels which could cause burns.

**CAUTION****Injury by falling cameras or lenses**

A falling camera or lens can cause injury.

**CAUTION****Risk of cuts by sharp edges of lens mounts**

The threads of the lens mount can have sharp edges.

### Intended use

Intended use of Allied Vision product is the integration into vision systems by professionals. All Allied Vision product is sold in a B2B setting.

## DA - Dansk

### Sikkerhed

Læs sikkerhedsanvisningerne, før kameraet bruges. Overhold alle advarsler. Brug kun kameraet som anført i [Intended use](#) på side 36.



#### FORSIGTIG

##### **Forbrændingsfare**

Når kameraet bruges, kan det blive meget varmt og forårsage forbrændinger.



#### FORSIGTIG

##### **Kvæstelser, hvis kameraet eller linser falder ned**

Falder kameraet eller linsen ned, kan dette forårsage kvæstelser.



#### FORSIGTIG

##### **Fare for snitsår på linsemodulets skarpe kanter**

Linsemodulets gevind kan have skarpe kanter.

### Tilsigtet brug

Allied Vision produktets tilsigtede brug er en indbygning i et visionssystem, udført af fagfolk. Alle Allied Vision produkter sælges i B2B.

## DE - Deutsch

### Sicherheit

Bevor Sie die Kamera benutzen, lesen diese Sicherheitshinweise. Beachten Sie diese Hinweise immer. Verwenden Sie die Kamera nur wie beschrieben in [Intended use](#) auf Seite 36.



#### VORSICHT

##### **Gefahr von Verbrennungen**

Im Betrieb kann die Kamera Temperaturen erreichen, die zu Verbrennungen führen.



#### VORSICHT

##### **Verletzung durch fallende Kameras oder Objektive**

Eine fallende Kamera oder ein fallendes Objektiv kann Verletzungen verursachen.



#### VORSICHT

Schnitte durch scharfkantige Objektivgewinde

Objektivgewinde können scharfe Kanten haben.

### Bestimmungsgemäßer Gebrauch

Allied Vision Produkte sind bestimmt für die Integration in Bildverarbeitungssysteme durch Fachpersonal. Alle Allied Vision Produkte werden in einer B2B-Umgebung verkauft.

## ES - Español

### Seguridad

Antes de utilizar la cámara lea estas instrucciones de seguridad. Observe las advertencias en todo momento. Utilice la cámara solo tal y como se estipula en el [Intended use](#) en la página 36.



#### ATENCIÓN

##### **Riesgo de quemaduras**

Una cámara en funcionamiento puede alcanzar temperaturas que podrían provocar quemaduras.



#### ATENCIÓN

##### **Lesiones en caso de que las cámaras o las lentes se caigan**

Si una cámara o una lente se cae puede provocar lesiones.



#### ATENCIÓN

##### **Riesgo de cortes debido a los bordes afilados del objetivo**

Las roscas de los objetivos pueden tener bordes afilados.

### Uso previsto

El uso previsto del producto Allied Vision es la integración en el sistema de visión por parte de profesionales. Todos los productos Allied Vision se venden dentro de una relación B2B.

## FI - Suomi

### Turvallisuus

Lue nämä turvallisuusohjeet ennen kameran käyttöä. Noudata varoituksia joka hetki. Käytä kameraa ainoastaan kohdassa [Intended use](#) sivulla 36 kuvatulla tavalla.



#### **HUOMIO**

##### **Palovammojen vaara**

Käytössä olevan kameran saavuttamat lämpötilatasot voivat aiheuttaa palovammoja.



#### **HUOMIO**

##### **Putoavien kameroiden tai linssien aiheuttamat vammat**

Putoava kamera tai linssi voi aiheuttaa vammoja.



#### **HUOMIO**

##### **Linssien kiinnikkeiden terävien reunojen aiheuttamien viiltovammojen vaara**

Linssin kiinnikkeiden kierteiden reunat voivat olla teräviä.

### Käyttötarkoitus

Allied Vision-tuotteen käyttötarkoitus on integrointi kuvajärjestelmiin ammattilaisten toimesta. Kaikki Allied Vision-tuotteet myydään B2B-ympäristössä.

## FR - Français

### Sécurité

Veillez lire ces consignes de sécurité avant d'utiliser la caméra. Respectez continuellement les avertissements. Utilisez la caméra uniquement comme indiqué sous [Intended use](#), page 36.



#### ATTENTION

##### Risque de brûlures

Une caméra en service peut atteindre des niveaux de température susceptibles d'entraîner des brûlures.



#### ATTENTION

##### Blessures en cas de chute de caméras ou d'objectifs

La chute d'une caméra ou d'un objectif peut entraîner des blessures.



#### ATTENTION

##### Risque de coupures sur les bords tranchants des montures d'objectif

Les filetages des montures d'objectif peuvent présenter des bords tranchants.

### Utilisation prévue

L'utilisation prévue du produit Allied Vision est son intégration dans des systèmes de vision par le soin de professionnels. Tout produit Allied Vision est vendu dans un cadre B2B.

## IT - Italiano

### Sicurezza

Leggere queste istruzioni per la sicurezza prima di utilizzare la telecamera. Osservare sempre tutte le avvertenze. Utilizzare la telecamera come descritto alla sezione [Intended use](#) a pagina 36.



#### ATTENZIONE

##### **Pericolo di ustioni**

Durante il funzionamento una telecamera può raggiungere temperature elevate che possono essere causa di ustioni.



#### ATTENZIONE

##### **Lesioni dovute alla caduta di telecamere o lenti**

La caduta di una telecamera o di una lente può causare delle lesioni.



#### ATTENZIONE

##### **Pericolo di tagliarsi sui bordi affilati degli attacchi della lente**

I bordi della filettatura dell'attacco della lente possono essere affilati.

### Uso previsto

Il prodotto Allied Vision è concepito per essere integrato in sistemi di monitoraggio in campo professionale. Tutti i prodotti Allied Vision sono venduti in uno scenario B2B.



## JA – 日本語

### 安全性

本カメラを使用する前に、この安全の手引きをお読みください。常に、警告事項を守ってください。必ず、[Intended use 36](#) ページの通りに、本カメラを使用してください。



#### 注意

##### やけどの危険性

作動中のカメラは、やけどを引き起こす温度まで熱くなる恐れがあります。



#### 注意

##### カメラまたはレンズの落下によるけが

カメラまたはレンズが落下すると、けがをする恐れがあります。



#### 注意

##### レンズマウントの鋭利な端部で切り傷の危険性

レンズマウントのギザギザの部分が鋭利である可能性があります。

### 用途

Allied Vision製品は、専門家が視覚装置に統合することを意図したものです。すべてのAllied Vision製品は、企業間取り引き用に販売されています。

## NL - Nederlands

### Veiligheid

Lees deze veiligheidsinstructies voordat u de camera gaat gebruiken. Neem deze waarschuwingen altijd in acht. Gebruik de camera uitsluitend, zoals aangegeven in het [Intended use](#) op pagina 36.



#### VOORZICHTIG

##### Risico van verbranding

Een camera die gebruikt wordt, kan temperatuurwaarden bereiken die brandwonden kunnen veroorzaken.



#### VOORZICHTIG

##### Letsel door vallende camera's of lenzen

Een vallende camera of lens kan letsel veroorzaken.



#### VOORZICHTIG

##### Risico van snijwonden door scherpe randen van lensbevestigingen

Het schroefdraad van de lensbevestiging kan scherpe randen hebben.

### Beoogd gebruik

Het beoogde gebruik van het Allied Vision-product is de integratie in optische systemen door professionals. Alle Allied Vision-producten worden verkocht in de B2B-markt.

## NO - Norsk

### Sikkerhet

Les disse sikkerhetsinstruksene før du bruker kameraet. Følg advarslene til en hver tid. Bruk kun kameraet i samsvar med [Intended use](#) på side 36.



#### FORSIKTIG

##### Risiko for brannskader

Et kamera i bruk kan nå temperaturnivåer som kan forårsake brannskader.



#### FORSIKTIG

##### Skade ved fallende kameraer eller linser

Et fallende kamera eller en fallende linse kan forårsake skade.



#### FORSIKTIG

##### Risiko for kutt fra skarpe kanter på linsefester

Sporene på linsefestet kan ha skarpe kanter.

### Tiltenkt bruk

Den tiltenkte bruken av Allied Vision-produktet er integrering i visjonssystemer av profesjonelle. Alle Allied Vision-produkter selges i en forretning til forretning-situasjon.

## SV - Svenska

### Säkerhet

Läs igenom säkerhetsinstruktionerna innan du använder kameran. Var hela tiden särskilt uppmärksam på varningarna. Använd enbart kameran på det sätt som anges i [Intended use](#) på sida 36.



#### VARNING

##### **Risk för brännskada**

En kamera i drift kan komma upp i temperaturer som kan orsaka brännskador.



#### VARNING

##### **Risk för skador från fallande kameror eller objektiv**

Fallande kameror eller objektiv kan förorsaka skador.



#### VARNING

##### **Risk för skärsår från vassa kanter på objektivfattningar**

Objektivets gängor kan ha vassa kanter.

### Avsedd användning

Den avsedda användningen av Allied Vision-produkter är integrering i visionssystem av fackmän. Samtliga Allied Vision-produkter säljs i en B2B-miljö.

# ZH – 英文简体中文版

## 安全需知

使用本相机前，请阅读本安全说明书。请务必遵守相关警告 和 [Intended use](#) 于第 36 页。



### 注意事项

#### 烫伤风险

相机操作过程中温度可能上升并导致烫伤风险。



### 注意事项

#### 相机或者镜头跌落造成伤害

相机或者镜头可能会跌落并造成伤害。



### 注意事项

#### 镜头接口的锐利边缘划伤风险

镜头接口螺纹边缘可能较为锐利。

## 预期用途

Allied Vision 产品的预期用途是由专业人士整合到视觉系统中。所有 Allied Vision 的产品均通过 B2B 渠道销售。

# Prosilica GT cameras at a glance



Get an overview of Prosilica GT camera documentation.


**Read this document carefully**

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

Prosilica GT cameras are engineered to cope with harsh environments, extreme temperature variations, and constantly changing light conditions. They have a GigE port and work with Gigabit Ethernet hardware and cable lengths up to 100 meters. Prosilica GT cameras are GigE Vision V1.2 and GenICam SFNC V1.2.1 compliant.

## Scope of delivery

Your Allied Vision camera is delivered with the following components:

- Prosilica GT GigE Vision camera
- Download instructions

## What else do you need?

Content	URL
GigE Features Reference, camera data sheets, Modular Concept, 3D CAD STEP files	<a href="http://www.alliedvision.com/en/support/technical-documentation/prosilica-gt-documentation">www.alliedvision.com/en/support/technical-documentation/prosilica-gt-documentation</a>
Technical papers and knowledge base	<a href="http://www.alliedvision.com/en/support/technical-papers-knowledge-base">www.alliedvision.com/en/support/technical-papers-knowledge-base</a>
Camera lenses and accessories	<a href="http://www.alliedvision.com/en/products/accessories">www.alliedvision.com/en/products/accessories</a>
<b>Vimba Suite</b> for Windows, Linux, and Linux/Arm, including <b>Vimba SDK</b> , <b>Vimba Viewer</b> , and <b>Vimba Driver Installer</b> for Windows	<a href="http://www.alliedvision.com/en/support/software-downloads">www.alliedvision.com/en/support/software-downloads</a>
Download the latest GigE firmware loader and release notes.	<a href="http://www.alliedvision.com/en/support/firmware">www.alliedvision.com/en/support/firmware</a>
For details about camera warranty duration and sensor warranty terms.	<a href="http://www.alliedvision.com/en/support/warranty">www.alliedvision.com/en/support/warranty</a>

*Table 1: Additional resources*

# Contact us

## Website

General

[www.alliedvision.com/en/contact](http://www.alliedvision.com/en/contact)

Distribution partners

[www.alliedvision.com/en/about-us/where-we-are](http://www.alliedvision.com/en/about-us/where-we-are)

## Email

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# Contents

Read before use	2
EN - English	2
DA - Dansk	3
DE - Deutsch	4
ES - Español	5
FI - Suomi	6
FR - Français	7
IT - Italiano	8
<b>JA - 日本語</b>	9
NL - Nederlands	10
NO - Norsk	11
SV - Svenska	12
ZH - 英文简体中文版	13
Prosilica GT cameras at a glance	14
Scope of delivery	15
What else do you need?	15
Contact us	16
Document history and conventions	22
Document history	23
Manual conventions	30
Typographic styles	30
Product naming	31
Acronyms and terms	32
Compliance, safety, and intended use	33
Compliance notifications	34
Intended use	36
Copyright and trademarks	36
Your safety	37
Handling lens mounts	37
Handling hot cameras	37
Providing optimum heat dissipation	37
Camera mounting	38
Product safety	39
Electrical connections	39
Optical components	40
Installing the camera	41
Touching hot cameras	42
Electrostatic discharge	42
Mounting the camera	42
Standard and extended format housing	43

Large Format housing . . . . .	43
Mounting the lens . . . . .	44
Configuring the host computer . . . . .	45
Installing the NIC driver . . . . .	46
Optional: Modifying NIC IP address . . . . .	46
Optimize system performance . . . . .	47
Connecting your camera . . . . .	48
Powering up the camera . . . . .	48
Powering the camera via Hirose I/O port . . . . .	50
Powering the camera via PoE . . . . .	50
Connecting to host application . . . . .	50
Allied Vision software . . . . .	50
Third-party software . . . . .	51
Configuring your camera . . . . .	51
Accessories . . . . .	52
<b>Specifications</b> . . . . .	<b>53</b>
Applied standards . . . . .	54
Shock and vibration . . . . .	54
Notes on specifications . . . . .	55
Specifications common to all models . . . . .	59
Prosilica GT1290 series . . . . .	60
Absolute QE . . . . .	62
Spectral response . . . . .	62
ROI frame rates . . . . .	63
Prosilica GT1380 series . . . . .	64
Absolute QE . . . . .	66
Spectral response . . . . .	66
ROI frame rates . . . . .	67
Prosilica GT1600 series . . . . .	68
Absolute QE . . . . .	70
Spectral response . . . . .	70
ROI frame rates . . . . .	71
Prosilica GT1920 series . . . . .	72
Absolute QE . . . . .	74
Spectral response . . . . .	74
ROI frame rates . . . . .	75
Prosilica GT1930 series . . . . .	76
Absolute QE . . . . .	78
Spectral response . . . . .	78
ROI frame rates . . . . .	79
Prosilica GT1930L series . . . . .	80
Absolute QE . . . . .	82
Spectral response . . . . .	82
ROI frame rates . . . . .	83
Prosilica GT2000 series . . . . .	84
Absolute QE . . . . .	86
Spectral response . . . . .	87
ROI frame rates . . . . .	88

Prosilica GT2050 series . . . . .	89
Absolute QE . . . . .	91
Spectral response . . . . .	92
ROI frame rates . . . . .	93
Prosilica GT2450 series . . . . .	94
Absolute QE . . . . .	96
Spectral response . . . . .	96
ROI frame rates . . . . .	97
Prosilica GT2460 series . . . . .	98
Absolute QE . . . . .	100
Spectral response . . . . .	100
ROI frame rates . . . . .	101
Prosilica GT2750 series . . . . .	102
Absolute QE . . . . .	104
Spectral response . . . . .	104
ROI frame rates . . . . .	105
Prosilica GT3400 series . . . . .	106
Absolute QE . . . . .	108
Spectral response . . . . .	108
ROI frame rates . . . . .	109
Prosilica GT4090 series . . . . .	110
Absolute QE . . . . .	112
Spectral response . . . . .	112
ROI frame rates . . . . .	113
Prosilica GT4096 series . . . . .	114
Absolute QE . . . . .	116
Spectral response . . . . .	116
ROI frame rates . . . . .	117
Prosilica GT4400 series . . . . .	118
Absolute QE . . . . .	120
Spectral response . . . . .	120
ROI frame rates . . . . .	121
Prosilica GT5120 series . . . . .	122
Absolute QE . . . . .	124
Spectral response . . . . .	124
ROI frame rates . . . . .	125
Prosilica GT5400 series . . . . .	126
Absolute QE . . . . .	128
Spectral response . . . . .	128
ROI frame rates . . . . .	129
Prosilica GT6400 series . . . . .	130
Absolute QE . . . . .	132
Spectral response . . . . .	132
ROI frame rates . . . . .	133
Prosilica GT model series comparison . . . . .	134
Frame rate comparison . . . . .	135
Camera feature comparison . . . . .	136
Standard and extended format models . . . . .	136

Large Format models .....	137
<b>Mechanical dimensions</b> .....	<b>139</b>
Standard format housing .....	140
C-Mount (default) .....	140
CS-Mount .....	142
Extended format housing .....	144
C-Mount .....	144
CS-Mount .....	145
Birger EF-Mount .....	146
F-Mount .....	147
M42-Mount .....	148
Large Format housing .....	149
C-Mount .....	149
EF-Mount PA .....	150
F-Mount (default) .....	152
F-Mount PA .....	154
M42-Mount PA .....	156
M42-Mount .....	157
M58-Mount PA .....	158
M58-Mount .....	159
TFL-Mount (35mm × 0.75) .....	160
Tripod adapter .....	161
1/40-20 tripod mount for Large Format cameras .....	162
Lens protrusion .....	163
Standard and extended format cameras .....	163
Large Format cameras .....	164
Flange focal distance .....	166
Standard and extended cameras .....	166
Large Format cameras .....	167
Calibration variation .....	171
PA mounts .....	172
Sensor position accuracy .....	173
Optical filters .....	174
<b>Camera interfaces</b> .....	<b>175</b>
Back panel .....	176
Standard and extended format housing .....	176
Large Format housing .....	177
Status LEDs .....	178
Gigabit Ethernet port .....	179
Camera I/O connections .....	180
I/O connector pin assignment .....	180
I/O definition .....	182
Camera power .....	182
RxD RS232 and TxD RS232 .....	182
Input triggers .....	182
Output signals .....	184
Lens control .....	187

EF lens control.....	189
Camera trigger.....	191
Trigger timing diagram.....	191
Trigger definitions.....	192
<b>Image data flow</b>	<b>194</b>
Prosilica GT model series with CCD sensors.....	195
Prosilica GT model series with CMOS sensors.....	196
<b>Cleaning optical components</b>	<b>199</b>
Keep optical components clean.....	200
Identifying impurities.....	200
Locating impurities.....	201
Materials for cleaning optical components.....	201
Cleaning Instructions.....	202
Cleaning with compressed air.....	203
<b>Firmware update</b>	<b>204</b>
<b>Index</b>	<b>209</b>

# Document history and conventions



This chapter includes:

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

# Document history

Version	Date	Remarks
V3.2.2	2020-Jun-05	<ul style="list-style-type: none"> <li>Added <a href="#">Read before use</a> on page 2</li> <li>Added <a href="#">Your safety</a> on page 37</li> <li>Added <a href="#">Product safety</a> on page 39</li> <li>Added time between exposure values for Prosilica GT1290, GT1380, GT1600, GT1920, GT2000, GT2050, GT2450, GT2750, and GT3400</li> <li>Updated power supply order codes</li> <li>Updated <a href="#">Installing the camera</a> on page 41</li> <li>Editorial updates</li> </ul>
V3.2.1	2020-Mar-31	<ul style="list-style-type: none"> <li>Updated Prosilica GT4400, GT5400, and GT6400 exposure time and increment values (firmware version 00.01.54.29197), see the GigE Firmware Release Notes for additional information</li> <li>Updated compliance section and intended use statement</li> <li>Updated Prosilica GT4400, GT5400, GT6400 technical drawings</li> <li>Removed references to discontinued models: Prosilica GT1660, GT1910, GT2300, GT3300, GT4905, GT4907, GT6600</li> </ul>
V3.2.0	2019-Nov-14	<ul style="list-style-type: none"> <li>Initial commercial release: <a href="#">Prosilica GT4400 series</a> on page 118               <ul style="list-style-type: none"> <li>Sony IMX367 CMOS sensor</li> <li>Specifications, absolute QE plot, spectral response plot, ROI frame rate, image data flow</li> </ul> </li> <li>Initial commercial release: <a href="#">Prosilica GT5400 series</a> on page 126               <ul style="list-style-type: none"> <li>Sony IMX387 CMOS sensor</li> <li>Specifications, absolute QE plot, spectral response plot, ROI frame rate, image data flow</li> </ul> </li> <li>Initial commercial release: <a href="#">Prosilica GT6400 series</a> on page 130               <ul style="list-style-type: none"> <li>Sony IMX342 CMOS sensor</li> <li>Specifications, absolute QE plot, spectral response plot, ROI frame rate, image data flow</li> </ul> </li> <li>Changed the IR cut filter section to Optical filters and included all optical filters available for the Prosilica GT camera family</li> <li>New IR pass filters for standard and extended format cameras</li> <li>Removed references to discontinued models: Prosilica GT1660C and GT3300C</li> </ul>
V3.1.1	2019-Mar-08	<ul style="list-style-type: none"> <li>Editorial changes</li> </ul>

Table 2: Document history (sheet 1 of 8)

Version	Date	Remarks
V3.1.0	2019-Jan-31	<ul style="list-style-type: none"> <li>Updated Prosilica GT1930 and GT1930L series specifications (firmware version 00.01.54.20343), see the GigE Firmware Release Notes for details on the changes</li> <li>Updated Prosilica GT2460 series specifications (firmware version 00.01.54.20343), see the GigE Firmware Release Notes for details on the changes</li> <li>Updated Prosilica GT4090, GT4096, and GT5120 series specifications (firmware version 00.01.54.20443), see the GigE Firmware Release Notes for details on the changes</li> <li>Corrected Prosilica GT2050NIR exposure time control minimum value (changed from 34 <math>\mu</math>s to 50 <math>\mu</math>s)</li> <li>Corrected defect pixel masking feature type in the camera feature comparison table</li> <li>Added content in Installation chapter: Powering the camera via PoE</li> </ul>
V3.1.0	2019-Jan-31	<ul style="list-style-type: none"> <li>Added technical drawings for Prosilica GT extended housing models               <ul style="list-style-type: none"> <li>- CS-Mount</li> <li>- Birger EF-Mount</li> <li>- M42-Mount</li> </ul> </li> <li>Added technical drawing for Prosilica GT standard housing models               <ul style="list-style-type: none"> <li>- CS-Mount</li> </ul> </li> </ul>
V3.1.0	2019-Jan-31	<ul style="list-style-type: none"> <li>Added technical drawing for Prosilica GT1930 standard housing               <ul style="list-style-type: none"> <li>- CS-Mount</li> </ul> </li> <li>Added StreamHoldCapacity values for Prosilica GT1380, GT1920, GT3400, GT4090, GT4096, and GT5120 series</li> <li>Added Mounting the camera to Hardware and Installation chapter</li> <li>Added Supplier Declaration of Conformity to Compliance and intended use chapter</li> <li>Added EMC compliance statement to Installation and hardware chapter</li> <li>Added shock and vibration information</li> <li>Various other minor improvements and corrections</li> </ul>
V3.0.1	2018-Jun-19	<ul style="list-style-type: none"> <li>Corrected lens tool- adjustment wrench part number</li> <li>Updated RoHS statement to include amendment 2015/863/EU</li> </ul>

Table 2: Document history (sheet 2 of 8)



Version	Date	Remarks
V3.0.0	2018-May-01	<ul style="list-style-type: none"> <li>Initial commercial release: <a href="#">Prosilica GT2460 series</a> on page 98               <ul style="list-style-type: none"> <li>- Sony IMX264 CMOS sensor</li> <li>- Specifications, absolute QE plot, spectral response plot, ROI frame rate, image data flow</li> </ul> </li> <li>Simplified the Contact us section, click the link to find contact information for your region or email us at one of the provided email addresses.</li> <li>Added Specifications common to all models to simplify the model specific tables</li> <li>Removed references to Order code: 2685 Adlink GIE62+PCI ex4, two ports. For more information see the Product Change Notification.</li> <li>Various other minor improvements and corrections</li> <li>Added acronyms and abbreviations used in this manual</li> <li>Updated symbols used in this manual</li> <li>Updated Prosilica I/O table</li> </ul>
V2.9.0	2017-Aug-04	<ul style="list-style-type: none"> <li>Initial commercial release: <a href="#">Prosilica GT4090 series</a> on page 110               <ul style="list-style-type: none"> <li>- ON Semi PYTHON 12K CMOS sensor</li> <li>- Specifications, absolute QE plot, ROI frame rate, image data flow</li> </ul> </li> <li>Initial commercial release: <a href="#">Prosilica GT4096 series</a> on page 114               <ul style="list-style-type: none"> <li>- ON Semi PYTHON 16K CMOS sensor</li> <li>- Specifications, absolute QE plot, ROI frame rate, image data flow</li> </ul> </li> <li>Initial commercial release: <a href="#">Prosilica GT5120 series</a> on page 122               <ul style="list-style-type: none"> <li>- ON Semi PYTHON 25K CMOS sensor</li> <li>- Specifications, absolute QE plot, ROI frame rate, image data flow</li> </ul> </li> <li>Corrected the Out3 and Out4 trigger circuit specification from 20 mA to 8 mA</li> <li>Added Piecewise Linear HDR mode option to Exposure Mode for the Prosilica GT2000 and GT2050 series. For more information, see the GigE Features Reference</li> <li>Changed the Prosilica GT1930L standard mount to EF-Mount PA</li> </ul>
V2.9.0	2017-Aug-04	<ul style="list-style-type: none"> <li>Updated absolute QE plot for Prosilica GT cameras with CMOSIS/ams CMOS sensors</li> <li>Added cable color to camera I/O connector pin assignment including pin assignment figure and cross reference to the Allied Vision I/O cable data sheet</li> <li>Updated camera I/O connector pin assignment, input triggers, and output signals section</li> <li>Added note to Specifications chapter for lens support with heavy lens load and high vibration environments</li> <li>CMOSIS renamed to CMOSIS/ams following the acquisition of CMOSIS by ams Sensors Belgium</li> <li>Corrected exposure value range for Prosilica GT2000</li> <li>Changed Cell size terminology to Pixel size</li> <li>Various other minor improvements and corrections</li> </ul>

Table 2: Document history (sheet 3 of 8)

Version	Date	Remarks
V2.8.1	2016-Aug-16	<ul style="list-style-type: none"> <li>• Added optical filter information to specification tables</li> <li>• Trigger over Ethernet Action Command feature</li> <li>• Updated absolute QE plot for Prosilica GT cameras with Sony CCD sensors</li> <li>• Updated specification notes section</li> <li>• Various other minor improvements and corrections</li> <li>• New features for Prosilica GT2450 series including:               <ul style="list-style-type: none"> <li>- New PTP implementation</li> <li>- Temperature readout (main board and sensor board)</li> <li>- Look-up tables</li> <li>- Decimation X/Y</li> <li>- DeviceUserID</li> </ul> </li> </ul>
V2.8.0	2016-Jul-07	<ul style="list-style-type: none"> <li>• Added spectral response plot for Prosilica GT1930, GT1930L, and GT3400 series</li> <li>• Updated the absolute QE plot for GT1930 and GT1930L series</li> <li>• Added spectral response plot for Prosilica GT cameras with Sony CCD sensors</li> <li>• Updated absolute QE plot for Prosilica GT cameras with Sony CCD sensors</li> <li>• Updated the image flow diagrams</li> <li>• Trigger over Ethernet Action Command feature to select models</li> <li>• New features for Prosilica GT2000 and GT2050 series               <ul style="list-style-type: none"> <li>- Decimation X/Y</li> <li>- Reverse X/Y</li> <li>- DeviceUserID</li> </ul> </li> <li>• Feature change for Prosilica GT2000 and GT2050 series               <ul style="list-style-type: none"> <li>- Column defect masking has been replaced by pixel defect masking</li> </ul> </li> </ul>
V2.7.0	2016-May-11	<ul style="list-style-type: none"> <li>• Changed all instances of RegionY to OffsetY</li> <li>• Changed all instances of BinningY to BinningVertical</li> <li>• Aligned the information in the specification tables with the information on the webpages</li> <li>• New features for various Prosilica GT models including:               <ul style="list-style-type: none"> <li>- Decimation X/Y (single-tap and quad-tap cameras only)</li> <li>- Look-up tables</li> <li>- Reverse X/Y</li> <li>- Binning</li> <li>- Sensor digitization taps (single-tap and quad-tap cameras only)</li> </ul> </li> <li>• Added sensor tap mode note in the Specifications chapter</li> <li>• Updated frame rate information plots</li> <li>• Various other minor improvements and corrections</li> </ul>

Table 2: Document history (sheet 4 of 8)

Version	Date	Remarks
V2.6.0	2016-Mar-04	<ul style="list-style-type: none"> <li>Initial commercial release: <a href="#">Prosilica GT1930 series</a> on page 76               <ul style="list-style-type: none"> <li>Sony IMX174 CMOS sensor</li> <li>Specifications, absolute QE plot, spectral response plot, ROI frame rate, image data flow</li> </ul> </li> <li>Updated compliance statements</li> <li>Various minor corrections</li> <li>Added installation chapter</li> </ul>
V2.5.0	2015-Dec-21	<ul style="list-style-type: none"> <li>Changed the technical manual layout</li> <li>Changed chapter name from Camera data path to Image data flow and updated the figures</li> <li>Changed chapter name from Camera dimensions to Mechanical dimensions</li> <li>Merged the Resolution and ROI frame rates chapter into Specifications chapter</li> <li>Added <a href="#">Prosilica GT cameras at a glance</a> on page 14</li> <li>Added General safety notes section</li> <li>Added Regulations section in Safety and regulations chapter to replace Legal notice and Conformity sections</li> <li>Moved Sensor position accuracy section from Appendix to Mechanical dimensions chapter and deleted Appendix</li> <li>Added Camera features comparison section in Specifications chapter to replace Camera smart features and Camera features sections</li> <li>Added Cleaning optical components chapter to replace Camera cleaning and updated information</li> <li>Added Contact us section to replace Contacting Allied Vision section</li> <li>Updated Prosilica GT Large Format lens mount drawings</li> </ul>
V2.4.1	2015-Sep-15	<ul style="list-style-type: none"> <li>Added a note on removal of 4.75 K<math>\Omega</math> resistors from PCBA in Out 3 and 4 in Opto-isolated section</li> </ul>
V2.4.0	2015-Aug-25	<ul style="list-style-type: none"> <li>Updated color formats specification in Specifications chapter</li> <li>Updated camera I/O connector pin assignment, Input triggers and output signals sections</li> <li>Added camera feature comparison section to replace Camera smart features section of V2.3.0</li> </ul>
V2.3.0	2015-Mar-20	<ul style="list-style-type: none"> <li>Replaced old links with new Allied Vision website links</li> <li>Changed file name from GigE Camera and Driver Features to GigE Features Reference</li> <li>Changed chapter name from Description of data path to Camera data path</li> </ul>

Table 2: Document history (sheet 5 of 8)

Version	Date	Remarks
V2.2.0	2015-Mar-11	<ul style="list-style-type: none"> <li>• Initial commercial release: <a href="#">Prosilica GT1930L series</a> on page 80               <ul style="list-style-type: none"> <li>- Sony IMX174 CMOS sensor</li> <li>- Specifications, absolute QE plot, spectral response plot, ROI frame rate, EF lens control, image data flow</li> </ul> </li> <li>• Updated Allied Vision logo</li> <li>• Changed AVT and Allied Vision Technologies references to Allied Vision</li> <li>• Updated additional references section</li> <li>• Renamed Truesense references to ON Semi</li> <li>• Updated lens control port wiring</li> <li>• Updated image data flow diagrams for color Prosilica GT cameras in Description of the image data flow section</li> <li>• Updated the defect masking information for the following:               <ul style="list-style-type: none"> <li>- Prosilica GT monochrome cameras</li> <li>- Prosilica GT color cameras</li> </ul> </li> </ul>
V2.1.1	2014-Jul-14	<ul style="list-style-type: none"> <li>• Updated frame rate specification for Prosilica GT2000, GT2050, and GT3400 series</li> <li>• 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</li> <li>• Added a note on binning in block diagram of Prosilica GT color cameras with CCD sensors</li> <li>• Added link to the technical drawing for Prosilica GT Large Format camera with M42-Mount and M58-Mount</li> <li>• Updated sensor position accuracy section</li> <li>• Updated minimum exposure time for Prosilica GT2000 and GT2050 series</li> <li>• Updated the power consumption specification in the Specifications chapter</li> <li>• Replaced the optical flange focal distance section with the following sections:               <ul style="list-style-type: none"> <li>- C-Mount flange focal distance</li> <li>- F-Mount flange focal distance</li> </ul> </li> <li>• Updated information on Prosilica GT Out 3 and Out 4 trigger circuit and in section Output: Opto-isolated internal circuit</li> <li>• Updated temperature monitoring information in the Specifications chapter</li> <li>• Updated filter and lenses section</li> <li>• Replaced A/D and bit depth with Max. image bit depth in the Specifications chapter</li> <li>• Added M42-Mount technical drawing links for Prosilica GT standard and extended cameras</li> </ul>
V2.1.0	2013-Oct-28	<ul style="list-style-type: none"> <li>• Added description of the image data flow chapter</li> <li>• Added section Adjustment of F-Mount</li> </ul>

Table 2: Document history (sheet 6 of 8)

Version	Date	Remarks
V2.0.9	2013-Sep-16	<ul style="list-style-type: none"> <li>• Updated the Mechanical dimensions chapter</li> <li>• Updated lens control section</li> <li>• Updated color cameras with IR cut filter section</li> <li>• Updated the specifications for Prosilica GT2000C and GT2050C</li> <li>• Added a note on the locking screw cables</li> <li>• Added optical flange focal distance and maximum lens protrusion information for C-Mount and F-Mount</li> <li>• Added 1 inch lens format recommendation for Prosilica GT2000 series</li> <li>• Added temperature monitoring information in the Specifications chapter</li> <li>• Added frame rate tables in the Specifications chapter</li> </ul>
V2.0.8	2013-Jul-05	<ul style="list-style-type: none"> <li>• Added links to Allied Vision GigE Camera and Driver Features document</li> </ul>
V2.0.7	2013-May-16	<ul style="list-style-type: none"> <li>• Updated the bit depth and exposure control camera specifications in the Specifications chapter</li> <li>• Updated pixel format naming according to the GenICam naming convention</li> <li>• Corrected camera dimensions and mass for Prosilica GT3400</li> <li>• Corrected the absolute QE plot for Prosilica GT3400</li> <li>• Added Vimba SDK link</li> <li>• Added ROI frame rate plots for Prosilica GT3400</li> <li>• Updated ROI frame rate plots in Specifications chapter</li> <li>• Updated Allied Vision recommended cabling to CAT6 or higher in Gigabit Ethernet port section</li> </ul>
V2.0.6	2013-Feb-12	<ul style="list-style-type: none"> <li>• Added status LEDs section</li> <li>• Updated the RoHS directive</li> </ul>
V2.0.5	2013-Jan-14	<ul style="list-style-type: none"> <li>• Initial commercial release: <a href="#">Prosilica GT3400 series</a> on page 106               <ul style="list-style-type: none"> <li>- Sony ICX814 CCD sensor</li> <li>- Specifications, absolute QE plot, spectral response, ROI frame rate, image data flow</li> </ul> </li> <li>• Updated the circuits diagrams in the camera trigger section</li> <li>• Updated the Prosilica GT trigger circuit values</li> <li>• Removed the supported P-Iris section</li> <li>• Updated the exposure control values</li> </ul>
V2.0.4	2012-Sep-21	<ul style="list-style-type: none"> <li>• Initial commercial release: <a href="#">Prosilica GT2000 series</a> on page 84               <ul style="list-style-type: none"> <li>- CMOSIS/ams CMV2000 CMOS sensor</li> <li>- Specifications, absolute QE plot, ROI frame rate, image data flow</li> </ul> </li> <li>• Initial commercial release: <a href="#">Prosilica GT2050 series</a> on page 89               <ul style="list-style-type: none"> <li>- CMOSIS/ams CMV4000 CMOS sensor</li> <li>- Specifications, absolute QE plot, ROI frame rate, image data flow</li> </ul> </li> <li>• Link added to RS232 application note</li> <li>• Added lens control port wiring</li> <li>• Renamed camera IO signals</li> </ul>
V2.0.3	2012-Jun-21	<ul style="list-style-type: none"> <li>• Added DC-Iris information</li> </ul>

Table 2: Document history (sheet 7 of 8)

Version	Date	Remarks
V2.0.1	2012-Mar-08	<ul style="list-style-type: none"> <li>Added absolute QE plots</li> <li>Added Prosilica GT1920 and GT2750 frame rate plots</li> </ul>
V2.0.0	2011-Dec-12	<ul style="list-style-type: none"> <li>New manual release status</li> </ul>

Table 2: Document history (sheet 8 of 8)

## Manual conventions

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

### Typographic styles

Style (example)	Function
<b>Emphasis</b>	Programs, or highlighting important things.
Feature names	GigE features names are displayed as monospaced text.
<i>Feature options</i>	Features options and register's options that are selectable by the user are displayed as monospaced italicized text.
<b>UI Element</b>	Text that is displayed, or output, by the system for the user, like parts of the GUI, dialog boxes, buttons, menus, important information, windows titles.
<a href="#">Web Reference</a>	References to other documents or webpages, like web links, hypertext links, emails, but also cross references, that include a link the user can follow by clicking.

Table 3: Typographic styles

### Symbols and notes



#### CAUTION

##### Risk of burns

Precautions are described



#### CAUTION

##### Injury by falling cameras or lenses

Precautions are described


**CAUTION**
**Risk of cuts by sharp edges of lens mounts**

Precautions are described


**NOTICE**
**Material damage**

Precautions are described.


**NOTICE**
**Material damage by electrostatic discharge (ESD)**

Precautions as described.


**Avoiding malfunctions**

Precautions are described.


**Practical tip**

Additional information helps to understand or ease handling the camera.


**Additional information**

Web address or reference to an external source with more information is shown.

## Product naming

Names of third-party products in this document are shortened to ease reading. Nevertheless, we respect all manufacturer rights and trademarks.

Official company name	Naming in this document	Manufacturer website
Sony Semiconductor Solutions	Sony	<a href="http://Sony-semicon.co.jp">Sony-semicon.co.jp</a>
ON Semiconductor	ON Semi	<a href="http://ONsemi.com">ONsemi.com</a>
ams Sensors Belgium	CMOSIS/ams	<a href="http://ams.com/cmos-imaging-sensors">ams.com/cmos-imaging-sensors</a>

Table 4: Third-party product naming

## Acronyms and terms

The following table provides a list of acronyms and terms used in this document.

Acronym or term	Description
ADC	Analog-to-digital converter
AIA	Automated Imaging Association
CAD	Computer aided design
CCD	Charge-coupled device
CMOS	Complementary metal-oxide semiconductor
CRA	Chief Ray Angle
EMVA	European Machine Vision Association
ESD	Electrostatic discharge
FIFO	First-in first-out
GigE	Gigabit Ethernet
GND	Ground (power)
GVSP	GigE Vision Streaming Protocol
H × V	Horizontal × Vertical (sensor resolution measurement)
I/O	Input/Output
KΩ	Kiloohm
LUT	Look-up table
MSDS	Material safety data sheet
NIC	Network interface card
NIR	Near Infrared
PA	Planarity adjusted
PSE	Power sourcing equipment
PTP	Precision Time Protocol
QE	Quantum efficiency
ROI	Region of interest
SDK	Software Development Kit
ToE	Trigger over Ethernet Action Command
TTL I/O	Transistor-transistor logic input/output
TxD and RxD	Transmit and receive

*Table 5: Acronyms and terms used in this document*



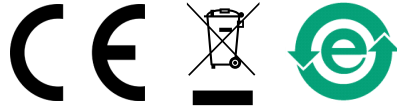
# Compliance, safety, and intended use



This chapter includes:

- Compliance notifications
- Information about intended use of the camera
- Copyright and trademark statement
- Your safety
- Product safety

## Compliance notifications



### For customers in the US



#### **Class A digital device**

Note: 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 commercial 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

We caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### Supplier Declaration of Conformity

Prosilica GT cameras comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

### Party issuing Supplier's Declaration of Conformity

Allied Vision Technologies GmbH  
Taschenweg 2a  
07646 Stadtroda, Germany  
T// +49 (36428) 677-106  
quality@alliedvision.com

## Responsible party - US contact information

Allied Vision Technologies, Inc.  
102 Pickering Way – Suite 502  
Exton, PA 19341, USA  
T// +1 978 225 2030

**Note:** changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## For customers in Canada

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

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

## Pour utilisateurs au Canada

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

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

## Avoid electromagnetic interferences

For all power and interface connections, only use shielded cables or cables recommended by Allied Vision.

## Intended use

Allied Vision's objective is the development, design, production, maintenance, servicing and distribution of digital cameras and components for image processing. We are offering standard products as well as customized solutions.

Intended use of Allied Vision product is the integration into Vision systems by professionals. All Allied Vision product is sold in a B2B setting.

Allied Vision isn't a legal manufacturer of medical product. Instead, Allied Vision cameras and accessories may be used as components for medical product after design-in by the medical device manufacturer and based on a quality assurance agreement (QAA) between Allied Vision (supplier) and medical device manufacturer (customer). Allied Vision's duties in that respect are defined by ISO 13485, clause 7.2 (customer-related processes, equivalent to ISO 9001, clause 8.2).

## Copyright and trademarks

All text, pictures, and graphics are protected by copyright and other laws protecting intellectual property. All content is subject to change without notice.

All trademarks, logos, and brands cited in this document are property and/or copyright material of their respective owners. Use of these trademarks, logos, and brands does not imply endorsement.

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## Your safety

This section informs about issues related to your personal safety. Descriptions explain how to avoid hazards and operate Prosilica GT cameras safely.

### Handling lens mounts

The lens mount thread has sharp edges. Be careful these edges do not cut your skin when mounting or unmounting lenses.

### Handling hot cameras

If you hold the camera in your hands during operation, your skin may get hurt. If you touch the camera when it is heated up, we recommend wearing protective gloves.

### Providing optimum heat dissipation

Operation outside the allowed temperature range can damage the camera. For best performance and to protect the camera from damage, keep the housing temperature in the specified operating temperature range.

Observe the following:

- To avoid camera crashes, operate the camera with a lens or lens adapter attached only.
- For maximum heat dissipation, affix the camera to a heat sink, using the mounting holes.
- Use mounting base and heat sink with large surface areas.
- Use a mounting base with a high thermal conductivity.
- Reduce ambient temperature. For example, in an outdoor application with direct sunlight, provide shading by an enclosure.
- Provide ventilation or other active cooling of camera, mounting base, and heat sink.

## Camera mounting

Prosilica GT cameras must be mounted using the mounting threads. If vibration is higher than specified, cameras can disconnect from the mounting. Falling cameras can hurt you. To avoid personal injury:

- Mount the camera according to the instructions in the installation chapter.
- Ensure, shock and vibration do not exceed the specified range as specified in the specifications chapter.
- For heavy or long lenses, use a lens support and apply tests.

## Lens load

Many of the lens mount styles available such as M42-Mount, F-Mount, and EF-Mount are not designed for high vibration environments with a heavy lens load. We recommend supporting the lens externally in these environments.

# Product safety

To prevent material damage, read the following to understand how to safely handle and operate the camera.

## Electrical connections

### ESD

ESD is dangerous for electronic devices, especially when tools or hands get in contact with connectors. We recommend measures to avoid damage by ESD:

- Unpacking: Remove the camera from its anti-static packaging only when your body is grounded.
- Workplace: Use a static-safe workplace with static-dissipative mat and air ionization.
- Wrist strap: Wear a static-dissipative wrist strap to ground your body.
- Clothing: Wear ESD-protective clothing. Keep components away from your body and clothing. Even if you are wearing a wrist strap, your body is grounded but your clothes are not.

### Cable connections

Provide sufficient strain relief for all cable connections to avoid short circuits and malfunctions.

### Camera power

The maximum power supplied via PoE is 13 watts. EF lens power requirements varies from lens to lens; however, typical ratings are in the 3 to 4 watt range. Should your lens and camera power requirements exceed 13 watts, it is necessary to power the camera via the Hirose I/O port.

Don't operate the camera beyond the environmental specifications. See environmental specifications limits in the Specifications section of this document. Special care must be taken to maintain an operating temperature as specified in the Specifications chapter.

Operating cameras beyond the specified range damages cameras. The camera is not intended to be connected to a DC distribution network.

## Optical components

Provide the following conditions to keep dirt and droplets out of the optical system of camera and lens:

- Dust-free environment
- Low relative humidity
- No condensation.

When camera or lens are stored:

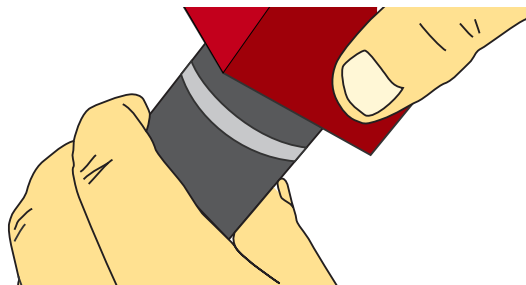
- Cover the lens mount with a protection foil or cap.
- Cover front and back lens with caps.

## Sensor

Sensors are sensitive to excessive radiation: focused sunlight, lasers, and X-rays can damage the sensor. Dirt and scratches can damage the sensor as well.

Prosilica GT cameras do not need additional cleaning. Cameras are cleaned before shipping. Incorrect cleaning can damage the sensor or the filter. Therefore, never clean the sensor or the filter.

Protect the camera filter and the sensor from dirt, because dirt becomes more visible the closer it gets to the sensor. In addition, keep the back lens clean. Hold the camera with the lens mount facing the ground to keep dirt out of the lens mount.



*Figure 1: Holding the camera with the lens mount facing the ground*

## Lenses

### Maximum protrusion

The sensor, filter, lens, or camera electronics can be damaged if a lens exceeding maximum protrusion is mounted to the camera. Use lenses with a maximum protrusion within camera specifications.



# Installing the camera



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

## Touching hot cameras



### CAUTION

#### Risk of burns

A camera in operation can reach temperature levels which could cause burns.

- Wear protective gloves when you touch a camera that is heated up.
- Ensure proper cooling of the camera.

## Electrostatic discharge



### NOTICE

ESD is dangerous for electronic devices, especially when tools or hands get in contact with connectors. We recommend measures to avoid damage by ESD:

- Unpacking: Remove the camera from its anti-static packaging only when your body is grounded.
- Workplace: Use a static-safe workplace with static-dissipative mat and air ionization.
- Wrist strap: Wear a static-dissipative wrist strap to ground your body.
- Clothing: Wear ESD-protective clothing. Keep components away from your body and clothing. Even if you are wearing a wrist strap, your body is grounded but your clothes are not.

## Mounting the camera



### CAUTION

#### Injury by falling cameras or lenses

A falling camera or lens can cause injury.

- Ensure proper mounting of cameras and lenses, especially for dynamic applications.
- Mount cameras as described in the instructions.
- Use a lens support for heavy lenses.

## Standard and extended format housing

You can attach the camera to a base using the M3 thread mounting holes built into the top, bottom, and front of the Prosilica GT camera housing. Optionally, you can use the tripod adapter to mount your Prosilica GT camera to a tripod.

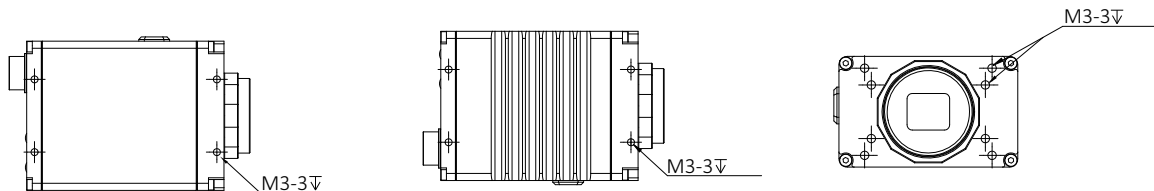


Figure 2: Mounting holes in top, bottom, and front of camera



### NOTICE

Please observe the following when mounting the camera:

- It is important to consider the maximum intrusion depth of the M3 mounting holes. Using longer screws can damage the threads or bottom plate and will reduce the strength of the joint.
- Use a spacer, spring lock washer, or internal tooth lock washer to reduce the intrusion depth of longer screws.
- Apply low-strength thread-locking fluid to the screws to prevent loosening of the screws under vibrational loading.

## Large Format housing

You can attach the camera to a base using the M3 thread mounting holes built into the top, bottom, sides, and front of the Prosilica GT camera housing and lens mount. Prosilica GT Large Format cameras also have a built-in 1/4-20 tripod mounting hole on two sides.

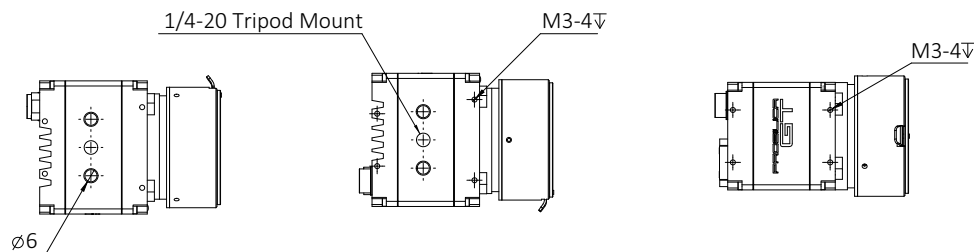


Figure 3: Mounting holes in top, bottom, and sides of camera


**NOTICE**

Please observe the following when mounting the camera:

- It is important to consider the maximum intrusion depth of the M3 mounting holes. Using longer screws can damage the threads or bottom plate and will reduce the strength of the joint.
- Use a spacer, spring lock washer, or internal tooth lock washer to reduce the intrusion depth of longer screws.
- Apply low-strength thread-locking fluid to the screws to prevent loosening of the screws under vibrational loading.

## Mounting the lens


**CAUTION**
**Injury by falling cameras or lenses**

A falling camera or lens can cause injury.

- Ensure proper mounting of cameras and lenses, especially for dynamic applications.
- Mount cameras as described in the instructions.
- Use a lens support for heavy lenses.


**CAUTION**
**Risk of cuts by sharp edges of lens mounts**

The threads of the lens mount can have sharp edges.

Be careful when mounting or unmounting lenses.


**NOTICE**

Many of the lens mount styles available such as M42-Mount, F-Mount, and EF-Mount are not designed for high vibration environments with a heavy lens load. We recommend supporting the lens externally in these environments.


**NOTICE**

As monochrome and NIR models don't have an optical filter, always attach a dust cap when a lens is not attached to minimize the possibility of contaminants falling on the sensor surface.

**NOTICE**

Provide the following conditions to keep dirt and droplets out of the optical system of camera and lens:

- Dust-free environment
- Low relative humidity
- No condensation

To keep dirt out of the lens mount, hold the camera with the lens mount facing the ground. Keep filter and camera back lens clean, because dirt becomes more visible the closer it gets to the sensor.

**NOTICE**

Image sensors are sensitive to excessive radiation: focused sunlight, lasers, and X-rays can damage the sensor.

Prosilica GT cameras offer various lens mounts for installing a lens including C-Mount, CS-Mount, F-Mount, F-Mount PA, M42-Mount, M42-Mount PA, M58-Mount PA, M58-Mount PA, and Canon EF-Mount PA depending on the model. Lenses can be purchased directly from Allied Vision or from an Allied Vision distribution partner. Users need to select the desired focal length of the lens and appropriate optical format for the target camera model.

For more information on lens mount options for your Prosilica GT camera, see the Modular Concept. For information on available lenses and accessories for your camera, see the Accessories webpage.

## Configuring the host computer

Prosilica GT cameras can operate on 10/100 or Gigabit speed NICs. In order to reach the maximum camera frame rate, a Gigabit speed NIC with jumbo packet support is required.

If your host computer has an available Ethernet port, this can be used with your Prosilica GT camera. We recommend that your camera system uses a dedicated Ethernet port not shared with internet or local area networks. If more ports are required, or your existing NIC is unable to operate at Gigabit Ethernet speeds, installing additional hardware may be required.

Usage on mixed-use networks (with printers, internet, and email) is possible but may impact camera performance (for example, frame rate). Check with your network administrator if required for network configuration.

## Installing the NIC 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 NIC, 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** after the driver has been installed.

## Optional: Modifying NIC IP address

After the initial NIC hardware installation, connect the NIC 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 NIC address to minimize the time required for a camera to be recognized by the host application.

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

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

When systems employ multiple NICs connected to multiple cameras the address of the NICs should be set. Each NIC or NIC card port requires a unique IP address.

For example:

NIC 1:

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

NIC 2:

- IP Address: 169.254.100.2
- Subnet mask: 255.255.0.0
- Default gateway: blank



In general, we recommend to use high performance Gigabit Ethernet network equipment to achieve best results and maximum performance for the communication and acquisition of images with GigE Vision cameras.

For best performance when operating Allied Vision Gigabit Ethernet cameras on a Windows-based system, we recommend installing the GigE Vision Filter Driver on the corresponding network interface.

Additional to the performance increase by using the GigE Vision Filter Driver which will result in a limitation of the interrupt rate, we recommend to optimize the following settings on the system.

## Optimize system performance

The NIC 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 NIC driver properties according to the values in the following table. The names and availability of the properties listed may vary depending on NIC manufacturer and model.

Property	Value
Packet size or maximum transmission unit	8228 bytes or larger
Interrupt moderation	Enable
Interrupt moderation rate	Extreme
Receive buffers	Maximum value configurable
Transmit buffers	512 bytes

*Table 6: Network interface card driver settings*

### Default packet size

The default packet size of Prosilica GT cameras is 8228 bytes. The host NIC needs to support a packet size of equal or larger size to stream from the camera.

### NIC settings

The NIC settings may also vary depending on your system configuration and the NIC manufacturer.

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

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

## Enabling jumbo packets

The properties listed for the NIC 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 NIC that supports Jumbo Frames or 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 NIC, 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 CAT6 or higher rated Ethernet cable to connect the camera to the NIC. Crossover cabling is not required but does work. The camera has circuitry to determine if a crossover cable is being used.



We recommend CAT6 or higher rated Ethernet cables. A cable with a lower rating may not sustain peak interface bandwidth; leading to lost connectivity or dropped frames coming from the camera.

## Powering up the camera

A camera power adapter for each GigE camera is available from Allied Vision. See the Specifications chapter for connector definition and voltage specifications.



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

- Order code: 13869 (Desktop power supply without connection cable)
- Order code: 13866 (AC power cable, 1.8 m, US to C13)
- Order code: 13865 (AC power cable, 1.8 m, EU to C13)



**NOTICE**

- Use only DC power supplies with insulated cases.
- For all power connections, use only shielded cables to avoid electromagnetic interference.
- Prosilica GT cameras can source power from:
  - IEEE 802.3at Type 1 (100 Mbps and 1000 Mbps)
  - IEEE 802.3at Type 1 compliant PoE power sourcing equipment devices such as switches, injectors, or NICs.

**NOTICE**

The maximum power supplied via PoE is 13 watts. EF lens power requirements varies from lens to lens; however, typical ratings are in the 3 to 4 watt range. Should your lens and camera power requirements exceed 13 watts, it is necessary to power the camera via the Hirose I/O port.

**NOTICE**

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

**NOTICE**

Don't operate the camera beyond the environmental specifications. See environmental specifications limits in the Specifications section of this document. Special care must be taken to maintain an operating temperature as specified in the Specifications chapter.

**NOTICE**

Operation outside the allowed temperature range can damage the camera. For best performance and to protect the camera from damage, keep the housing temperature in the specified operating temperature range.

Observe the following:

- To avoid camera crashes, operate the camera with a lens or lens adapter attached only.
- For maximum heat dissipation, affix the camera to a heat sink, using the mounting holes.
  - Use mounting base and heat sink with large surface areas.
  - Use a mounting base with a high thermal conductivity.
- Reduce ambient temperature. For example, in an outdoor application with direct sunlight, provide shading by an enclosure.
- Provide ventilation or other active cooling of camera, mounting base, and heat sink.



The camera is not intended to be connected to a DC distribution network. The maximum length for I/O cables must not exceed 30 meters.

## Powering the camera via Hirose I/O port

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

## Powering the camera via PoE

Note the following when using PoE accessories with PoE-capable GigE cameras:

- Prosilica GT cameras conform to the IEEE 802.3at Type 1 standard.
- Ensure that your PSE provides data over all four pairs.
- If the PSE uses only two out of four pairs for data, operation is limited to 10/100 Mbps. This translates to lower frame rates.
- If the PSE uses all four pairs for data, operation is in Gigabit (1000 Mbps) mode. Thus, allowing you to achieve the maximum possible frame rate.

# Connecting to host application

After you have installed **Vimba Viewer** or a third-party application to your host computer, connect your Prosilica GT camera via an Ethernet cable. If your camera is not PoE powered, connect the Hirose cable to power the camera.

Prosilica GT cameras work with the following software options:

- Vimba Viewer or Vimba SDK
- Third-party software solutions

## Allied Vision software

All software packages provided by Allied Vision are free of charge and contain the following components:

- Drivers
- SDK for camera control and image acquisition
- Examples based on the provided APIs of the SDK
- Documentation and release notes
- Viewer application to operate and configure the cameras

Vimba is Allied Vision's GenICam-based SDK with transport layers for all Allied Vision cameras with GigE Vision, USB3 Vision, IEEE 1394, and Camera Link interface. Vimba runs on Windows, Linux, and Linux for ARM. You can port your source code from Windows to Linux or cross-compile from a Linux PC to an embedded system.

Vimba provides APIs for C, C++, and .NET. Users who quickly want to develop a straightforward application love the simplicity of the C API or the .NET API.

Advanced users with high demands appreciate the C++ API, which is designed as a highly efficient and sophisticated API for advanced object-oriented programming including the STL (standard template library), shared pointers, and interface classes.

Vimba includes programming examples in C, C++, and C# and an extensive user documentation.



#### **Vimba Viewer documentation**

Vimba Viewer documentation is included with the software download. After Vimba Viewer is installed on your host computer, documentation is located under `\Program Files\Allied Vision\Vimba`.

## Third-party software

In addition to the software provided by Allied Vision, there are numerous GigE Vision standard compliant third-party software options available. In general, third-party software provides increased functionality such as image processing and video recording.

GenICam-based third-party software automatically connects with Vimba's transport layers. Additionally, Vimba includes the Cognex Adapter for VisionPro.

## Configuring your camera

After the host PC is configured, it is necessary to configure the parameters in the camera to establish the connection with best performance. It is necessary to note the value for the feature `GevSCSPacketSize` which defines the size of the network packets and also the size of the feature `StreamBytesPerSecond` which controls the available bandwidth of the network interface.

If just one camera is connected, the maximum value can be used and therefore set to 124,000,000. When using multiple cameras simultaneously on one network adapter through a switch, we recommend to divide the available amount of `StreamBytesPerSecond` by the number of connected cameras. When two cameras with the same parameter share the available bandwidth, the usable maximum value for each camera is 62,000,000.

## Accessories

We offer a wide range of accessories for use with Prosilica GT cameras including:

- GigE accessories such as standard GigE components and PoE capable GigE components.
- Lenses for corresponding sensor sizes and resolutions.

Contact your Allied Vision Sales team or your local Allied Vision distribution partner for information on accessories and lens recommendations.



A list of recommended GigE components is available on the Allied Vision website. See the Hardware Selection for Allied Vision GigE Cameras application note at [www.alliedvision.com/en/support/technical-papers-knowledge-base](http://www.alliedvision.com/en/support/technical-papers-knowledge-base).

# Specifications



This chapter provides:

- Applied standards
- Technical specifications
- Absolute QE plots
- Spectral response plots
- ROI frame rate plots
- Comparison of feature availability in various Prosilica GT camera model series

## Applied standards

### GigE Vision®

The GigE Vision standard is an interface standard for digital machine vision cameras administered by the 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 EMVA. The aim of GenICam is to provide a generic configuration interface for cameras and devices independent of the used interface technology (for example, GigE Vision, USB3 Vision, DCAM IEEE 1394, 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 SFNC that standardizes feature names and types via an XML file or the transport layer interface (GenTL) that is used to grab images.

## Shock and vibration

Prosilica GT standard, extended, and Large Format cameras were successfully tested according to the following standards:

- IEC 60068-2-6, Sinusoidal vibration testing
- IEC 60068-2-27, Non-repetitive shock testing
- IEC 60068-2-27, Repetitive shock testing
- IEC 60068-2-64, Random vibration testing

If you need more details, please contact [support@alliedvision.com](mailto:support@alliedvision.com).

# Notes on specifications

This section defines the conditions for specifications stated in this chapter.

## Dimensions and mass

Dimensions include lens mount and connectors but not the tripod and lens.

Mass does not include the tripod and lens.

Both dimensions and mass values in the specification tables are for the default configuration of the camera (default housing and lens mount).

## Mono8 pixel format

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

## Modular options

Prosilica GT and Prosilica GT Large Format cameras can be ordered with several modular options including lens mount, optical filter, and sensor options. For more information, see the Modular Concept.

## ON Semi sensor change

Prosilica GT color models with ON Semi sensors now use sensors with the latest generation 2 CFA materials. For more information, see the Product Change Notification on the Allied Vision website.

## 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 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, 8-bit pixel format (**Mono8** or **Bayer8**), and a **GevSCPSPacketSize = 8192** bytes per packet.

## Resolution and ROI frame rates

Resolution and ROI frame rates are 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 provides a frame rate increase. Cameras with a “burst mode” frame rate are able to output more data than the maximum available bandwidth (**124 Mbps**), and have a frame rate increase with a reduction in width.

## Resolution and ROI measurements

- Data was generated using **StreamBytesPerSecond = 124** Mbps (full bandwidth), minimum exposure, full resolution, and an 8-bit pixel format. Frame rate may be lower if using network hardware incapable of 124 Mbps.
- 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 sensor sensors before readout. The frame rate for an ROI at the same effective height as binning is slower because the sensor still needs to read out the “fast readout rows” in ROI mode.

## Frame rate and readout

Although the sensor is capable of higher frame rates, readout is limited by GigE bandwidth and exposure value. You can improve frame rates with an ROI and shorter exposure values.



## Sensor tap mode (CCD models only)

With quad-tap sensor mode you can achieve a higher frame rate than with single-tap mode. With single-tap sensor mode, you can achieve an image certain to be free of any tap-boundary artifacts. You can also use single-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. Sensor tap mode is applicable to quad-tap cameras only.



Image acquisition must be stopped before changing sensor tap mode.

### Affected features

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

Feature	Quad-tap mode	Single-tap mode
ReverseX	Available	Not available
ReverseY	Available	Not available
DecimationHorizontal	Available	Not available
DecimationVertical	Available	Not available

Table 7: Features affected when switching sensor tap mode

### Tap modes

Model series	Sensor tap mode
Prosilica GT1290	Single-tap
Prosilica GT1380	Single-tap
Prosilica GT1600	Single-tap
Prosilica GT1920	Quad-tap, Single-tap switchable in Vimba 2.0 or later
Prosilica GT2450	Dual-tap
Prosilica GT2750	Quad-tap, Single-tap switchable in Vimba 2.0 or later
Prosilica GT3400	Quad-tap, Single-tap switchable in Vimba 2.0 or later

Table 8: Sensor tap modes for CCD model series

## Absolute QE plots

All measurements were done without protection glass or IR cut filter. With protection glass or filters, QE decreases by approximately 10 percent.

The uncertainty in measurement of the QE values is  $\pm 10$  percent. This is mainly due to uncertainties in the measuring apparatus itself (Ulbricht sphere, optometer).

Manufacturing tolerance of the sensor increases overall uncertainty.

## Sony CCD and CMOS sensors

Sony provides relative response curves in their sensor data sheets. To create the absolute QE plots shown in this chapter, the relative response was converted to a normalized QE response and then adjusted as per three measured QE values (at 448 nm, 529 nm, 632 nm) for color sensors and one measured QE value (at 529 nm) for monochrome sensors.

## ON Semi CMOS sensors

The curve in the absolute QE plots shown in this chapter is taken 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.

## Spectral response plots

The curves in the spectral response plots shown in this chapter were calculated from measured quantum efficiencies at 448 nm, 529 nm, and 632 nm. The shape of the curve is taken from the sensor data sheet, but the values have been adjusted based on these measured values.

The uncertainty in measurement of the spectral response values is  $\pm 10$  percent.

## Specifications common to all models

The following table provides specifications common to all Prosilica GT models.

Feature	Specification
Optional lens mount	<ul style="list-style-type: none"> <li>Standard and Extended housing models: C-Mount, CS-Mount, Birger EF-Mount, M42-Mount</li> <li>Large Format models: C-Mount<sup>1</sup>, EF-Mount PA, F-Mount, F-Mount PA, M42-Mount, M42-Mount PA, M58-Mount, M58-Mount PA, TFL-Mount<sup>2</sup></li> </ul>
Default optical filter	<ul style="list-style-type: none"> <li>Monochrome and NIR models: No optical filter</li> <li>Color models: Type IRC30 IR cut filter</li> </ul>
Optional optical filters	<ul style="list-style-type: none"> <li>B 270 ASG protection glass</li> <li>Type IRC30 IR cut filter</li> <li>Type Schneider 486 IR cut filter<sup>3</sup></li> <li>Type RG780 IR pass filter<sup>4</sup></li> <li>Type RG715 IR pass filter<sup>4</sup></li> </ul>
Image buffer	128 MB
TTL (non-isolated) I/O	1 input, 2 outputs
Opto-isolated I/O	1 input, 2 outputs
RS232	1 Tx/D, 1 Rx/D
Power requirements	7 to 25 VDC AUX
Power requirements (PoE)	IEEE 802.3at Type 1
Operating humidity	20 to 80% non-condensing
Interface standards	<ul style="list-style-type: none"> <li>IEEE 802.3 1000BASE-T (GigE) and IEEE 802.3at Type 1 (PoE)</li> <li>GigE Vision® Standard V1.2</li> </ul>
Camera control standard	GenICam SFNC V1.2.1

<sup>1</sup> Prosilica GT4400 and GT5400 only.

<sup>2</sup> Prosilica GT4400, GT5400, and GT6400 only.

<sup>3</sup> Type Schneider 486 IR cut filters are available for Large Format models only. For more information, see the Modular Concept.

<sup>4</sup> Type RG780 and RG715 IR pass filters are available for Prosilica GT standard and extended format models only. For more information, see the Modular Concept.

*Table 9: Specifications common to all Prosilica GT models*

## Prosilica GT1290 series

The following table provides model series specifications. The values are valid for Prosilica GT1290 and GT1290C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT1290	Prosilica GT1290C
Sensor model	Sony ICX445ALA	Sony ICX445AQA
Resolution	1280 (H) × 960 (V); 1.2 MP	
Shutter type	Global shutter	
Sensor type	Interline CCD, Progressive Scan	
Sensor format	Type 1/3	
Sensor size	6.0 mm diagonal	
Pixel size	3.75 μm × 3.75 μm	
Housing	Standard format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	33.3 fps	
Maximum image bit depth	12/14 bit	
StreamHoldCapacity	Up to 53 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed, Mono14	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12, BayerRG12Packed
Exposure time control	12 μs to 77.3 s; 1 μs increments	
Gain control	0 to 29 dB; 1 dB increments	
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	
Power consumption	External power: 2.9 W at 12 VDC Power over Ethernet: 3.5 W	
Trigger latency	2 μs	
Trigger jitter	±20 ns	

Table 10: Prosilica GT1290 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT1290	Prosilica GT1290C
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	90 $\mu$ s
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)	
Camera dimensions (L x W x H)	86 x 53.3 x 33 mm	
Mass (typical)	211 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm 1$ °C	

Table 10: Prosilica GT1290 model series specifications (sheet 2 of 2)

## Absolute QE

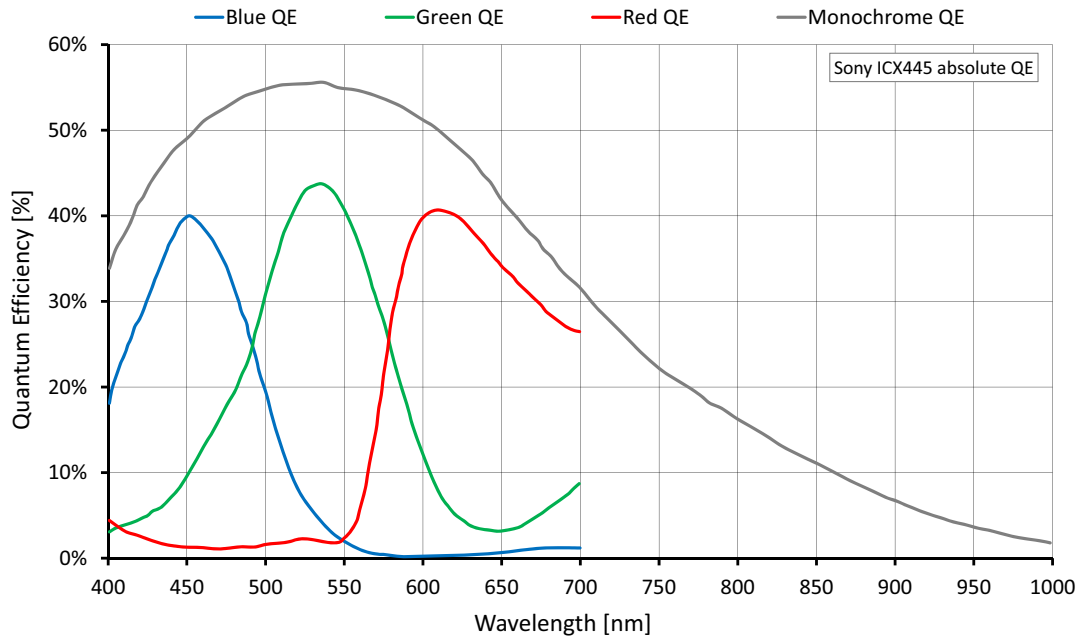


Figure 4: Prosilica GT1290 (Sony ICX445) absolute QE

## Spectral response

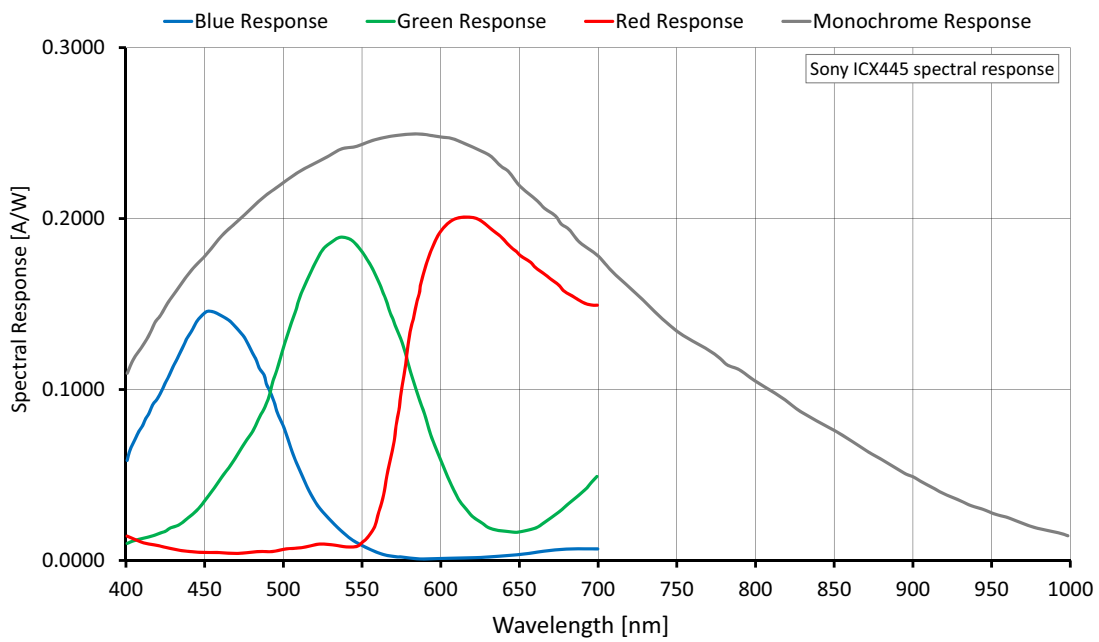


Figure 5: Prosilica GT1290 (Sony ICX445) spectral response

## ROI frame rates

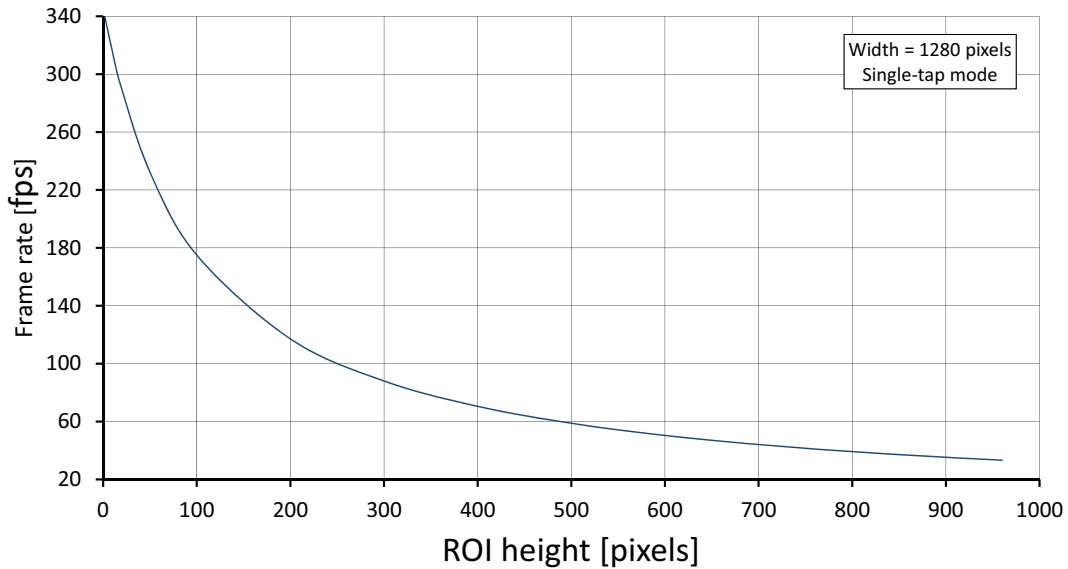


Figure 6: Prosilica GT1290 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
960	33.3	500	58.8	50	232.4
900	35.3	400	70.5	20	289.5
800	39.2	300	88.0	10	315.2
700	44.1	200	117.1	2	339.4
600	50.4	100	175.0		

Table 11: Frame rate as a function of ROI height (Width=1280 pixels)

The following table shows how binning affects ROI frame rates.

BinningVertical	Height	Frame rate	BinningVertical	Height	Frame rate
2	480	60.8	8	120	158.3
3	320	83.8	9	106	168.7
4	240	103.3	10	96	176.9
5	192	120.0	11	86	185.1
6	160	134.5	12	80	191.9
7	136	147.8			

Table 12: Frame rate as a function of ROI height with vertical binning enabled (Width=1280 pixels)

## Prosilica GT1380 series

The following table provides model series specifications. The values are valid for Prosilica GT1380 and GT1380C models. For specifications common to all models, see [Specifications common to all models](#)

Feature	Specification	
	Prosilica GT1380	Prosilica GT1380C
Sensor model	Sony ICX285AL	Sony ICX285AQ
Resolution	1360 (H) × 1024 (V); 1.4 MP	
Shutter type	Global shutter	
Sensor type	Interline CCD, Progressive Scan	
Sensor format	Type 2/3	
Sensor size	11.0 mm diagonal	
Pixel size	6.45 μm × 6.45 μm	
Housing	Standard format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	30.5 fps	
Maximum image bit depth	12/14 bit	
StreamHoldCapacity	Up to 47 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed, Mono14	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12, BayerRG12Packed
Exposure time control	10 μs to 77.3 s; 1 μs increments	
Gain control	0 to 34 dB; 1 dB increments	
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	
Power consumption	External power: 3.4 W at 12 VDC Power over Ethernet: 4.2 W	
Trigger latency	2.2 μs	

Table 13: Prosilica GT1380 model series specifications (sheet 1 of 2)



Feature	Specification	
	Prosilica GT1380	Prosilica GT1380C
Trigger jitter	±20 ns	
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	80 μs
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)	
Camera dimensions (L × W × H)	86 × 53.3 × 33 mm	
Mass (typical)	211 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C	

Table 13: Prosilica GT1380 model series specifications (sheet 2 of 2)

## Absolute QE

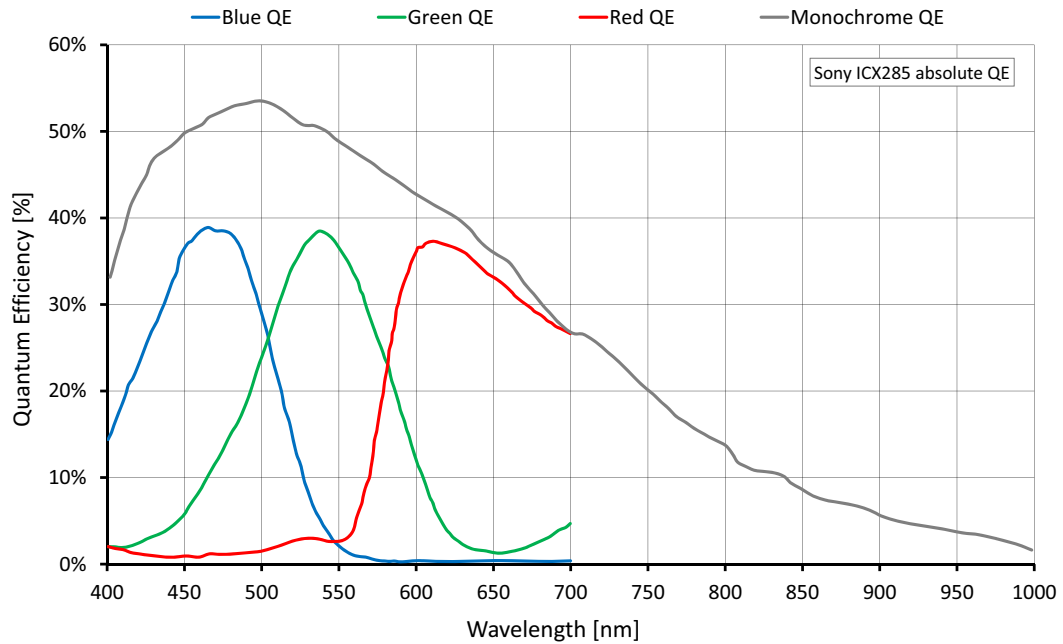


Figure 7: Prosilica GT1380 (Sony ICX285) absolute QE

## Spectral response

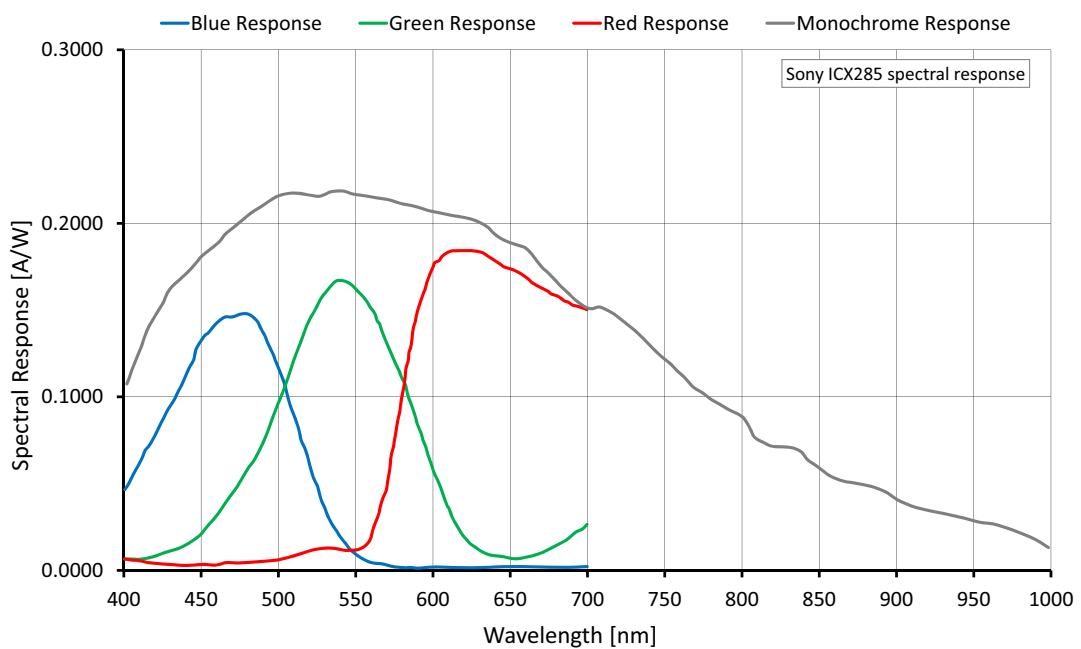


Figure 8: Prosilica GT1380 (Sony ICX285) spectral response

## ROI frame rates

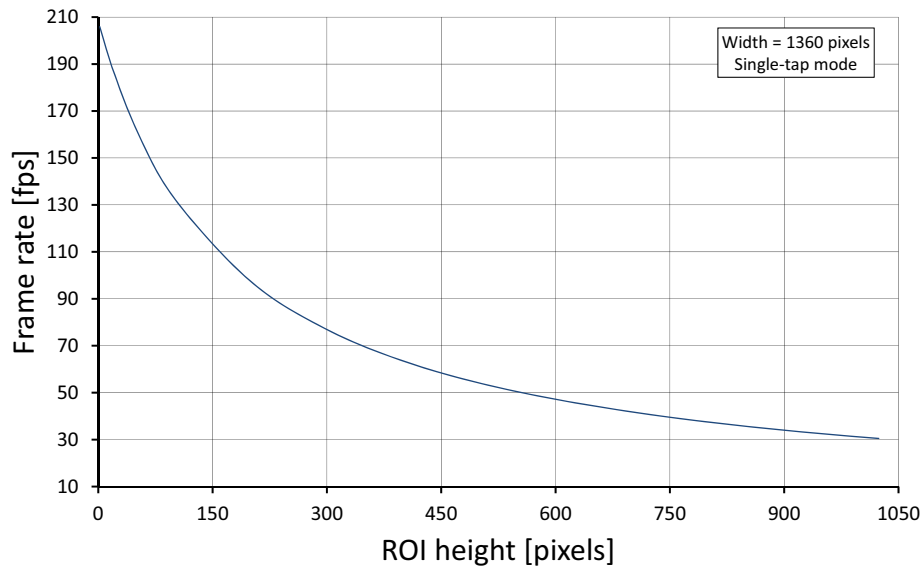


Figure 9: Prosilica GT1380 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
1024	30.5	600	47.2	100	132.7
1000	31.1	500	54.1	50	162.1
900	34.0	400	63.5	20	186.9
800	37.5	300	76.9	10	197.0
700	41.8	200	97.4	2	205.9

Table 14: Frame rate as a function of ROI height (Width=1360 pixels)

The following table shows how binning affects ROI frame rates.

BinningVertical	Height	Frame rate	BinningVertical	Height	Frame rate
2	512	53.2	9	113	125.6
3	341	70.7	10	102	130.4
4	256	84.6	11	93	134.6
5	204	96.0	12	85	138.5
6	170	105.4	13	78	142.1
7	146	113.1	14	73	144.7
8	128	119.6			

Table 15: Frame rate as a function of ROI height with vertical binning enabled (Width=1360 pixels)

## Prosilica GT1600 series

The following table provides model series specifications. The values are valid for Prosilica GT1600 and GT1600C models. For specifications common to all models, see [Specifications common to all models](#)

Feature	Specification	
	Prosilica GT1600	Prosilica GT1600C
Sensor model	Sony ICX274AL	Sony ICX274AQ
Resolution	1620 (H) × 1220 (V); 2 MP	
Shutter type	Global shutter	
Sensor type	Interline CCD, Progressive Scan	
Sensor format	Type 1/1.8	
Sensor size	8.923 mm diagonal	
Pixel size	4.4 μm × 4.4 μm	
Housing	Standard format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	25.8 fps	
Maximum image bit depth	12/14 bit	
StreamHoldCapacity	Up to 33 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed, Mono14	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12, BayerRG12Packed
Exposure time control	10 μs to 68.7 s, 1 μs increments	
Gain control	0 to 26 dB; 1 dB increments	
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	
Power consumption	External power: 3.3 W at 12 VDC Power over Ethernet: 4.0 W	
Trigger latency	1.4 μs	
Trigger jitter	±20 ns	

Table 16: Prosilica GT1600 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT1600	Prosilica GT1600C
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	64 $\mu$ s
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)	
Camera dimensions (L x W x H)	86 x 53.3 x 33 mm	
Mass (typical)	211 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm 1$ °C	

Table 16: Prosilica GT1600 model series specifications (sheet 2 of 2)

## Absolute QE

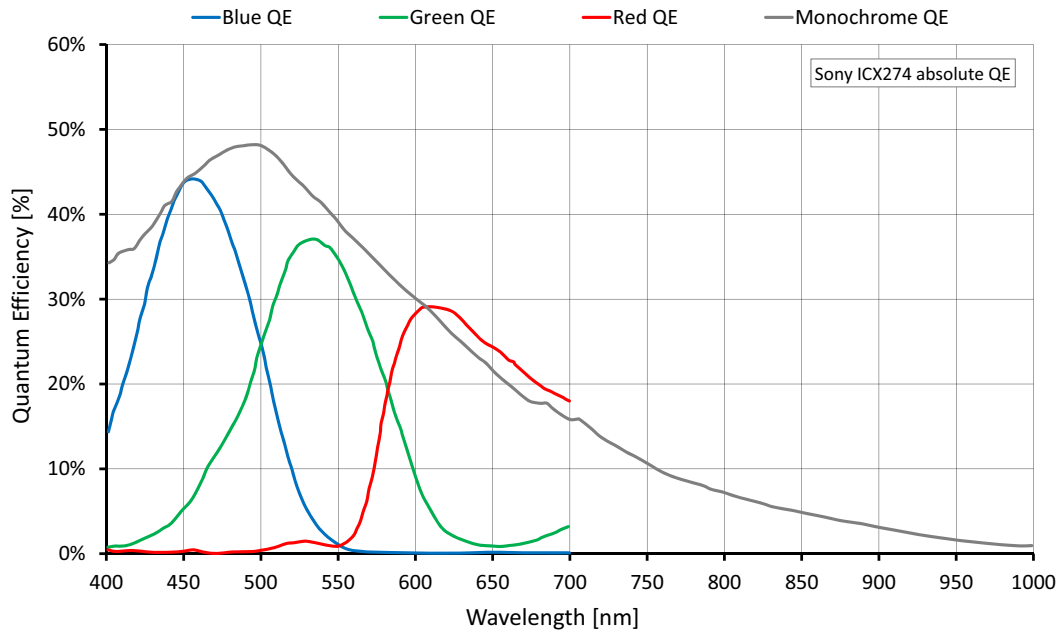


Figure 10: Prosilica GT1600 (Sony ICX274) absolute QE

## Spectral response

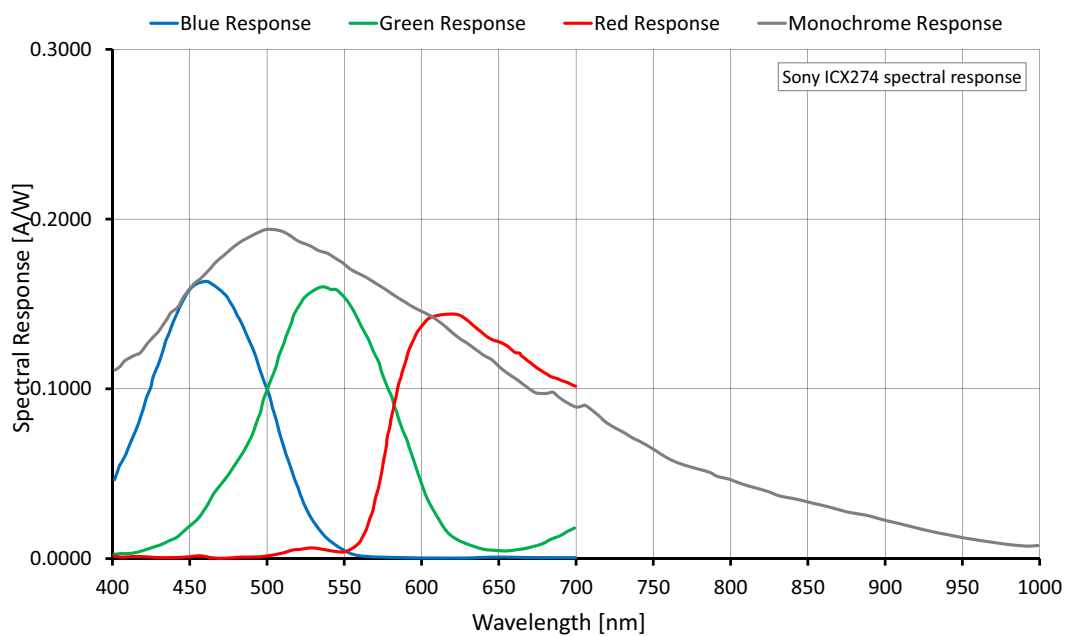


Figure 11: Prosilica GT1600 (Sony ICX274) spectral response

## ROI frame rates

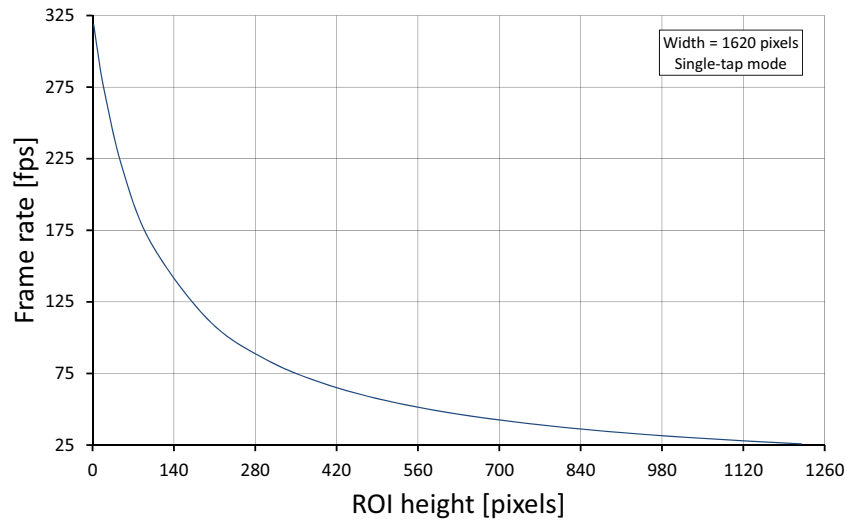


Figure 12: Prosilica GT1600 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
1220	25.8	600	48.5	50	220.2
1100	28.4	500	56.5	20	272.9
1000	31.0	400	67.7	10	296.5
900	34.0	300	84.4	2	318.6
800	37.8	200	112.1		
700	42.5	100	116.6		

Table 17: Frame rate as a function of ROI height (Width=1620 pixels)

The following table shows how binning affects ROI frame rates.

BinningVertical	Height	Frame rate	BinningVertical	Height	Frame rate
2	610	47.9	9	134	142.2
3	406	66.9	10	122	149.6
4	304	83.5	11	110	157.7
5	244	97.8	12	100	165.2
6	202	111.0	13	92	171.7
7	174	122.1	14	86	176.9
8	152	132.4			

Table 18: Frame rate as a function of ROI height with vertical binning enabled (Width=1620 pixels)

## Prosilica GT1920 series

The following table provides model series specifications. The values are valid for Prosilica GT1920 and GT1920C models. For specifications common to all models, see [Specifications common to all models](#)

Feature	Specification	
	Prosilica GT1920	Prosilica GT1920
Sensor model	Sony ICX674ALG	Sony ICX674AQG
Resolution	1936 (H) × 1456 (V); 2.8 MP	
Shutter type	Global shutter	
Sensor type	Interline CCD, Progressive Scan	
Sensor format	Type 2/3	
Sensor size	10.972 mm diagonal	
Pixel size	4.54 μm × 4.54 μm	
Housing	Extended format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	Quad-tap mode: 40.7 fps Single-tap mode: 11.6 fps	
Maximum image bit depth	12/14 bit	
StreamHoldCapacity	Up to 47 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed, Mono14	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW pixel formats	Not applicable	BayerGR8, BayerGR12, BayerRG12Packed
Exposure time control	10 μs to 26.8 s, 1 μs increments	
Gain control	0 to 33 dB; 1 dB increments	
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	
Power consumption	External power: 4.9 W at 12 VDC Power over Ethernet: 6.0 W	

Table 19: Prosilica GT1920 model series specifications (sheet 1 of 2)



Feature	Specification	
	Prosilica GT1920	Prosilica GT1920
Trigger latency	2 $\mu$ s	
Trigger jitter	$\pm$ 20 ns	
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	52 $\mu$ s
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)	
Camera dimensions (L x W x H)	92 x 53.3 x 33 mm	
Mass (typical)	224 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm$ 1 °C	

Table 19: Prosilica GT1920 model series specifications (sheet 2 of 2)

## Absolute QE

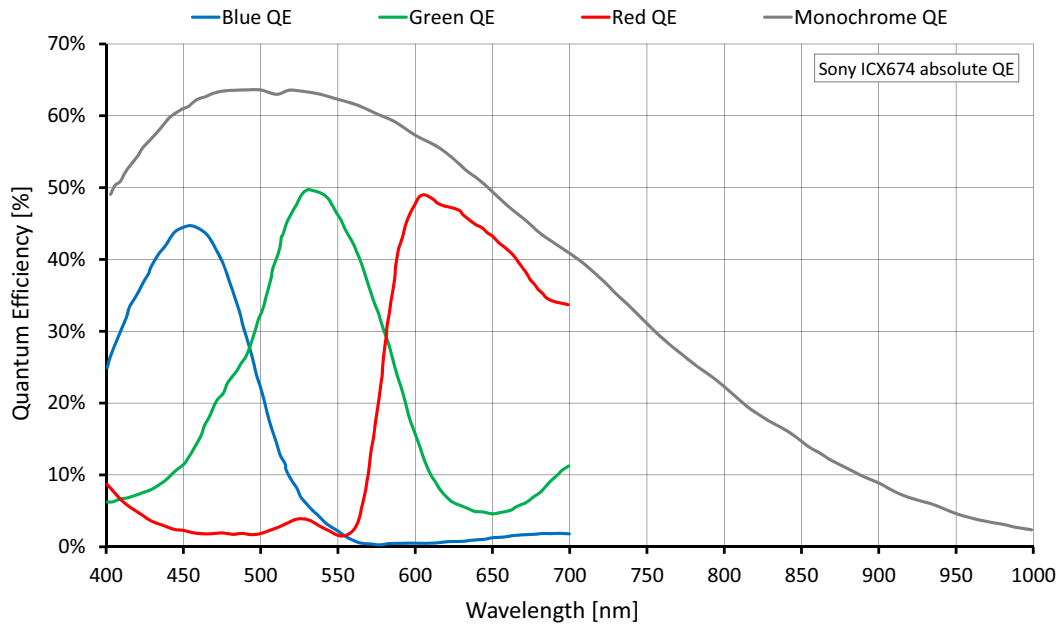


Figure 13: Prosilica GT1920 (Sony ICX674) absolute QE

## Spectral response

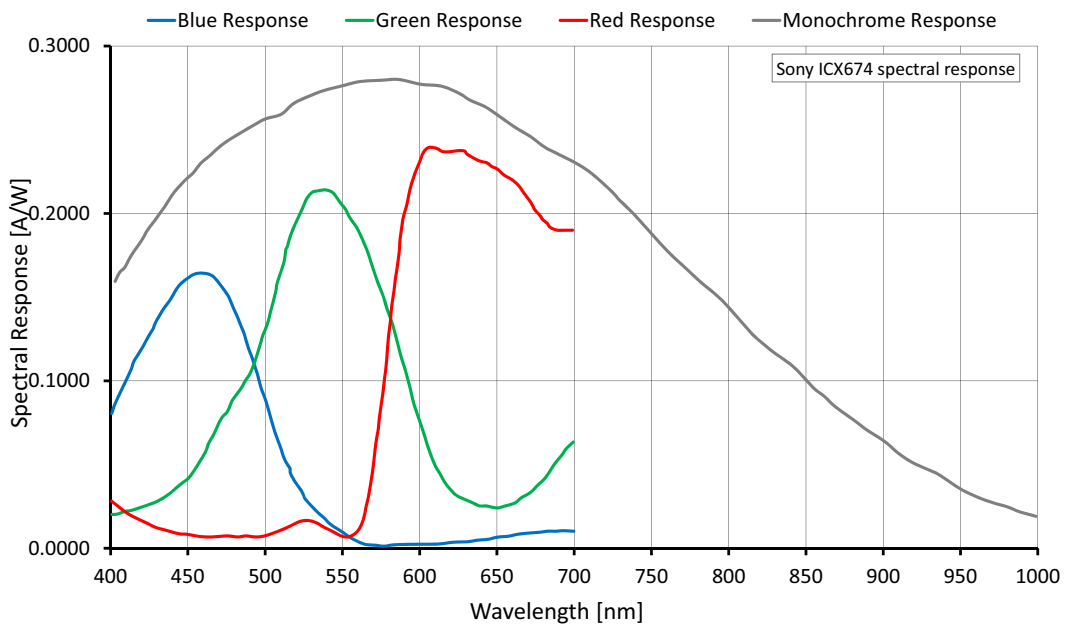


Figure 14: Prosilica GT1920 (Sony ICX674) spectral response

## ROI frame rates

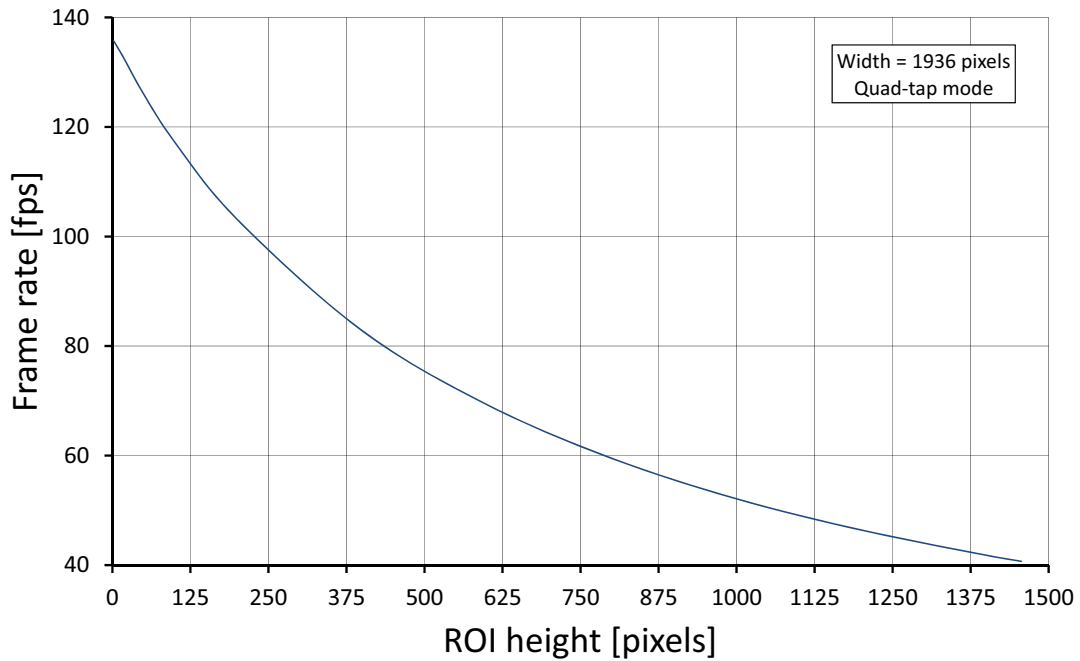


Figure 15: Prosilica GT1920 frame rate as function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
1456	40.7	600	69.3	20	132.2
1400	41.8	400	82.8	10	134.2
1200	46.4	200	103.1	2	135.7
1000	52.1	100	117.2		
800	59.5	50	126.0		

Table 20: Frame rate as a function of ROI height (Width=1936 pixels)

The following table shows how binning affects ROI frame rates.

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

Table 21: Frame rate as a function of ROI height with vertical binning enabled (Width=1936 pixels)

## Prosilica GT1930 series

The following table provides model series specifications. The values are valid for Prosilica GT1930 and GT1930C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT1930	Prosilica GT1930C
Sensor model	Sony IMX174LLJ	Sony IMX174LQJ
Resolution	1936 (H) × 1216 (V); 2.35 MP	
Shutter type	Pregius® global shutter	
Sensor type	CMOS	
Sensor format	Type 1/1.2	
Sensor size	13.4 mm diagonal	
Pixel size	5.86 μm × 5.86 μm	
CRA <sup>1</sup>	0.0 degrees	
Housing <sup>2</sup>	Standard format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	50.8 fps (59.2 fps burst mode)	
Maximum image bit depth	12-bit	
StreamHoldCapacity	Up to 56 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12,
Exposure time control	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	27 μs to 85.9 s; 13.44 μs increments
	Mono12, BayerRG12, YUV422Packed	31 μs to 85.9 s; 17.92 μs increments
Gain control	YUV444Packed, RGB8Packed, BGR8Packed	40 μs to 85.9 s; 26.88 μs increments
	0.0 to 40.0 dB, 0.1 dB increments	

Table 22: Prosilica GT1930 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT1930	Prosilica GT1930C
Binning	Horizontal: 1 to 4 pixels Vertical: 1 to 4 rows	
Decimation X/Y	Horizontal and vertical: 1, 2, 4, 8 factor	
Power consumption	External power: 3.4 W at 12 VDC Power over Ethernet: 4.2 W	
Trigger latency	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	40.32 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	53.76 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	80.64 $\mu$ s
Trigger jitter	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	$\pm$ 6.72 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	$\pm$ 8.96 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	$\pm$ 13.44 $\mu$ s
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	188 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	256 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	390 $\mu$ s
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)	
Camera dimensions (L x W x H)	86 x 53 x 33 mm	
Mass (typical)	211 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm$ 1 °C	
<sup>1</sup> For more information on CRA, contact Allied Vision support.		
<sup>2</sup> The Prosilica GT1930 housing lens protrusion is 2.3 mm shorter than other standard housings.		

Table 22: Prosilica GT1930 model series specifications (sheet 2 of 2)

## Absolute QE

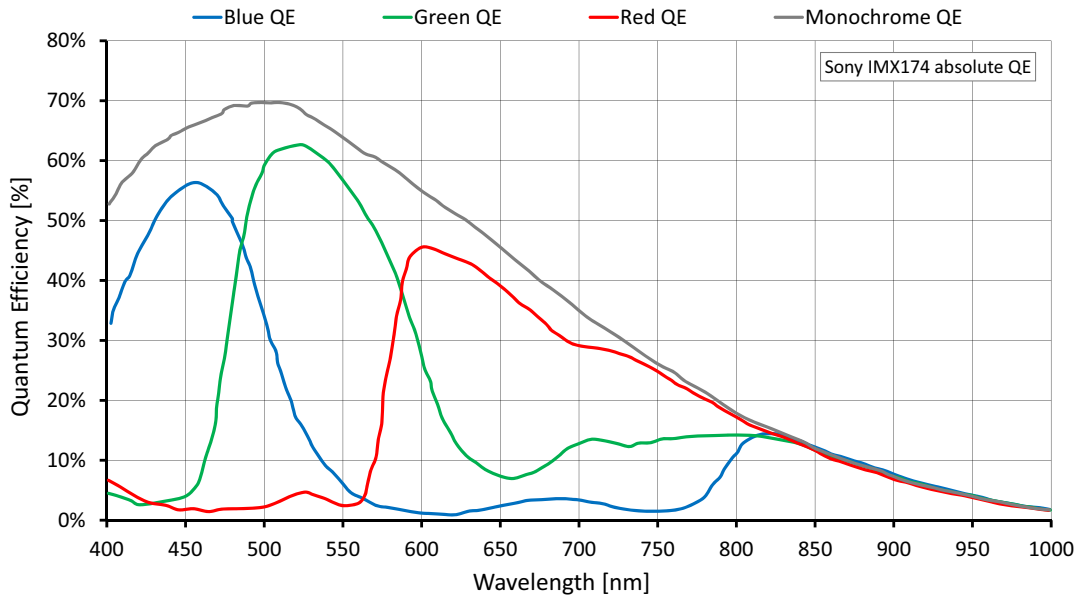


Figure 16: Prosilica GT1930 (Sony IMX174) absolute QE

## Spectral response

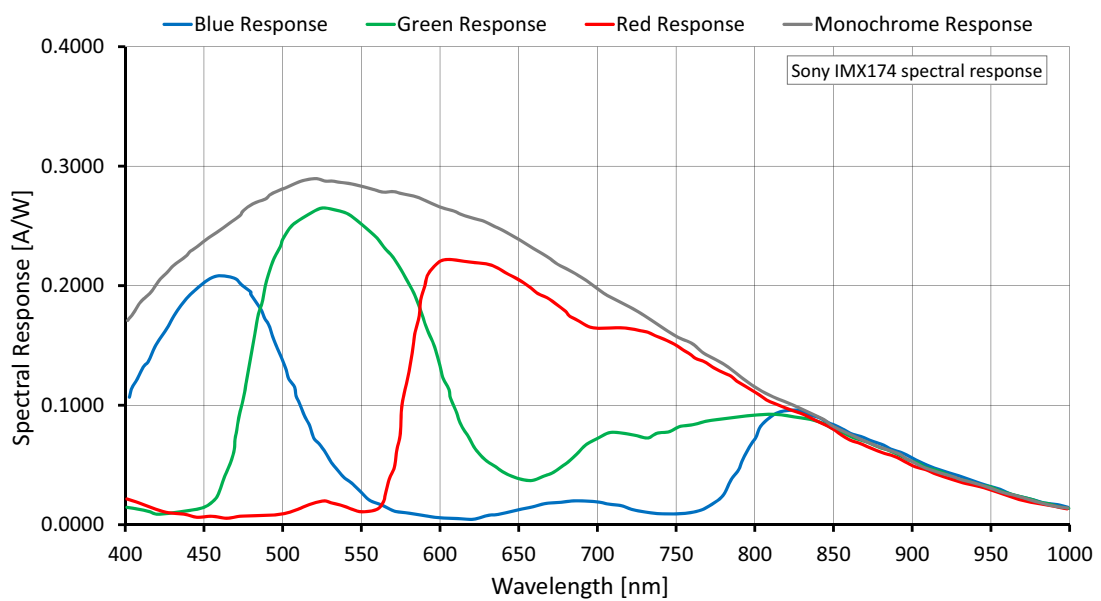


Figure 17: Prosilica GT1930 (Sony IMX174) spectral response

## ROI frame rates

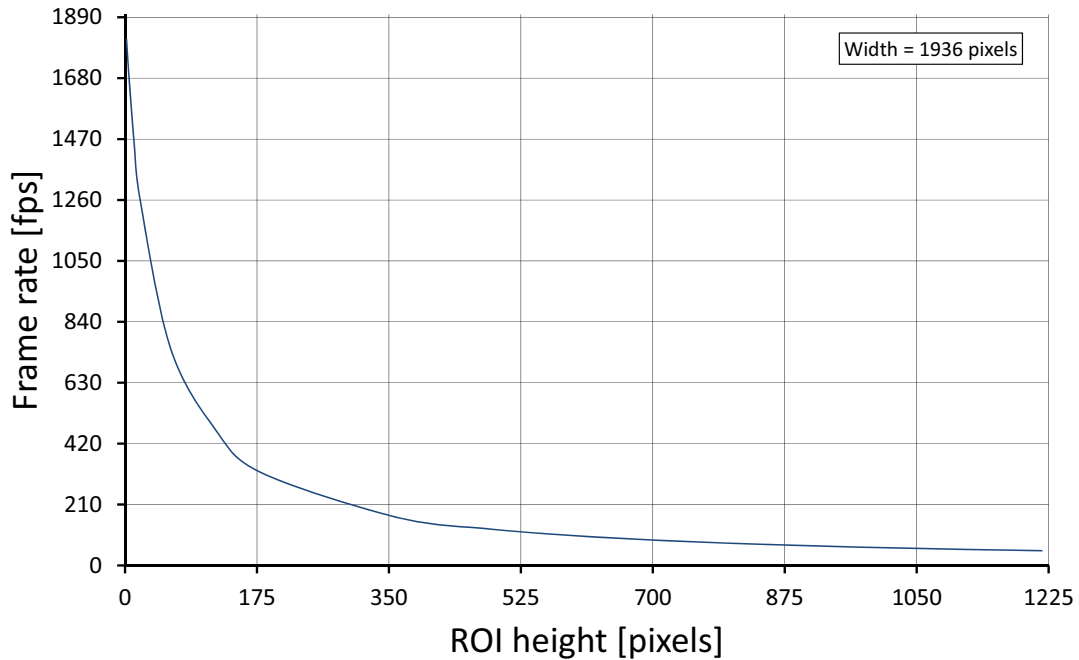


Figure 18: Prosilica GT1930 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
1216	50.8	600	102.0	60	751.5
1080	57.0	480	126.5	20	1261.0
1024	60.1	360	166.4	12	1458.8
960	64.2	180	320.7	4	1730.1
768	79.8	120	467.9	2	1814.5

Table 23: Frame rate as a function of ROI height (Width=1936 pixels)



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

## Prosilica GT1930L series

The following table provides model series specifications. The values are valid for Prosilica GT1930L and GT1930LC models. For specifications common to all models, see [Specifications common to all models](#)

Feature	Specification	
	Prosilica GT1930L	Prosilica GT1930LC
Sensor model	Sony IMX174LLJ	Sony IMX174LQJ
Resolution	1936 (H) × 1216 (V); 2.35 MP	
Shutter type	Pregius® global shutter	
Sensor type	CMOS	
Sensor format	Type 1/1.2	
Sensor size	13.4 mm diagonal	
Pixel size	5.86 μm × 5.86 μm	
CRA <sup>1</sup>	0.0 degrees	
Housing	Large Format housing	
Default lens mount	EF-Mount PA	
Maximum frame rate at full resolution	50.8 fps (59.2 fps burst mode)	
Maximum image bit depth	12-bit	
StreamHoldCapacity	Up to 56 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12, BayerRG12Packed
Exposure time control	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	27 μs to 85.9 s; 13.44 μs increments
	Mono12, BayerRG12, YUV422Packed	31 μs to 85.9 s; 17.92 μs increments
	YUV444Packed, RGB8Packed, BGR8Packed	40 μs to 85.9 s; 26.88 μs increments
Gain control	0.0 to 40.0 dB, 0.1 dB increments	
Binning	Horizontal: 1 to 4 pixels; Vertical: 1 to 4 rows	

Table 24: Prosilica GT1930L model series specifications (sheet 1 of 2)



Feature	Specification	
	Prosilica GT1930L	Prosilica GT1930LC
Decimation X/Y	Horizontal and vertical: 1, 2, 4, 8 factor	
Power consumption	External power: 3.24 W at 12 VDC Power over Ethernet: 3.88 W	
Trigger latency	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	40.32 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	53.76 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	80.64 $\mu$ s
Trigger jitter	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	$\pm$ 6.72 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	$\pm$ 8.96 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	$\pm$ 13.44 $\mu$ s
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	188 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	256 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	390 $\mu$ s
Propagation delay ( $t_{pd}$ )	30 ns for non-isolated I/O; 70 ns for isolated I/O	
Operating temperature <sup>2</sup>	-30 to +75 °C DeviceTemperatureSelector = <i>Sensor</i> , -30 to +80 °C DeviceTemperatureSelector = <i>Main</i> , -30 to +70 °C housing temperature (without condensation), -30 to +65 °C ambient temperature (without condensation)	
Storage temperature	-40 °C to +80 °C ambient temperature (without condensation)	
Camera dimensions (L x W x H)	96 x 66 x 53.3 mm	
Mass (typical)	372 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm$ 1 °C	
<sup>1</sup> For more information on CRA, contact Allied Vision support.		
<sup>2</sup> Selects the site which temperature is reported. For more information on DeviceStatus, see the GigE Features Reference.		

Table 24: Prosilica GT1930L model series specifications (sheet 2 of 2)

## Absolute QE

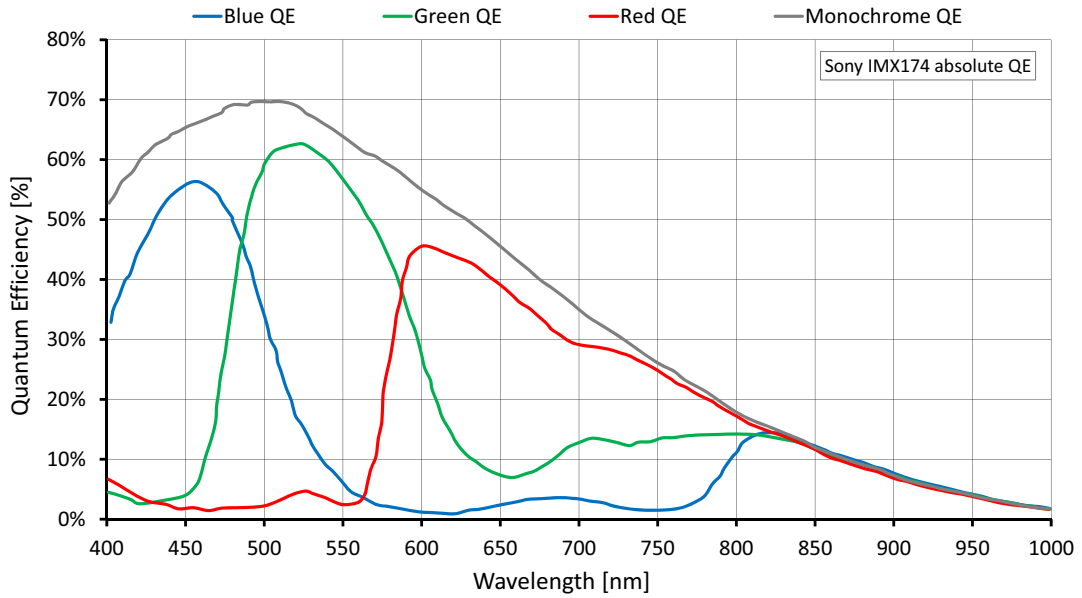


Figure 19: Prosilica GT1930L (Sony IMX174) absolute QE

## Spectral response

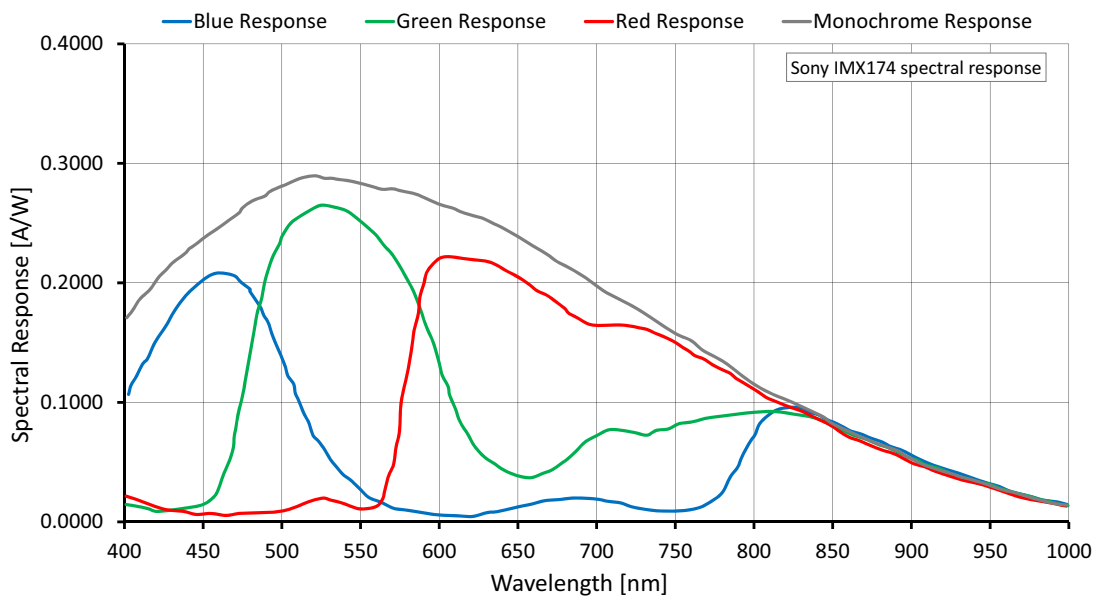


Figure 20: Prosilica GT1930L (Sony IMX174) spectral response

## ROI frame rates

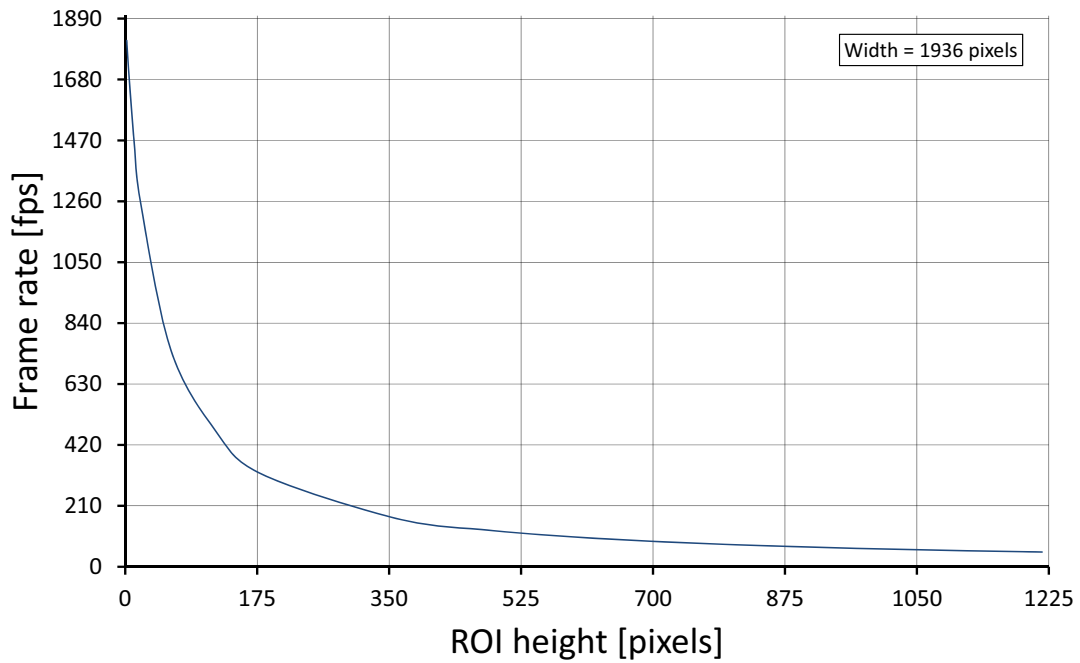


Figure 21: Prosilica GT1930L frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
1216	50.8	600	102.0	60	751.5
1080	57.0	480	126.5	20	1261.0
1024	60.1	360	166.4	12	1458.8
960	64.2	180	320.7	4	1730.1
768	79.8	120	467.9	2	1814.5

Table 25: Frame rate as a function of ROI height (Width=1936 pixels)



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

## Prosilica GT2000 series

The following table provides model series specifications. The values are valid for Prosilica GT2000, GT2000NIR, and GT2000C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT2000, GT2000NIR	Prosilica GT2000C
Sensor model	CMOSIS/ams CMV2000	
Resolution	2048 (H) × 1088 (V); 2.2 MP	
Shutter type	Global shutter	
Sensor type	CMOS	
Sensor format	Type 2/3	
Sensor size	12.7 mm diagonal	
Pixel size	5.5 μm × 5.5 μm	
Housing <sup>1</sup>	Standard format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	53.7 fps (60.1 fps burst mode)	
Maximum image bit depth	12-bit	
StreamHoldCapacity	Up to 29 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW pixel formats	Not applicable	BayerGB8, BayerGB12, BayerGB12Packed
Exposure time control <sup>2</sup>	25 μs to 122 s, 1 μs increments	
Gain control	0 to 26 dB; 1 dB increments	
Decimation X/Y	Horizontal and vertical: 1, 2, 4, 8 factor	
Power consumption	External power: 3.4 W at 12 VDC Power over Ethernet: 4.2 W	
Trigger latency	700 ns	
Trigger jitter	±20 ns	

Table 26: Prosilica GT2000 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT2000, GT2000NIR	Prosilica GT2000C
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerGB8, Mono12Packed, BayerGB12Packed, YUV411Packed	76 $\mu$ s
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)	
Camera dimensions (L x W x H)	86 x 53.3 x 33 mm	
Mass (typical)	210 g	
Temperature monitoring	Available for main board only. Resolution: 0.031; Accuracy: $\pm 1$ °C	
<sup>1</sup> 1 inch format lens recommended		
<sup>2</sup> Camera firmware version 01.52.8151 shows minimum exposure values without frame overhead time, that is, 1 $\mu$ s. See the sensor data sheet for details on frame overhead time.		

Table 26: Prosilica GT2000 model series specifications (sheet 2 of 2)

## Absolute QE

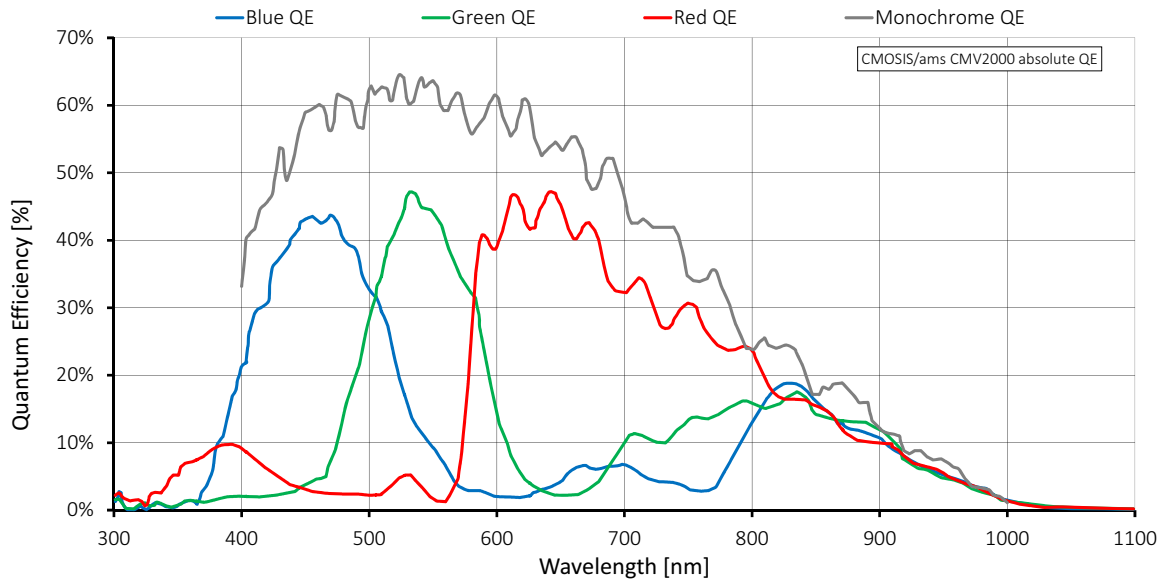


Figure 22: Prosilica GT2000 and GT2000C (CMOSIS/ams CMV2000) absolute QE

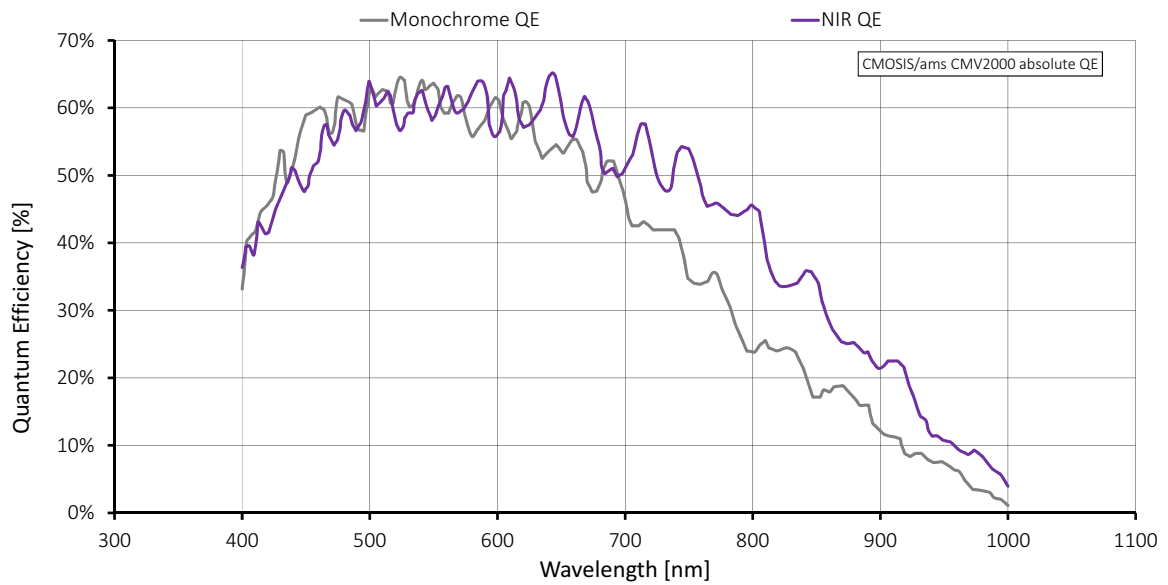


Figure 23: Prosilica GT2000NIR (CMOSIS/ams CMV2000 NIR) absolute QE

## Spectral response

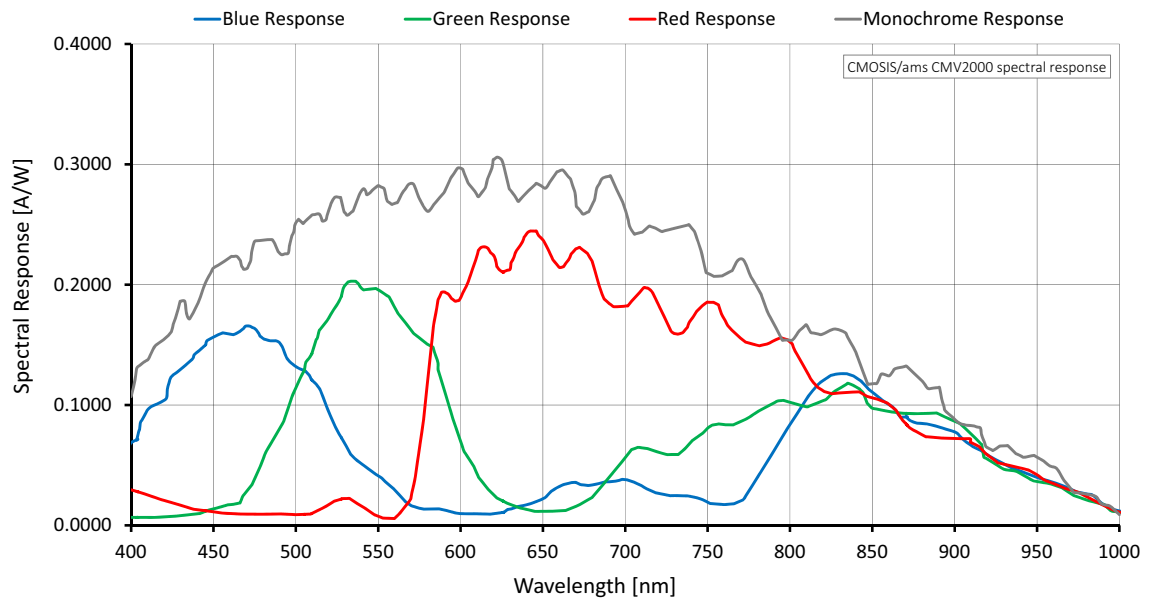


Figure 24: Prosilica GT2000 and GT2000C (CMOSIS/ams CMV2000) spectral response

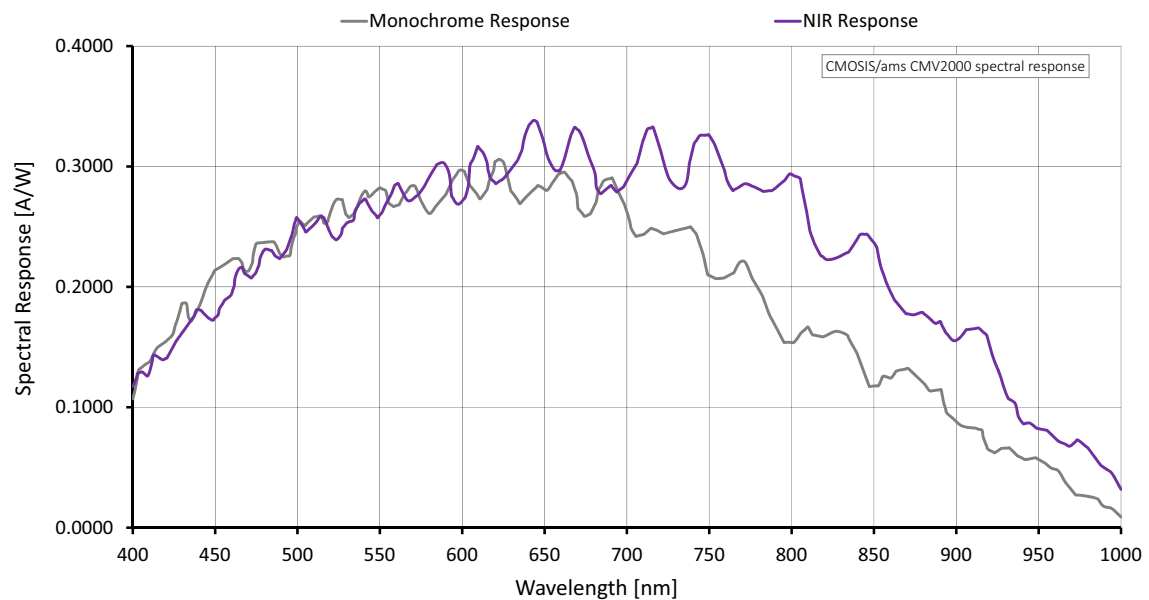


Figure 25: Prosilica GT2000NIR (CMOSIS/ams CMV2000 NIR) spectral response

## ROI frame rates

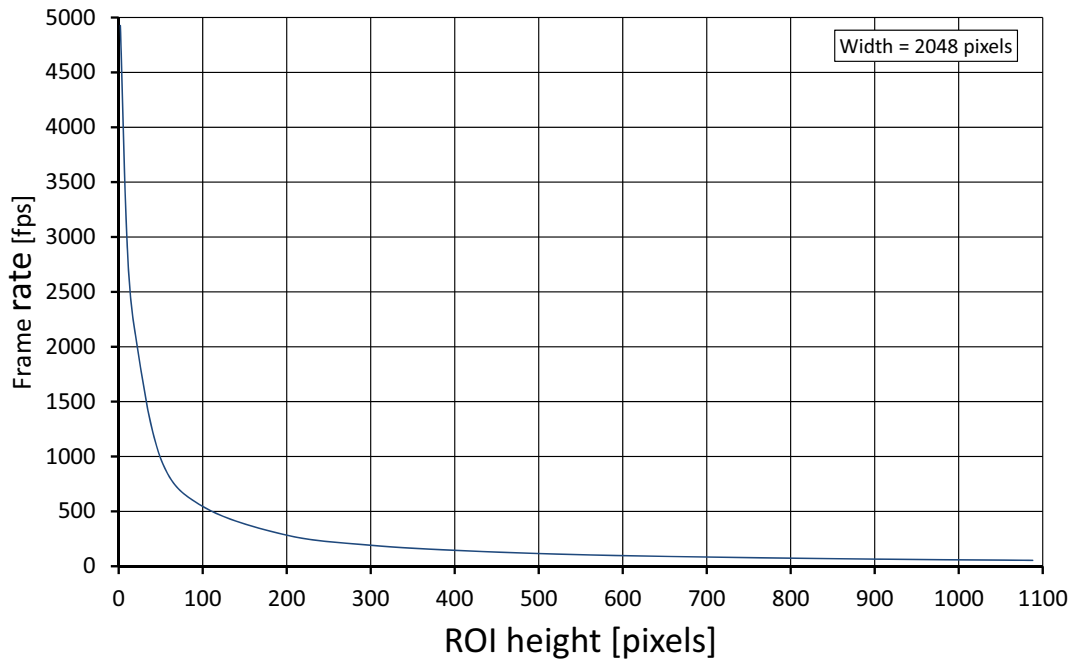


Figure 26: Prosilica GT2000 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
1088	53.7	600	96.8	100	545.3
1000	58.4	500	115.9	50	981.4
900	64.8	400	144.3	20	2105.3
800	72.9	300	191.2	10	2949.9
700	83.2	200	283.1	2	4926.1

Table 27: Frame rate as a function of ROI height



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



## Prosilica GT2050 series

The following table provides model series specifications. The values are valid for Prosilica GT2050, GT2050NIR, and GT2050C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT2050, GT2050NIR	Prosilica GT2050C
Sensor model	CMOSIS/ams CMV4000	
Resolution	2048 (H) × 2048 (V); 4.2 MP	
Shutter type	Global shutter	
Sensor type	CMOS	
Sensor format	Type 1	
Sensor size	16.0 mm diagonal	
Pixel size	5.5 μm × 5.5 μm	
Housing	Standard format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	28.6 fps (32.0 burst mode)	
Maximum image bit depth	12-bit	
StreamHoldCapacity	Up to 15 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW pixel formats	Not applicable	BayerGB8, BayerGB12, BayerGB12Packed
Exposure time control <sup>1</sup>	50 μs to 126.2 s, 1 μs increments	
Gain control	0 to 26 dB; 1 dB increments	
Decimation X/Y	Horizontal and vertical: 1, 2, 4, 8 factor	
Power consumption	External power: 3.5 W at 12 VDC Power over Ethernet: 4.3 W	
Trigger latency	700 ns	
Trigger jitter	±20 ns	

Table 28: Prosilica GT2050 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT2050, GT2050NIR	Prosilica GT2050C
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerGB8, Mono12Packed, BayerGB12Packed, YUV411Packed	116 $\mu$ s
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)	
Camera dimensions (L x W x H)	86 x 53.3 x 33 mm	
Mass (typical)	210 g	
Temperature monitoring	Available for main board only. Resolution: 0.031; Accuracy: $\pm 1$ °C	
<sup>1</sup> Camera firmware version $\leq$ 01.52.8151 shows minimum exposure values without frame overhead time, that is, 1 $\mu$ s. See the sensor data sheet for details on frame overhead time.		

Table 28: Prosilica GT2050 model series specifications (sheet 2 of 2)

## Absolute QE

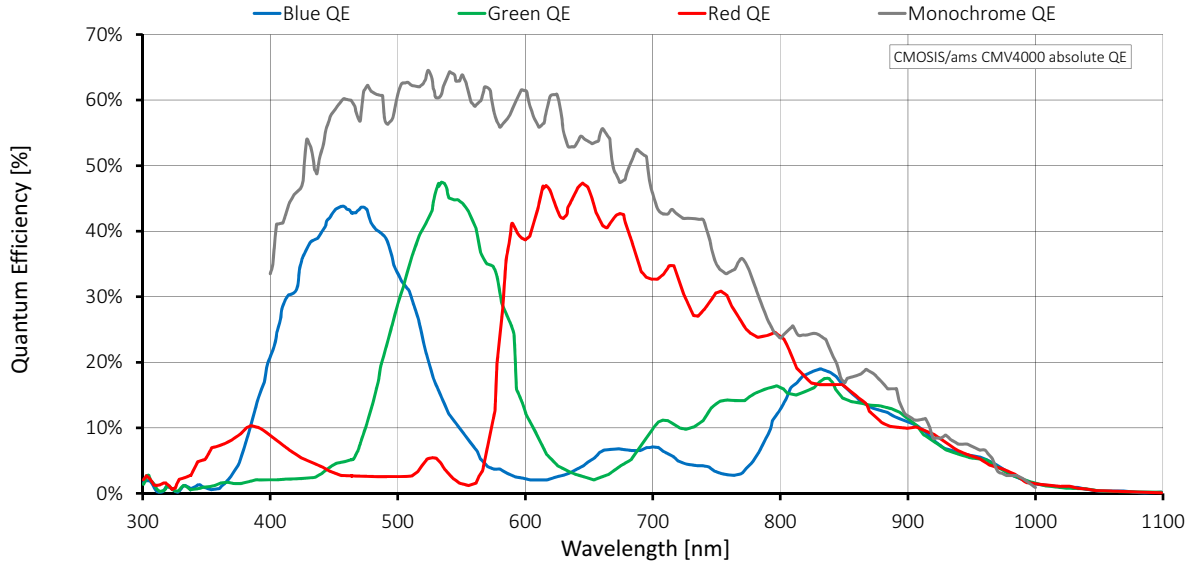


Figure 27: Prosilica GT2050 (CMOSIS/ams CMV4000) absolute QE

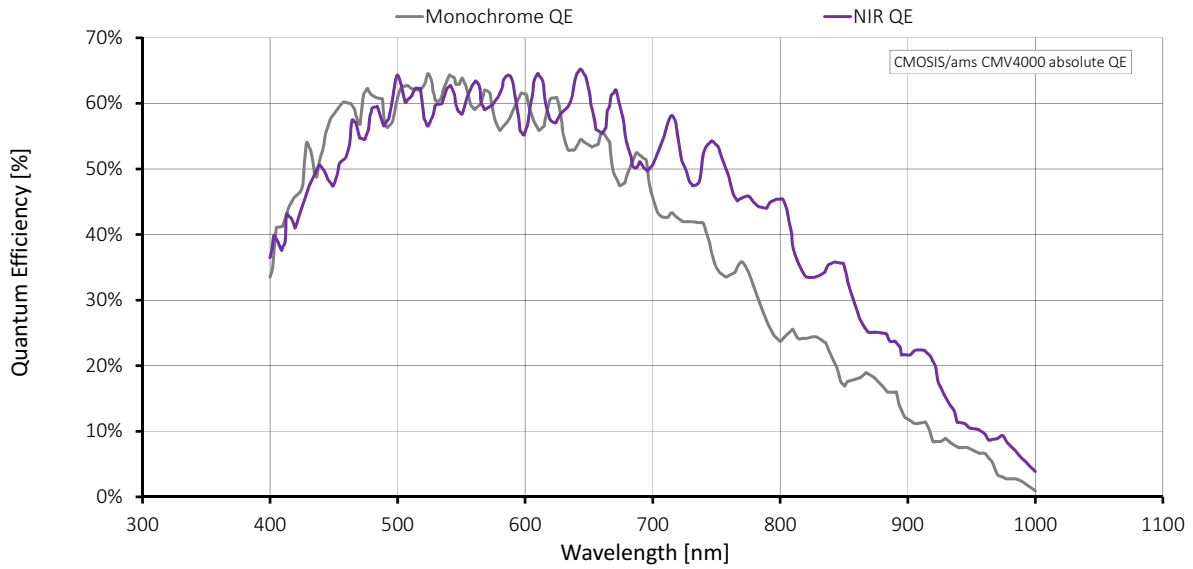


Figure 28: Prosilica GT2050NIR (CMOSIS/ams CMV4000 NIR) absolute QE

## Spectral response

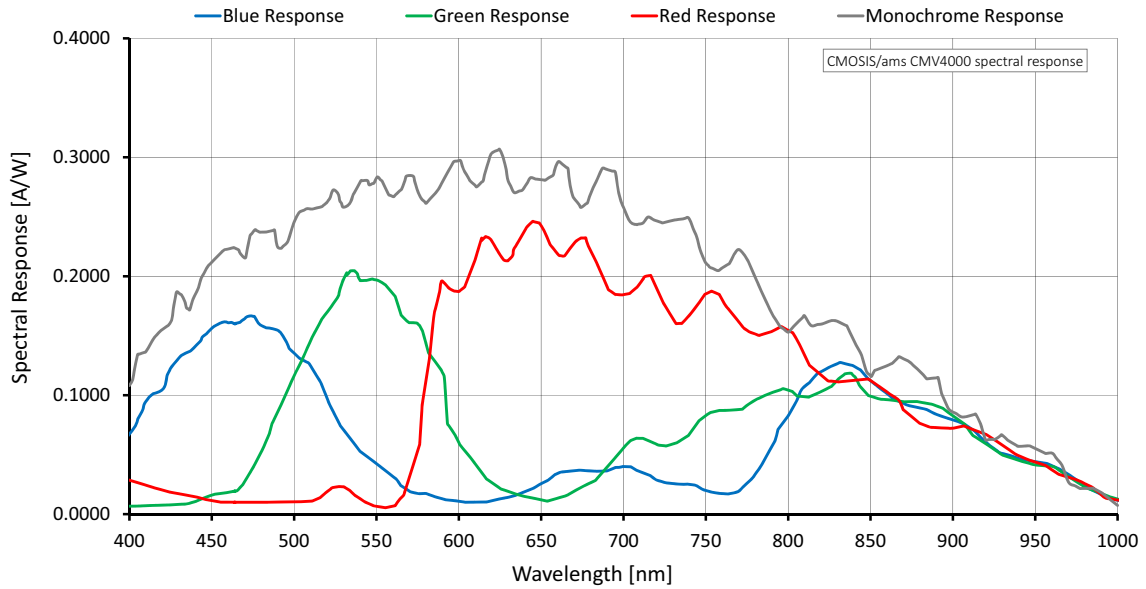


Figure 29: Prosilica GT2050 (CMOSIS/ams CMV4000) spectral response

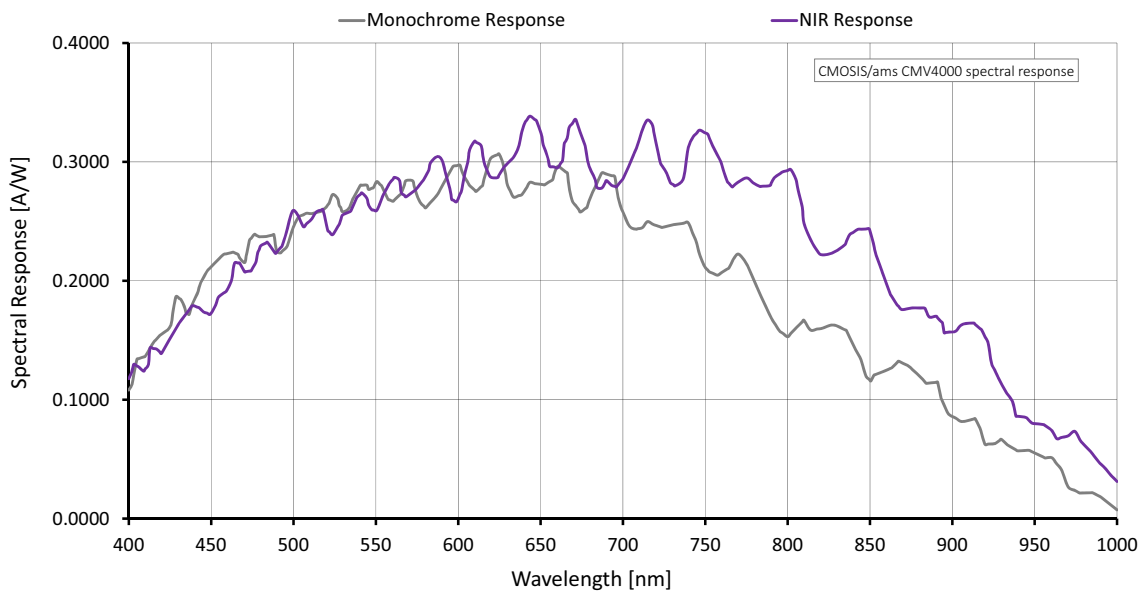


Figure 30: Prosilica GT2050NIR (CMOSIS/ams CMV4000 NIR) spectral response

## ROI frame rates

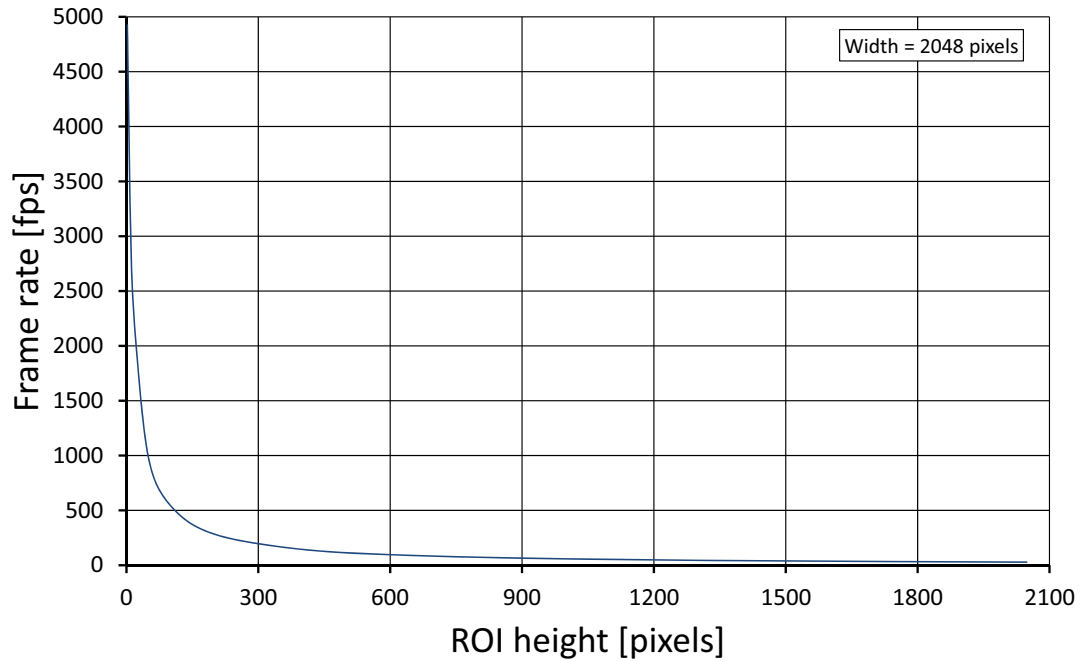


Figure 31: Prosilica GT2050 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
2048	28.6	1000	58.4	50	981.4
2000	29.3	800	72.9	20	2105.3
1800	32.6	600	96.8	10	2949.9
1600	36.6	400	144.3	2	4926.1
1400	41.8	200	283.1		
1200	48.7	100	545.3		

Table 29: Frame rate as a function of ROI height (Width=2048 pixels)



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

## Prosilica GT2450 series

The following table provides model series specifications. The values are valid for Prosilica GT2450 and GT2450C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT2450	Prosilica GT2450C
Sensor model	Sony ICX625ALA	Sony ICX625AQA
Resolution	2448 (H) × 2050 (V); 5 MP	
Shutter type	Global shutter	
Sensor type	Interline CCD, Progressive Scan	
Sensor format	Type 2/3	
Sensor size	11.016 mm diagonal	
Pixel size	3.45 μm × 3.45 μm	
Housing	Standard format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	15 fps	
Maximum image bit depth	12/14 bit	
StreamHoldCapacity	Up to 13 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed, Mono14	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12, BayerRG12Packed
Exposure time control	25 μs to 42.9 s, 1 μs increments	
Gain control	0 to 30 dB; 1 dB increments	
Binning	Horizontal: 1 to 8 columns; Vertical: 1 to 14 rows	
Decimation X/Y	Horizontal and vertical: 1, 2, 4, 8 factor	
Sensor taps	Dual-tap	
Power consumption	External power: 3.8 W at 12 VDC Power over Ethernet: 4.7 W	
Trigger latency	1.1 μs	

Table 30: Prosilica GT2450 specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT2450	Prosilica GT2450C
Trigger jitter	±20 ns	
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	24.8 μs
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)	
Camera dimensions (L × W × H)	86 × 53.3 × 33 mm	
Mass (typical)	211 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C	

Table 30: Prosilica GT2450 specifications (sheet 2 of 2)

## Absolute QE

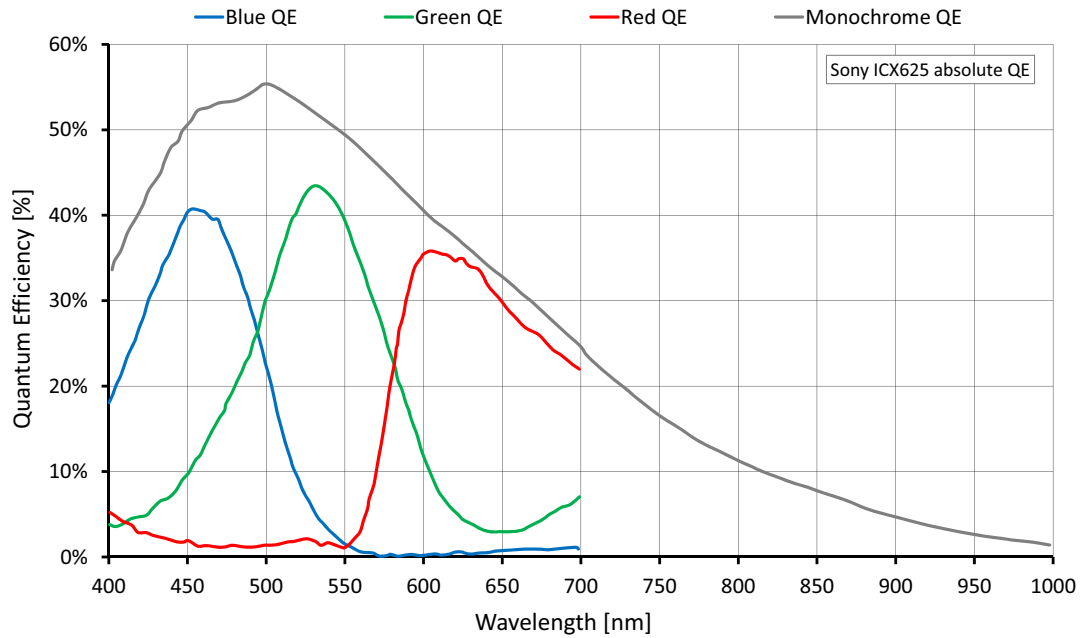


Figure 32: Prosilica GT2450 (Sony ICX625) absolute QE

## Spectral response

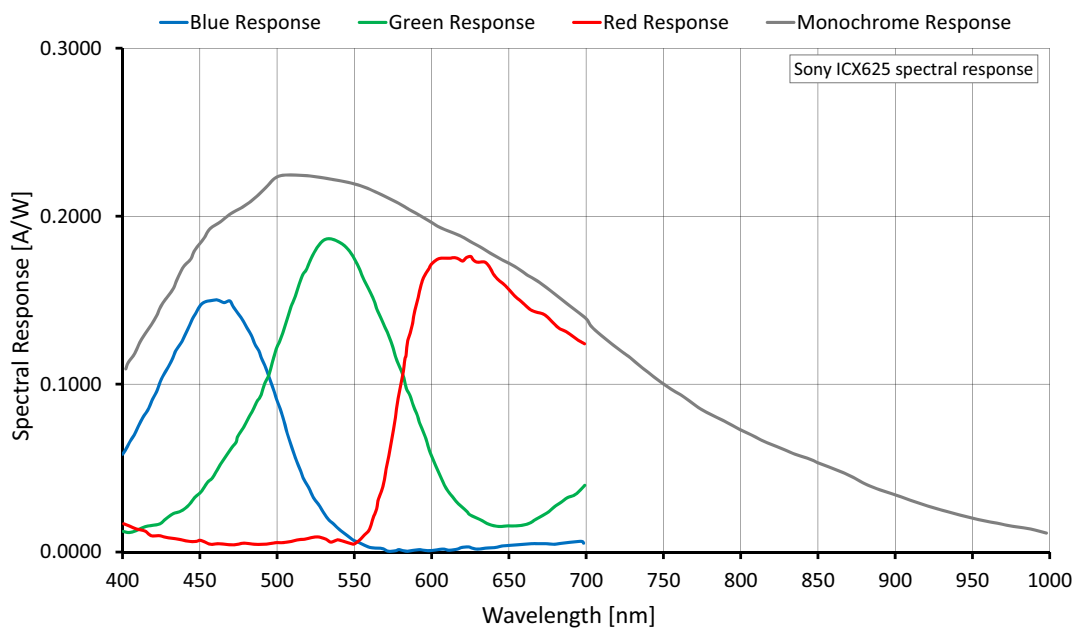


Figure 33: Prosilica GT2450 (Sony ICX625) spectral response



## ROI frame rates

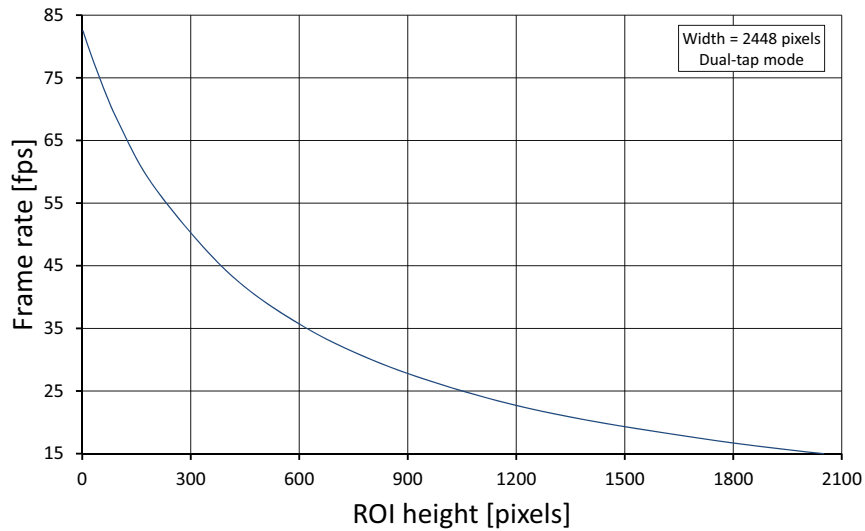


Figure 34: Prosilica GT2450 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
2050	15.0	1000	25.9	50	74.7
2000	15.3	800	30.0	20	79.4
1800	16.7	600	35.7	10	81.1
1600	18.4	400	44.1	2	82.5
1400	20.3	200	57.5		
1200	22.7	100	67.9		

Table 31: Frame rate as a function of ROI height (Width=2448 pixels)

The following table shows how binning affects ROI frame rates.

BinningVertical	Height	Frame rate	BinningVertical	Height	Frame rate
2	1025	25.4	9	227	54.8
3	683	33.1	10	205	56.6
4	512	38.9	11	186	58.2
5	410	43.4	12	170	59.6
6	341	47.1	13	157	60.8
7	292	50.2	14	146	61.8
8	256	52.7			

Table 32: Frame rate as a function of ROI height with vertical binning enabled (Width=2448 pixels)

## Prosilica GT2460 series

The following table provides model series specifications. The values are valid for Prosilica GT2460 and GT2460C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT2460	Prosilica GT2460C
Sensor model	Sony IMX264LLR	Sony IMX264LQR
Resolution	2464 (H) × 2056 (V); 5.1 MP	
Shutter type	Pregius® global shutter	
Sensor type	CMOS	
Sensor format	Type 2/3	
Sensor size	11.1 mm diagonal	
Pixel size	3.45 μm × 3.45 μm	
CRA <sup>1</sup>	0.0 degrees	
Housing	Standard format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	23.7 fps (28.7 fps burst mode)	
Maximum image bit depth	12-bit	
StreamHoldCapacity	Up to 26 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12, BayerRG12Packed
Exposure time control	<b>Pixel format</b>	<b>Value</b>
	Mono8, Mono12Packed, BayerRG8, BayerRG12Packed, YUV411Packed	30 μs to 85.9 s, 16.64 μs increments
	Mono12, BayerRG12, YUV422Packed	35 μs to 85.9 s, 22.16 μs increments
	RGB8Packed, BGR8Packed, YUV444Packed	47 μs to 85.9 s, 33.28 μs increments
Gain control	0.0 to 40.0 dB, 0.1 dB increments	

Table 33: Prosilica GT2460 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT2460	Prosilica GT2460C
Binning	Horizontal: 1 to 4 pixels Vertical: 1 to 4 rows	
Decimation X/Y	Horizontal and vertical: 1, 2, 4, 8 factor	
Power consumption	External power: 3.4 W at 12 VDC Power over Ethernet: 4.2 W	
Trigger latency	<b>Pixel format</b>	<b>Value</b>
	Mono8, Mono12Packed, BayerRG8, BayerRG12Packed, YUV411Packed	49.92 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	66.48 $\mu$ s
	RGB8Packed, BGR8Packed, YUV444Packed	99.84 $\mu$ s
Trigger jitter	<b>Pixel format</b>	<b>Value</b>
	Mono8, Mono12Packed, BayerRG8, BayerRG12Packed, YUV411Packed	$\pm$ 8.32 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	$\pm$ 11.08 $\mu$ s
	RGB8Packed, BGR8Packed, YUV444Packed	$\pm$ 16.64 $\mu$ s
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, Mono12Packed, BayerRG8, BayerRG12Packed, YUV411Packed	237 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	319 $\mu$ s
	RGB8Packed, BGR8Packed, YUV444Packed	486 $\mu$ s
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)	
Camera dimensions (L x W x H)	86 x 53.3 x 33 mm	
Mass (typical)	211 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm$ 1 °C	
<sup>1</sup> For more information on CRA, contact Allied Vision support.		

Table 33: Prosilica GT2460 model series specifications (sheet 2 of 2)

## Absolute QE

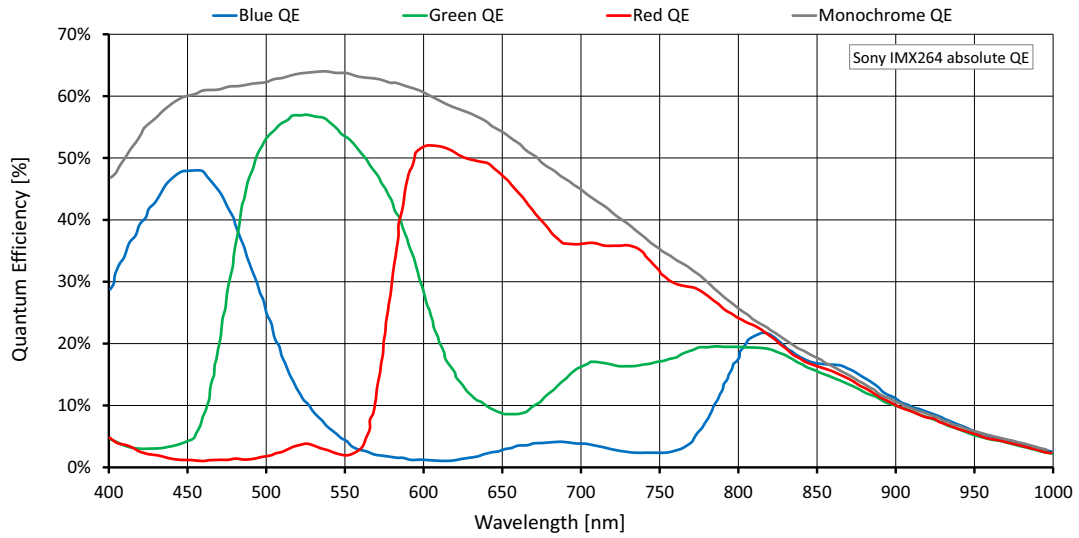


Figure 35: Prosilica GT2460 (Sony IMX264) absolute QE

## Spectral response

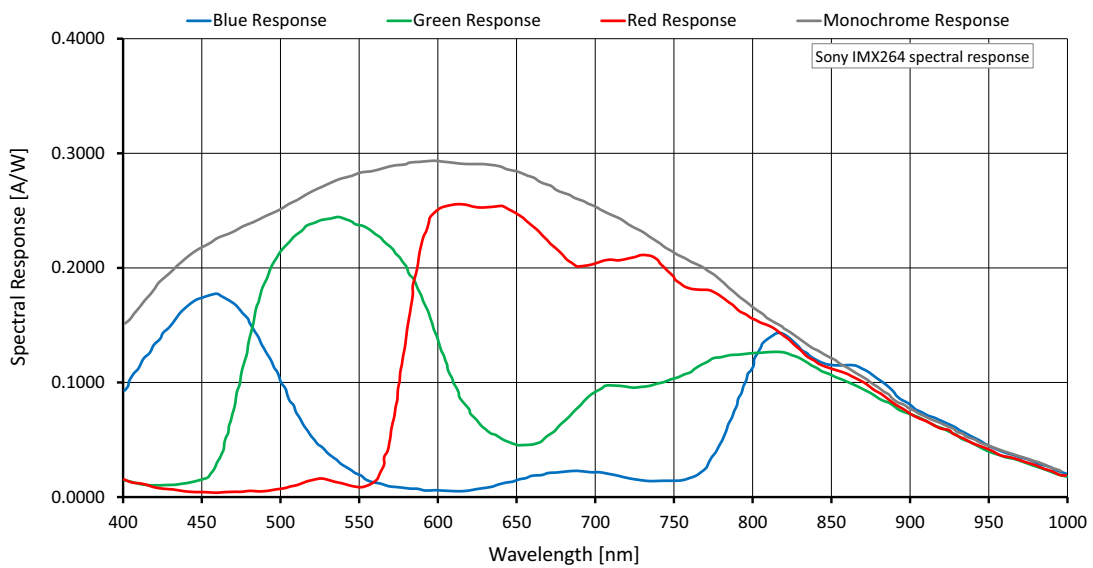


Figure 36: Prosilica GT2460 (Sony IMX264) spectral response

## ROI frame rates

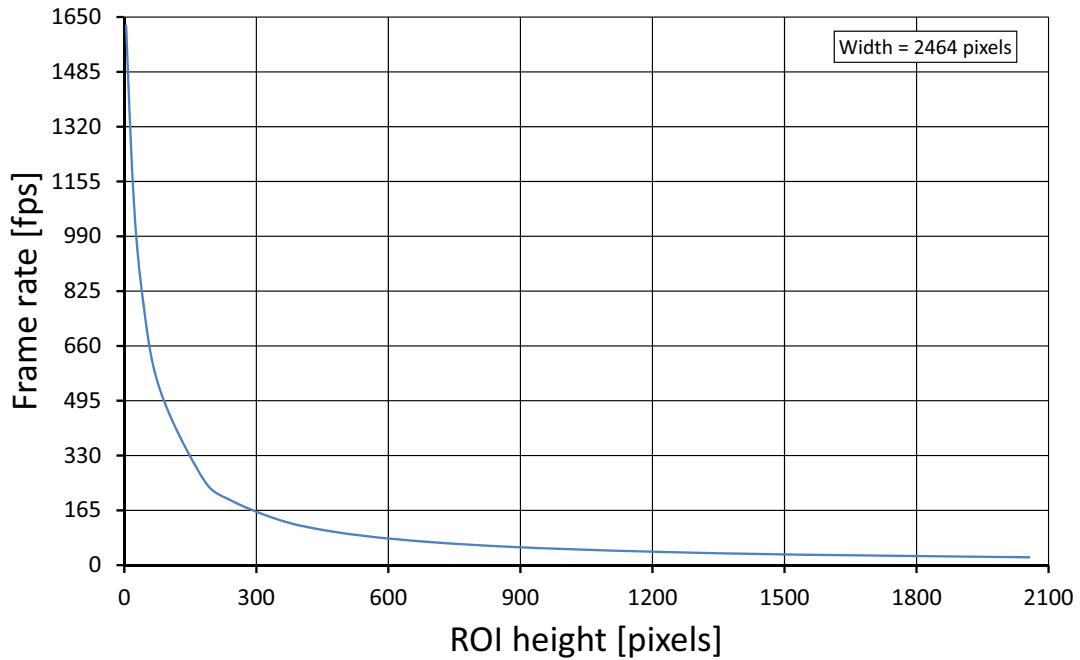


Figure 37: Prosilica GT2460 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
2056	23.7	768	63.0	80	531.8
1544	31.5	600	80.3	40	823.2
1324	36.7	480	99.8	20	1133.8
1280	37.9	360	132.9	4	1624.2
1024	47.3	240	196.4		
960	50.4	180	257.9		

Table 34: Frame rate as a function of ROI height (Width=2464 pixels)



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

## Prosilica GT2750 series

The following table provides model series specifications. The values are valid for Prosilica GT2750 and GT2750C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT2750	Prosilica GT2750C
Sensor model	Sony ICX694ALG	Sony ICX694AQG
Resolution	2750 (H) × 2200 (V); 6.1 MP	
Shutter type	Global shutter	
Sensor type	Interline CCD, Progressive Scan	
Sensor format	Type 1	
Sensor size	15.989 mm diagonal	
Pixel size	4.54 μm × 4.54 μm	
Housing	Extended format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	Quad-tap mode: 19.8 fps Single-tap mode: 5.7 fps	
Maximum image bit depth	12/14 bit	
StreamHoldCapacity	Up to 21 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed, Mono14	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW pixel formats	Not applicable	BayerGR8, BayerGR12, BayerRG12Packed
Exposure time control	10 μs to 26.8 s, 1 μs increments	
Gain control	0 to 33 dB; 1 dB increments	
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	
Power consumption	External power: 5.4 W at 12 VDC Power over Ethernet: 6.6 W	

Table 35: Prosilica GT2750 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT2750	Prosilica GT2750C
Trigger latency	2.2 $\mu$ s	
Trigger jitter	$\pm$ 20 ns	
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerGR8, Mono12Packed, BayerRG12Packed, YUV411Packed	55 $\mu$ s
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)	
Camera dimensions (L $\times$ W $\times$ H)	92 $\times$ 53.3 $\times$ 33 mm	
Mass (typical)	224 g	
Temperature monitoring	Available for main board and sensor board Resolution: 0.031; Accuracy: $\pm$ 1 °C	

Table 35: Prosilica GT2750 model series specifications (sheet 2 of 2)

## Absolute QE

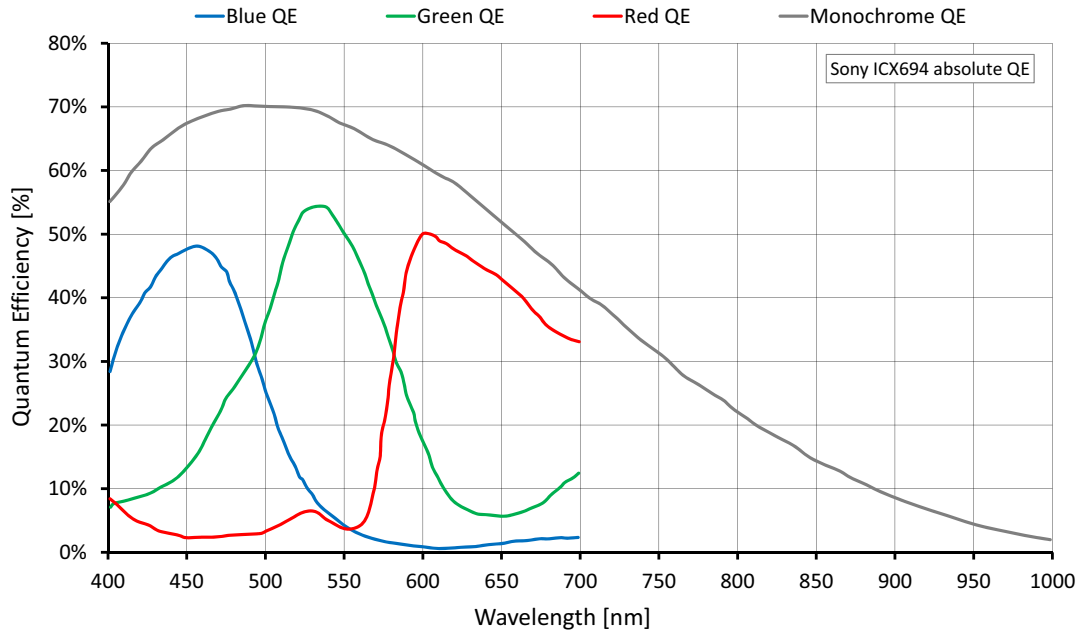


Figure 38: Prosilica GT2750 (Sony ICX694) absolute QE

## Spectral response

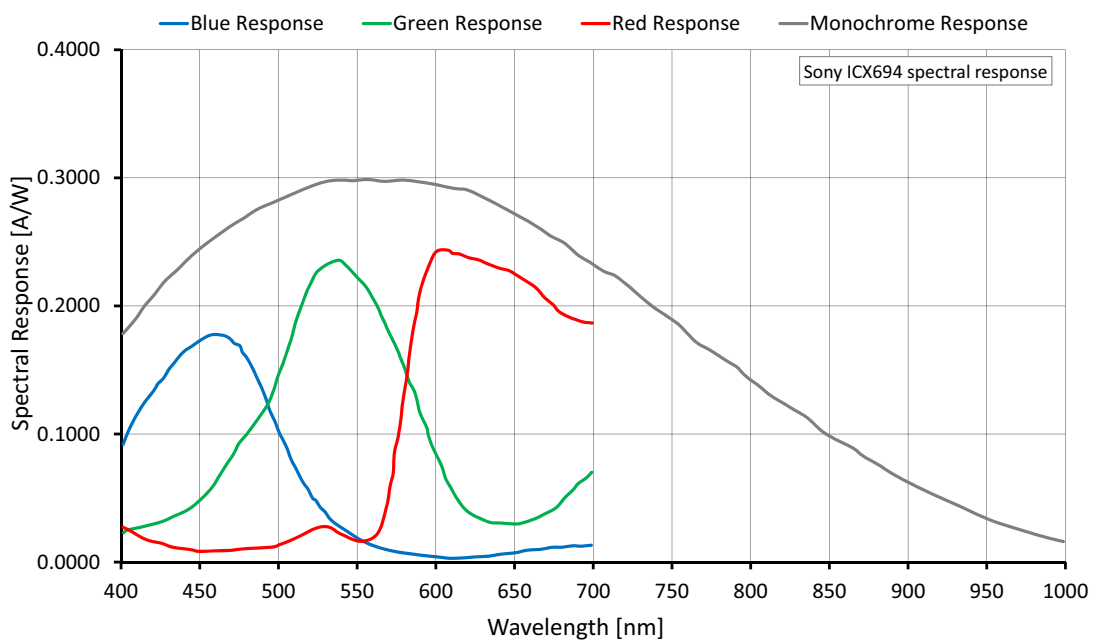


Figure 39: Prosilica GT2750 (Sony ICX694) spectral response



## ROI frame rates

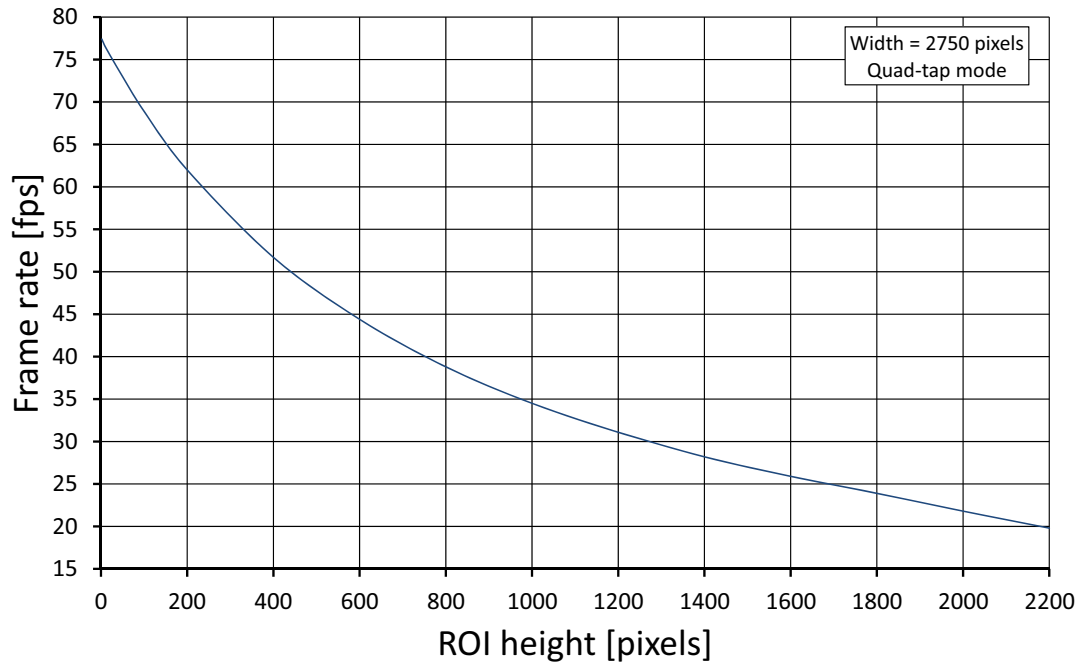


Figure 40: Prosilica GT2750 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
2200	19.8	1000	34.5	50	73.0
2000	21.8	800	38.8	20	75.6
1800	23.9	600	44.4	10	76.5
1600	25.9	400	51.7	2	77.4
1400	28.2	200	62.0		
1200	31.1	100	68.9		

Table 36: Frame rate as a function of ROI height (Width=2750 pixels)

The following table shows how binning affects ROI frame rates.

BinningVertical	Height	Frame rate	BinningVertical	Height	Frame rate
2	1100	37.0	6	366	77.4
3	732	50.2	7	314	83.8
4	550	60.9	8	274	88.9
5	440	70.0			

Table 37: Frame rate as a function of ROI height with vertical binning enabled (Width=2750 pixels)

## Prosilica GT3400 series

The following table provides model series specifications. The values are valid for Prosilica GT3400 and GT3400C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT3400	Prosilica GT3400C
Sensor model	Sony ICX814ALG	Sony ICX814AQG
Resolution	3384 (H) × 2704 (V); 9.2 MP	
Shutter type	Global shutter	
Sensor type	Interline CCD, Progressive Scan	
Sensor format	Type 1	
Sensor size	15.972 mm diagonal	
Pixel size	3.69 μm × 3.69 μm	
Housing	Extended format housing	
Default lens mount	C-Mount	
Maximum frame rate at full resolution	Quad-tap mode: 13.2 fps (14 fps burst mode) Single-tap mode: 3.8 fps	
Maximum image bit depth	12/14 bit	
StreamHoldCapacity	Up to 14 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed, Mono14	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12, BayerRG12Packed
Exposure time control	10 μs to 26.8 s, 1 μs increments	
Gain control	0 to 31 dB; 1 dB increments	
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	
Power consumption	External power: 5.4 W at 12 VDC Power over Ethernet: 6.6 W	
Trigger latency	2.5 μs	

Table 38: Prosilica GT3400 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT3400	Prosilica GT3400C
Trigger jitter	±20 ns	
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	54 μs
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)	
Camera dimensions (L × W × H)	92 × 53.3 × 33 mm	
Mass (typical)	224 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C	

Table 38: Prosilica GT3400 model series specifications (sheet 2 of 2)

## Absolute QE

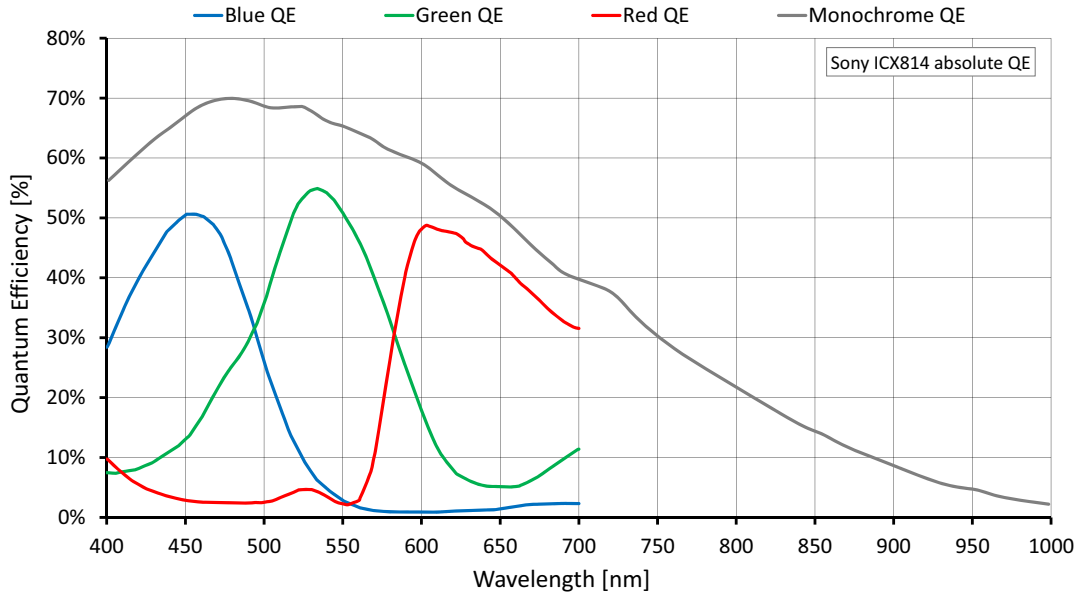


Figure 41: Prosilica GT3400 (Sony ICX814) absolute QE

## Spectral response

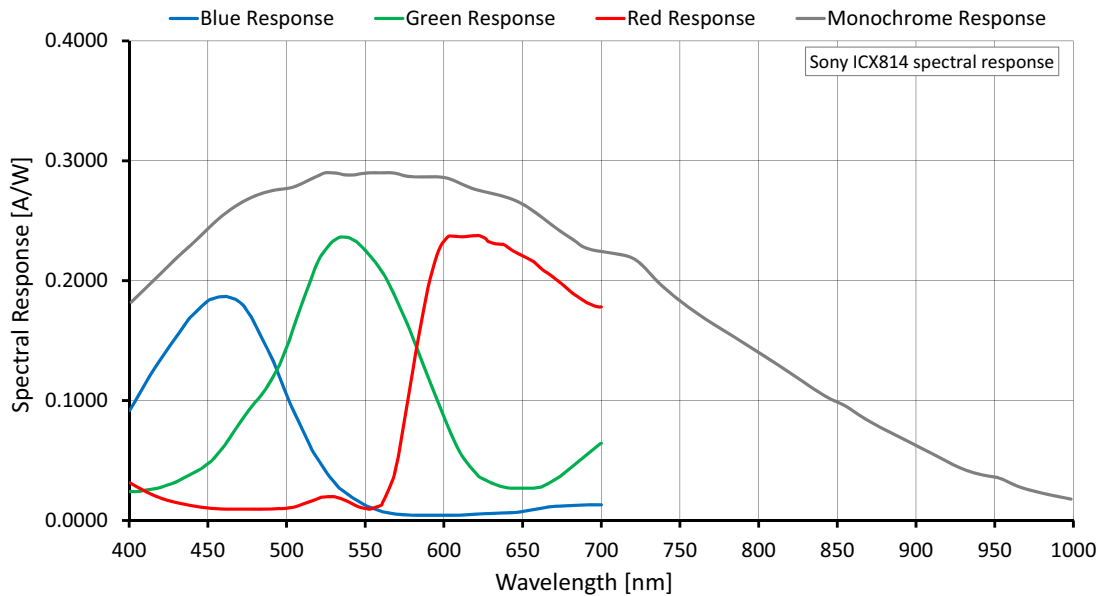


Figure 42: Prosilica GT3400 (Sony ICX814) spectral response

## ROI frame rates

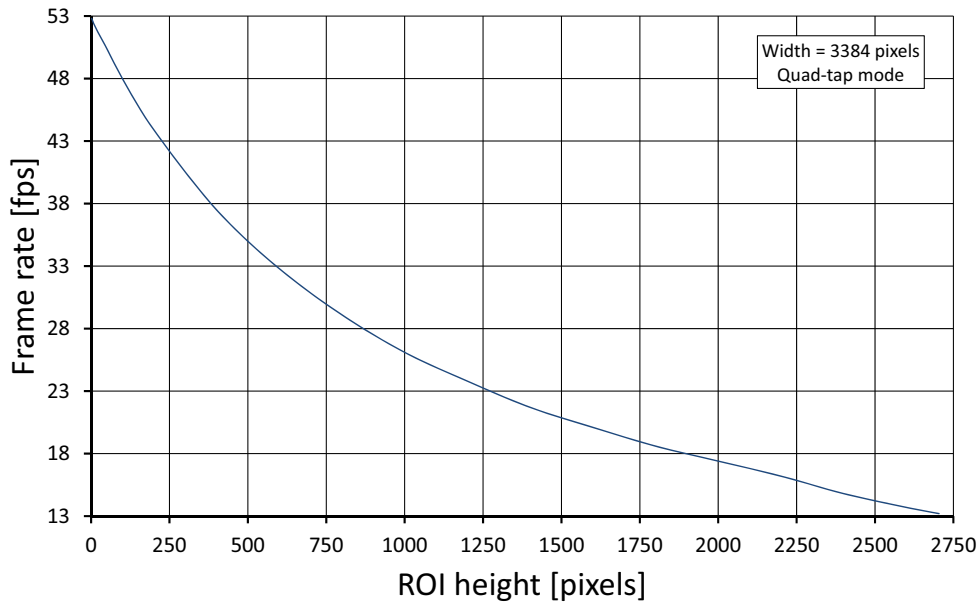


Figure 43: Prosilica GT3400 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
2704	13.2	1400	21.7	100	48.0
2600	13.7	1200	23.8	50	50.4
2400	14.8	1000	26.1	20	51.8
2200	16.2	800	29.1	10	52.3
2000	17.4	600	32.8	2	52.8
1800	18.6	400	37.5		
1600	20.1	200	43.9		

Table 39: Frame rate as a function of ROI height (Width=3384 pixels)

The following table shows how binning affects ROI frame rates.

BinningVertical	Height	Frame rate	BinningVertical	Height	Frame rate
2	1352	25.1	6	450	52.8
3	900	34.1	7	386	57.2
4	676	41.4	8	338	61.0
5	540	47.6			

Table 40: Frame rate as a function of ROI height with vertical binning enabled (Width=3384 pixels)

## Prosilica GT4090 series

The following table provides model series specifications. The values are valid for Prosilica GT4090 and GT4090NIR models. For specifications common to all models, see [Specifications common to all models](#).



### Discontinuation

Due to ON Semi's discontinuation of the PYTHON 12K sensor, the Prosilica GT4090 series has been discontinued with the last time buy period ending on October 31, 2020. For more information, see the Product change notice webpage at [www.alliedvision.com/en/support/product-change-notifications](http://www.alliedvision.com/en/support/product-change-notifications).

Feature	Specification	
	Prosilica GT4090	Prosilica GT4090NIR
Sensor model	ON Semi PYTHON 12K (NOIP1SN012KA)	ON Semi PYTHON 12K (NOIP1FN012KA)
Resolution	4096 (H) × 3072 (V); 12.5 MP	
Shutter type	Global shutter	
Sensor type	CMOS	
Sensor format	Type 4/3	
Sensor size	23.04 mm diagonal	
Pixel size	4.5 μm × 4.5 μm	
CRA <sup>1</sup>	10.6 degrees	
Housing	Large Format housing	
Default lens mount	F-Mount	
Maximum frame rate at full resolution	9.58 fps (Mono8) (10.15 fps burst mode) 4.79 fps (Mono10) (10.15 fps burst mode)	
Maximum image bit depth	10-bit	
StreamHoldCapacity	Up to 10 frames at full resolution	
Monochrome pixel formats	Mono8, Mono10	
Exposure control	1 μs to 1 s, 1 μs increments	
Gain control	0 to 22 dB	
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows	
Decimation X/Y	Horizontal and vertical: 1, 2, 4, 8 factor	
Power consumption	External power: 4.96 W at 12 VDC Power over Ethernet: 6.7 W	

Table 41: Prosilica GT4090 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT4090	Prosilica GT4090NIR
Trigger latency	25.8 $\mu$ s	
Trigger jitter	$\pm$ 100 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)	
Camera dimensions (L x W x H)	96 x 66 x 53.3 mm	
Mass	372 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm$ 1 °C	
<sup>1</sup> For more information on CRA, contact Allied Vision support.		

Table 41: Prosilica GT4090 model series specifications (sheet 2 of 2)

## Absolute QE

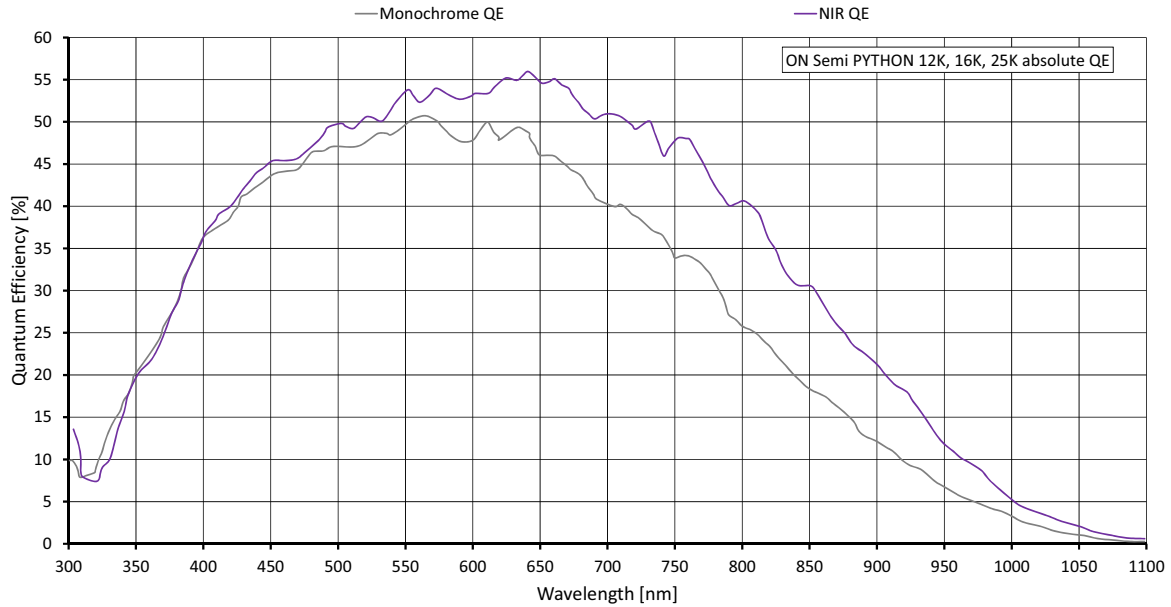


Figure 44: Prosilica GT4090 (ON Semi PYTHON 12K) absolute QE

## Spectral response

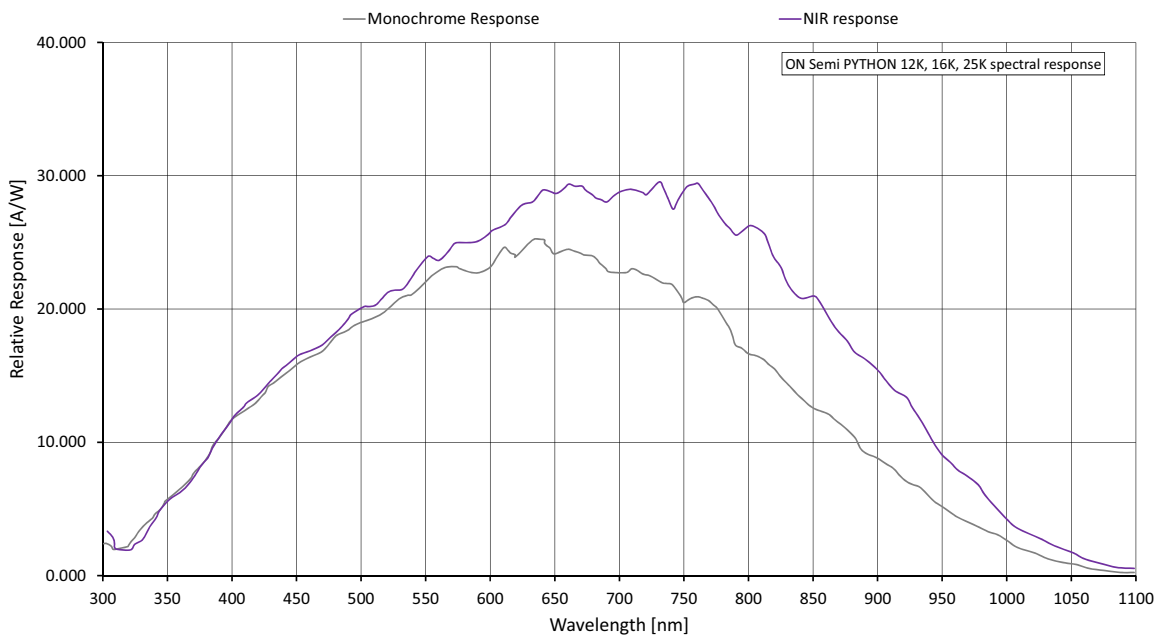


Figure 45: Prosilica GT4090 (ON Semi PYTHON 12K) spectral response



## ROI frame rates

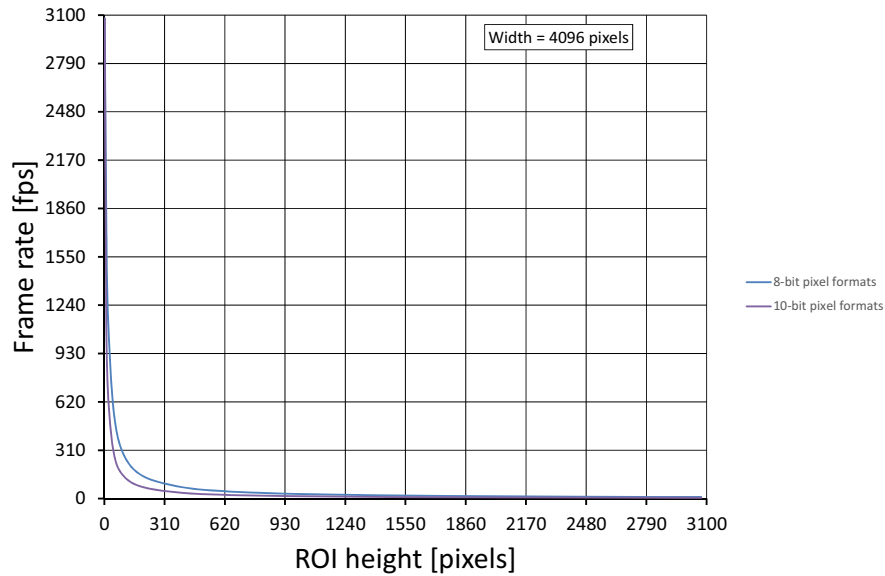


Figure 46: Prosilica GT4090 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
3072	9.6	1800	16.3	400	72.8
3000	9.8	1600	18.3	200	143.2
2800	10.5	1400	21.0	100	280.5
2600	11.3	1200	24.4	50	538.8
2400	12.3	1000	29.3	20	1122.5
2200	13.4	800	36.6	10	1759.0
2000	14.7	600	48.6	2	3078.8

Table 42: Frame rate as a function of ROI height (Mono8) (Width=4096 pixels)

Height	Frame rate	Height	Frame rate	Height	Frame rate
3072	4.8	1800	8.2	400	36.6
3000	4.9	1600	9.2	200	72.8
2800	5.3	1400	10.5	100	143.2
2600	5.7	1200	12.3	50	280.5
2400	6.1	1000	14.7	20	641.5
2200	6.7	800	18.3	10	1122.5
2000	7.4	600	24.4	2	3078.8

Table 43: Frame rate as a function of ROI height (Mono10) (Width=4096 pixels)

# Prosilica GT4096 series

The following table provides model series specifications. The values are valid for Prosilica GT4096 and GT4096NIR models. For specifications common to all models, see [Specifications common to all models](#).



## Discontinuation

Due to ON Semi's discontinuation of the PYTHON 16K sensor, the Prosilica GT4096 series has been discontinued with the last time buy period ending on October 31, 2020. For more information, see the Product change notice webpage at [www.alliedvision.com/en/support/product-change-notifications](http://www.alliedvision.com/en/support/product-change-notifications).

Feature	Specification	
	Prosilica GT4096	Prosilica GT4096NIR
Sensor model	ON Semi PYTHON 16K (NOIP1SN016KA)	ON Semi PYTHON 16K (NOIP1FN016KA)
Resolution	4096 (H) × 4096 (V); 16.7 MP	
Shutter type	Global shutter	
Sensor type	CMOS	
Sensor format and size	Type APS-H	
Sensor size	26.067 mm diagonal	
Pixel size	4.5 μm × 4.5 μm	
CRA <sup>1</sup>	10.6 degrees	
Housing	Large Format housing	
Default lens mount	F-Mount	
Maximum frame rate at full resolution	7.18 fps (Mono8) (7.61 fps burst mode) 3.59 (Mono10) (7.61 fps burst mode)	
Maximum image bit depth	10-bit	
StreamHoldCapacity	Up to 7 frames at full resolution	
Monochrome pixel formats	Mono8, Mono10	
Exposure control	1 μs to 1 s, 1 μs increments	
Gain control	0 to 22 dB	
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows	
Decimation X/Y	Horizontal and vertical: 1, 2, 4, 8 factor	
Power consumption	External power: 5.0 W at 12 VDC Power over Ethernet: 6.4 W	

Table 44: Prosilica GT4096 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT4096	Prosilica GT4096NIR
Trigger latency	25.8 $\mu$ s	
Trigger jitter	$\pm$ 100 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)	
Camera dimensions (L x W x H)	96 x 66 x 53.3 mm	
Mass	372 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm$ 1 °C	
<sup>1</sup> For more information on CRA, contact the sensor manufacturer.		

Table 44: Prosilica GT4096 model series specifications (sheet 2 of 2)

## Absolute QE

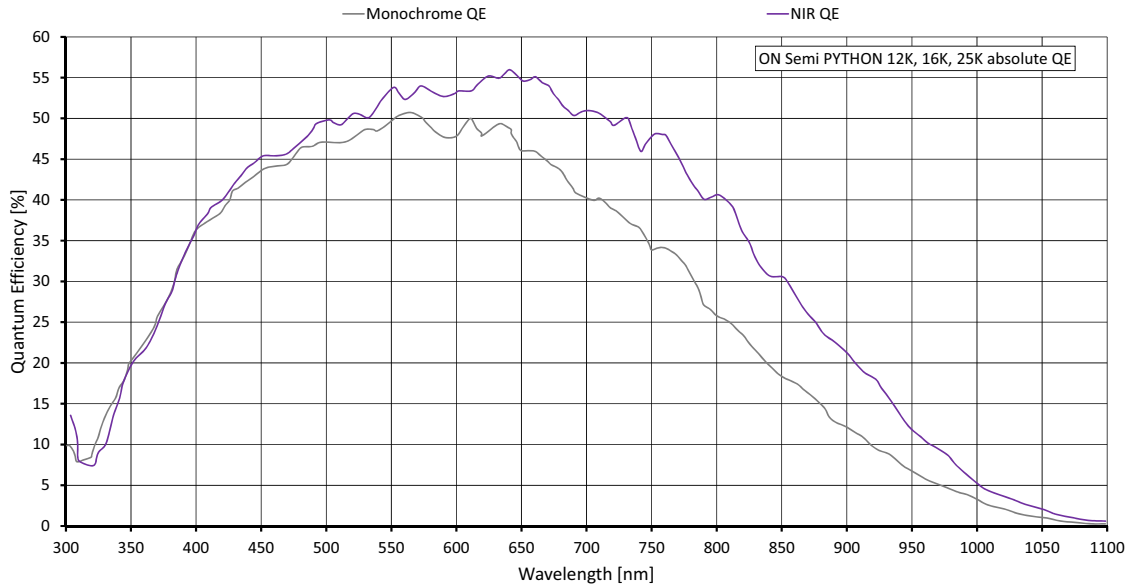


Figure 47: Prosilica GT4096 (ON Semi PYTHON 16K) absolute QE

## Spectral response

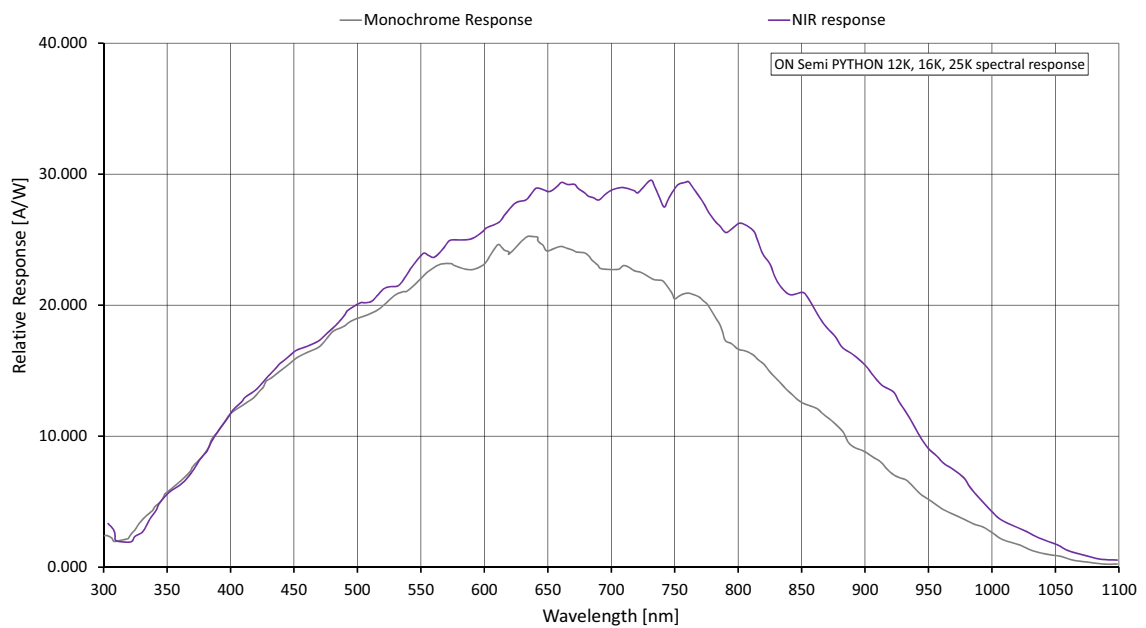


Figure 48: Prosilica GT4096 (ON Semi PYTHON 16K) spectral response

## ROI frame rates

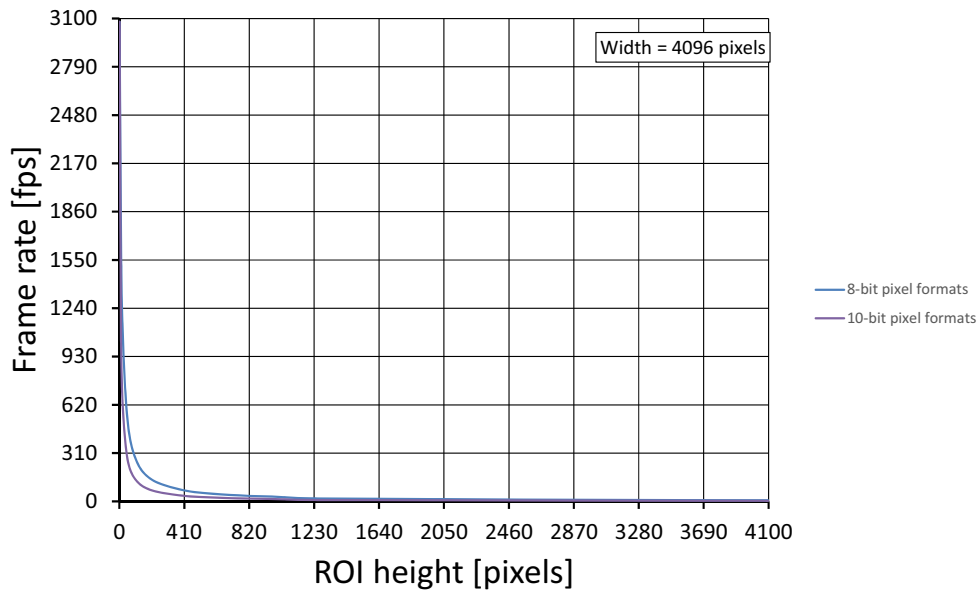


Figure 49: Prosilica GT4096 frame rate as a function of ROI height

Height	Frame rate
4096	7.2
4000	7.4
3500	8.4
3000	9.8
2500	11.8
2000	14.7

Height	Frame rate
1200	19.6
1000	29.3
800	36.6
600	48.6
400	72.8
200	143.2

Height	Frame rate
100	280.5
50	538.8
20	1122.5
10	1759.0
2	3078.8

Table 45: Frame rate as a function of ROI height (Mono8) (Width=4096 pixels)

Height	Frame rate
4096	3.6
4000	3.7
3500	4.2
3000	4.9
2500	5.9
2000	7.4

Height	Frame rate
1200	9.8
1000	14.7
800	18.3
600	24.4
400	36.6
200	72.8

Height	Frame rate
100	143.2
50	280.5
20	641.5
10	1122.5
2	3078.8

Table 46: Frame rate as a function of ROI height (Mono10) (Width=4096 pixels)

## Prosilica GT4400 series

The following table provides model series specifications. The values are valid for Prosilica GT4400 and GT4400C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT4400	Prosilica GT4400C
Sensor model	Sony IMX367LLA	Sony IMX367LQA
Resolution	4432 (H) × 4436 (V); 19.6 MP	
Shutter type	Pregius® global shutter	
Sensor type	CMOS	
Sensor format	Type 4/3	
Aspect ratio	1:1	
Sensor size	21.6 mm diagonal	
Pixel size	3.45 μm × 3.45 μm	
CRA <sup>1</sup>	0.0 degrees	
Housing	Large Format housing	
Default lens mount	F-Mount	
Maximum frame rate at full resolution	6.12 fps (7.05 fps burst mode)	
Maximum image bit depth	12-bit	
StreamHoldCapacity	Up to 6 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12, BayerRG12Packed
Exposure time control	31 μs to 171.8 s; 1 μs increments	
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	
Power consumption	External power: 5.0 W at 12 VDC Power over Ethernet: 6.2 W	

Table 47: Prosilica GT4400 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT4400	Prosilica GT4400C
Trigger latency	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	95.04 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	126.72 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	190.08 $\mu$ s
Trigger jitter	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	$\pm$ 15.84 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	$\pm$ 21.12 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	$\pm$ 31.68 $\mu$ s
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	604 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	815 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	1238 $\mu$ s
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)	
Camera dimensions (L x W x H)	67.1 x 66 x 53.3 mm	
Mass (typical)	372 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm$ 1 °C	
<sup>1</sup> For more information on CRA, contact Allied Vision support.		

Table 47: Prosilica GT4400 model series specifications (sheet 2 of 2)

## Absolute QE

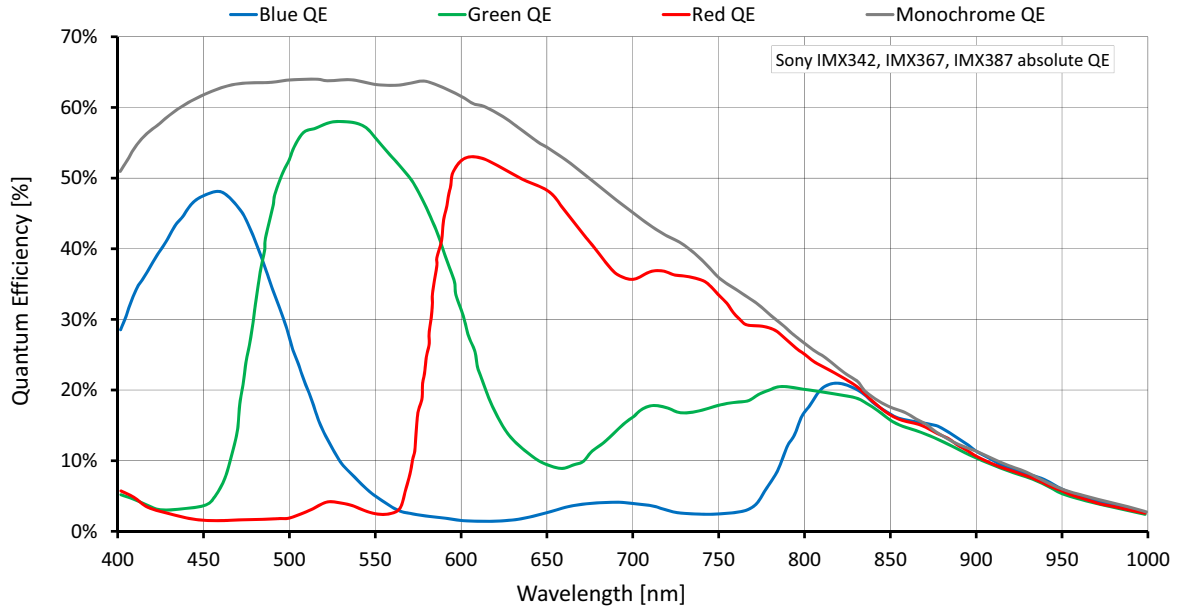


Figure 50: Prosilica GT4400 (Sony IMX367) absolute QE

## Spectral response

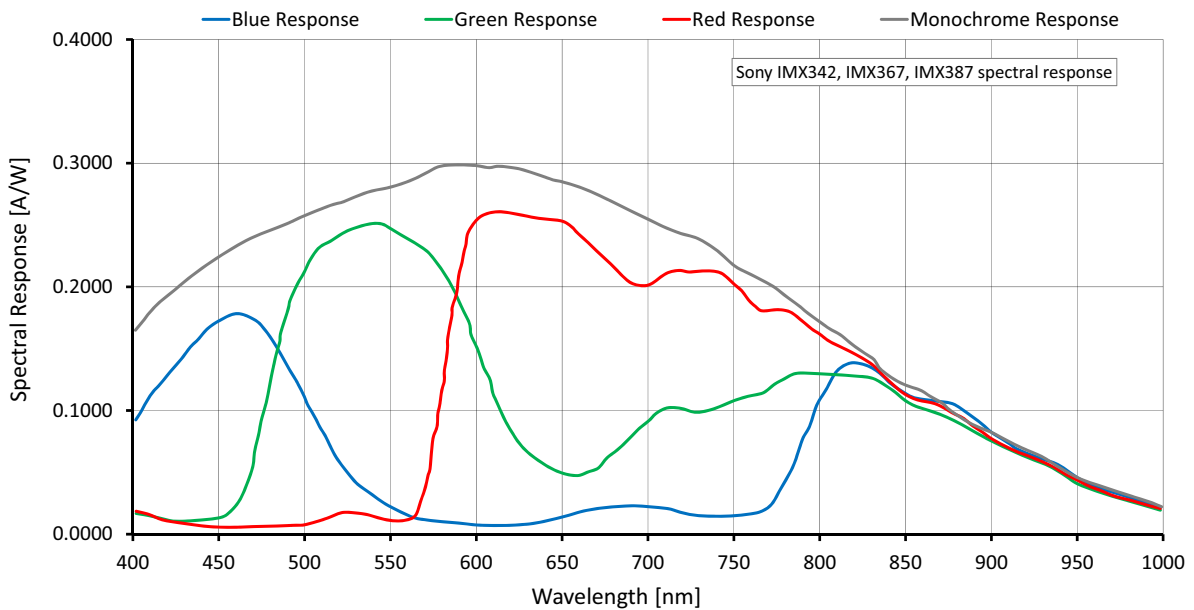


Figure 51: Prosilica GT4400 (Sony IMX367) spectral response



## ROI frame rates

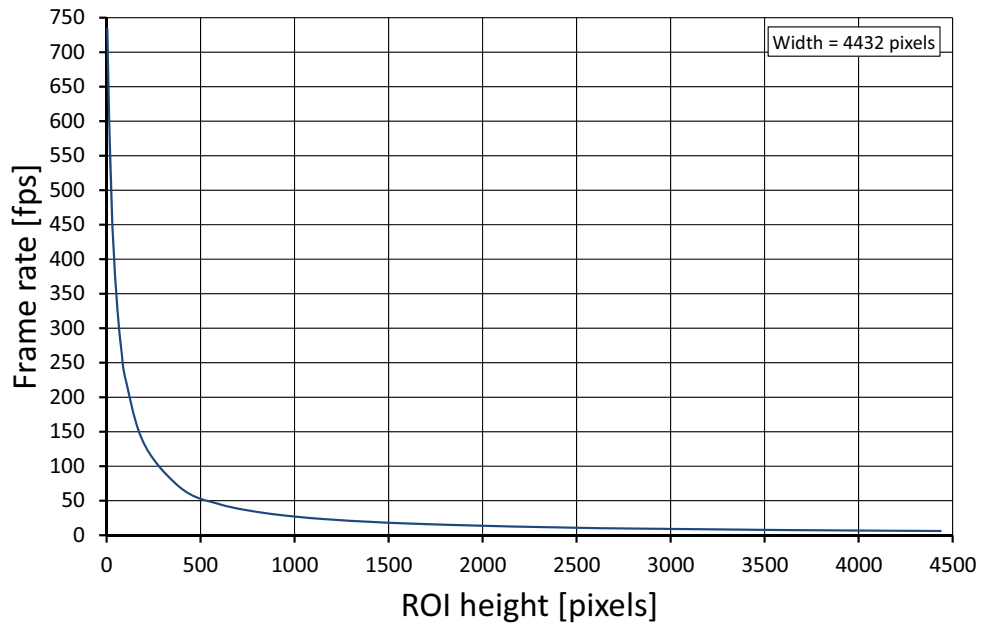


Figure 52: Prosilica GT4400 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
4436	6.12	1200	22.58	80	265.26
4000	6.79	1000	27.07	64	306.46
3500	7.77	800	33.83	48	362.82
3000	9.05	600	45.03	32	444.58
2500	10.87	400	67.3	16	573.92
2000	13.58	200	132.07	4	734.05
1500	18.09	100	227.09		

Table 48: Frame rate as a function of ROI height (Width=4432 pixels)



**2K video frame rate = 25.09** frames per second

Height = 1080 pixels, Width = Maximum

**4K video frame rate = 12.58** frames per second

Height = 2160 pixels, Width = Maximum

## Prosilica GT5120 series

The following table provides model series specifications. The values are valid for Prosilica GT5120 and GT5120NIR models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT5120	Prosilica GT5120NIR
Sensor model	ON Semi PYTHON 25K (NOIP1SN025KA)	ON Semi PYTHON 25K (NOIP1FN025KA)
Resolution	5120 (H) × 5120 (V); 26.2 MP	
Shutter type	Global shutter	
Sensor type	CMOS	
Sensor format	Type APS-H	
Sensor size	32.6 mm diagonal	
Pixel size	4.5 μm × 4.5 μm	
CRA <sup>1</sup>	10.6 degrees	
Housing	Large Format housing	
Default lens mount	F-Mount	
Maximum frame rate at full resolution	4.59 fps (Mono8) (4.91 fps burst mode) 2.30 fps (Mono10) (4.91 fps burst mode)	
Maximum image bit depth	10-bit	
StreamHoldCapacity	Up to 4 frames at full resolution	
Monochrome pixel formats	Mono8, Mono10	
Exposure time control	1 μs to 1 s, 1 μs increments	
Gain control	0 to 22 dB	
Binning	Horizontal: 1 to 8 columns Vertical: 1 to 8 rows	
Decimation X/Y	Horizontal and vertical: 1, 2, 4, 8 factor	
Power consumption	External power: 5.02 W at 12 VDC Power over Ethernet: 6.3 W	
Trigger latency	25.8 μs	
Trigger jitter	±100 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 49: Prosilica GT5120 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT5120	Prosilica GT5120NIR
Camera dimensions (L × W × H)	96 × 66 × 53.3 mm	
Mass (typical)	372 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: ±1 °C	
<sup>1</sup> For more information on CRA, contact Allied Vision support.		

*Table 49: Prosilica GT5120 model series specifications (sheet 2 of 2)*

## Absolute QE

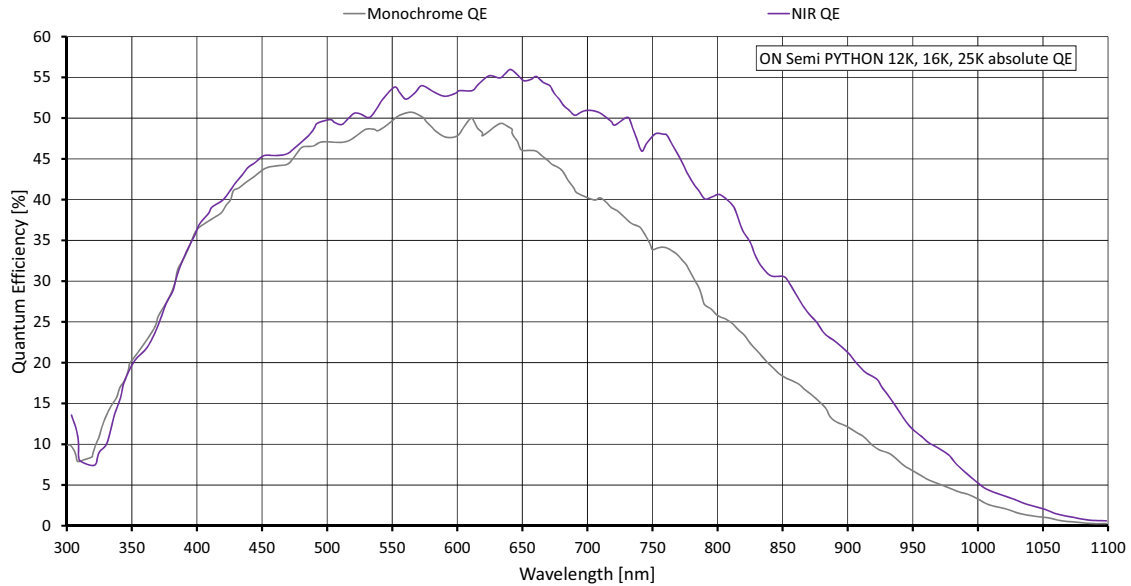


Figure 53: Prosilica GT5120 (ON Semi PYTHON 25K) absolute QE

## Spectral response

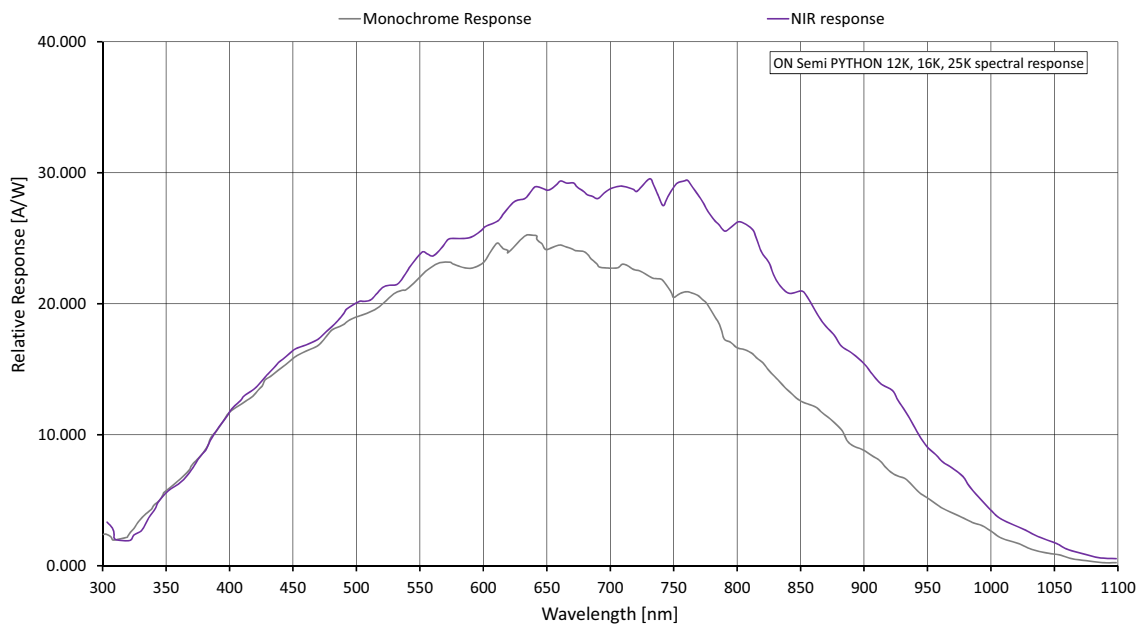


Figure 54: Prosilica GT5120 (ON Semi PYTHON 25K) spectral response

## ROI frame rates

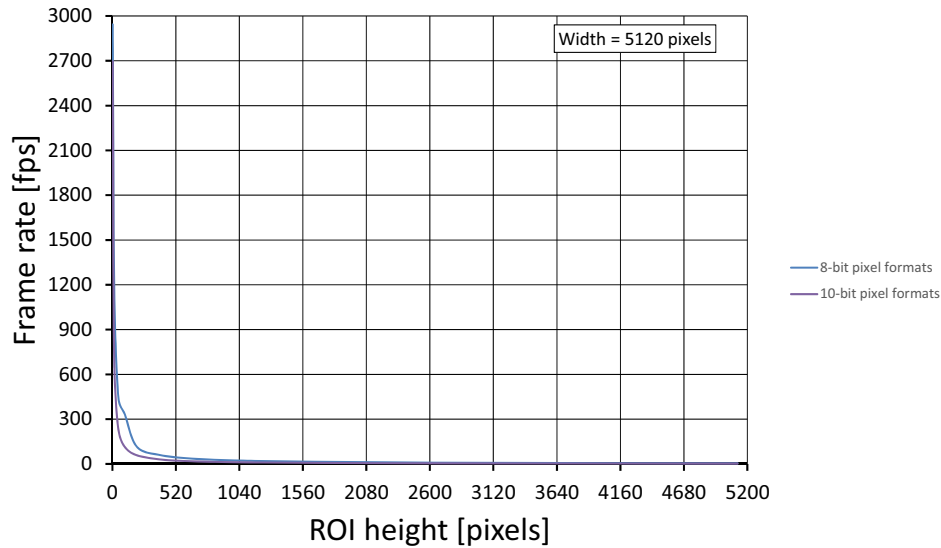


Figure 55: Prosilica GT5120 frame rate as a function of ROI height

Height	Frame rate
5120	4.6
5000	4.7
4500	5.2
4000	5.9
3500	6.7
3000	7.9
2500	9.4

Height	Frame rate
2000	11.8
1500	15.7
1000	23.5
800	29.3
600	39.0
400	58.3
200	115.1

Height	Frame rate
100	224.4
50	434.4
20	948.4
10	1521.4
2	2943.8

Table 50: Frame rate as a function of ROI height (Mono8) (Width=5120 pixels)

Height	Frame rate
5120	2.3
5000	2.4
4500	2.6
4000	2.9
3500	3.4
3000	3.9
2500	4.7

Height	Frame rate
2000	5.9
1500	7.9
1000	11.8
800	14.7
600	19.6
400	29.3
200	58.3

Height	Frame rate
100	115.1
50	224.4
20	538.8
10	962.6
2	2696.1

Table 51: Frame rate as a function of ROI height (Mono10) (Width=5120 pixels)

## Prosilica GT5400 series

The following table provides model series specifications. The values are valid for Prosilica GT5400 and GT5400C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT5400	Prosilica GT5400C
Sensor model	Sony IMX387LLA	Sony IMX387LQA
Resolution	5472 (H) × 3084 (V); 16.8 MP	
Shutter type	Pregius® global shutter	
Sensor type	CMOS	
Sensor format	Type 4/3	
Aspect ratio	16:9	
Sensor size	21.7 mm diagonal	
Pixel size	3.45 μm × 3.45 μm	
CRA <sup>1</sup>	0.0 degrees	
Housing	Large Format housing	
Default lens mount	F-Mount	
Maximum frame rate at full resolution	7.14 fps (8.27 fps burst mode)	
Maximum image bit depth	12-bit	
StreamHoldCapacity	Up to 7 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12, BayerRG12Packed
Exposure time control	31 μs to 171.8 s; 1 μs increments	
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	
Power consumption	External power: 5.2 W at 12 VDC Power over Ethernet: 6.4 W	

Table 52: Prosilica GT5400 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT5400	Prosilica GT5400C
Trigger latency	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	116.16 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	154.56 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	232.32 $\mu$ s
Trigger jitter	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	$\pm$ 19.36 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	$\pm$ 25.76 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	$\pm$ 38.72 $\mu$ s
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	745 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	1001 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	1520 $\mu$ s
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)	
Camera dimensions (L x W x H)	67.1 x 66 x 53.3 mm	
Mass (typical)	372 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm$ 1 °C	
<sup>1</sup> For more information on CRA, contact Allied Vision support.		

Table 52: Prosilica GT5400 model series specifications (sheet 2 of 2)

## Absolute QE

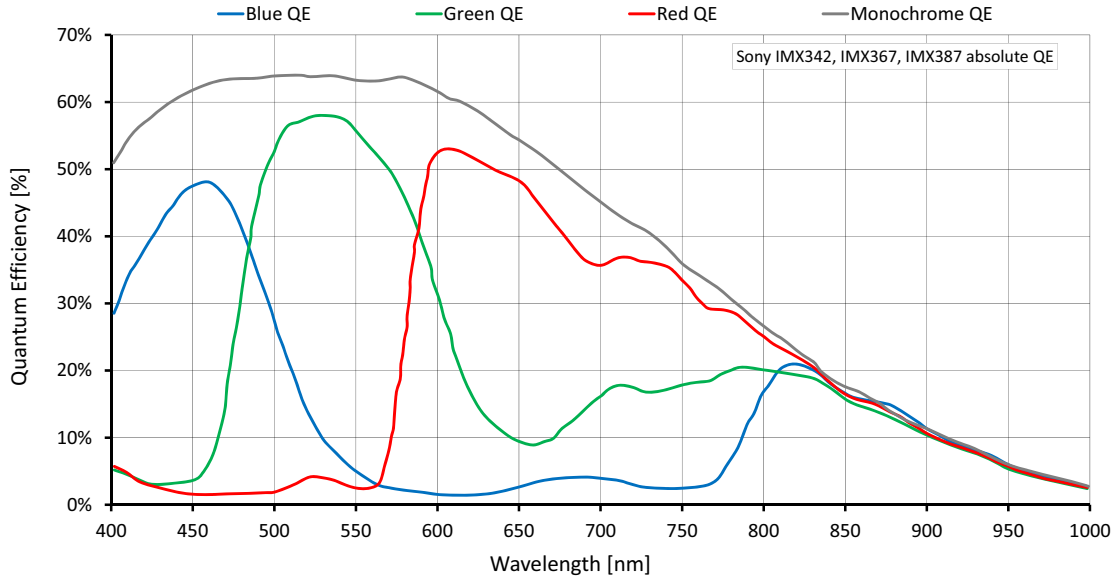


Figure 56: Prosilica GT5400 (Sony IMX387) absolute QE

## Spectral response

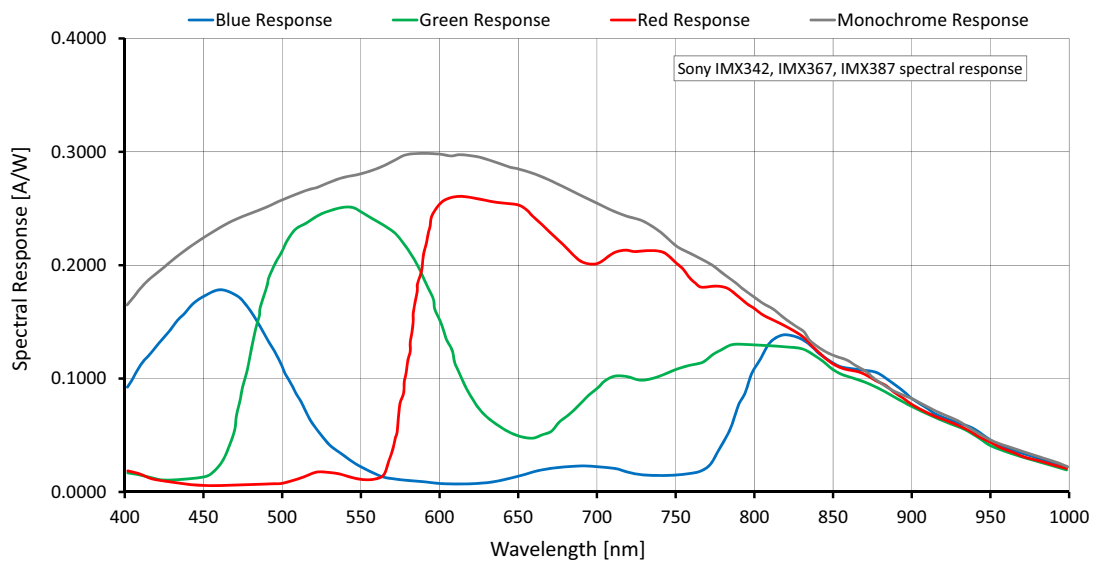


Figure 57: Prosilica GT5400 (Sony IMX387) spectral response



## ROI frame rates

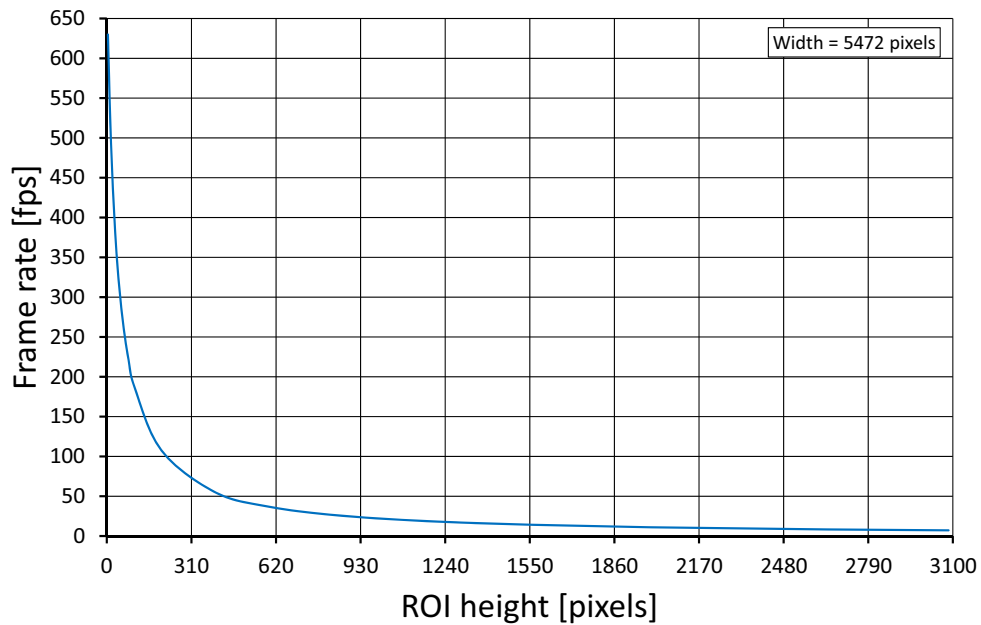


Figure 58: Prosilica GT5400 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
3048	7.14	1000	21.96	80	220.74
3000	7.33	800	27.42	64	255.7
2500	8.8	600	36.48	48	303.84
2000	10.99	400	54.49	32	374.29
1500	14.67	200	107.61	16	487.28
1200	18.32	100	188.51	4	629.88

Table 53: Frame rate as a function of ROI height (Width=5472 pixels)



**2K video frame rate = 20.32** frames per second

Height = 1080 pixels, Width = Maximum

**4K video frame rate = 10.18** frames per second

Height = 2160 pixels, Width = Maximum

## Prosilica GT6400 series

The following table provides model series specifications. The values are valid for Prosilica GT6400 and GT6400C models. For specifications common to all models, see [Specifications common to all models](#).

Feature	Specification	
	Prosilica GT6400	Prosilica GT6400C
Sensor model	Sony IMX342LLA	Sony IMX342LQA
Resolution	6480 (H) × 4860 (V); 31.4 MP	
Shutter type	Pregius® global shutter	
Sensor type	CMOS	
Sensor format	Type APS-C	
Aspect ratio	4:3	
Sensor size	27.9 mm diagonal	
Pixel size	3.45 μm × 3.45 μm	
CRA <sup>1</sup>	0.0 degrees	
Housing	Large Format housing	
Default lens mount	F-Mount	
Maximum frame rate at full resolution	3.82 fps (4.49 fps burst mode)	
Maximum image bit depth	12-bit	
StreamHoldCapacity	Up to 4 frames at full resolution	
Monochrome pixel formats	Mono8, Mono12, Mono12Packed	Mono8
YUV color pixel formats	Not applicable	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	Not applicable	RGB8Packed, BGR8Packed
RAW pixel formats	Not applicable	BayerRG8, BayerRG12, BayerRG12Packed
Exposure time control	31 μs to 171.8 s; 1 μs increments	
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	
Power consumption	External power: 5.4 W at 12 VDC Power over Ethernet: 6.7 W	

Table 54: Prosilica GT6400 model series specifications (sheet 1 of 2)

Feature	Specification	
	Prosilica GT6400	Prosilica GT6400C
Trigger latency	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	136.32 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	181.44 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	272.64 $\mu$ s
Trigger jitter	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	$\pm$ 22.72 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	$\pm$ 30.24 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	$\pm$ 45.44 $\mu$ s
Time between exposures	<b>Pixel format</b>	<b>Value</b>
	Mono8, BayerRG8, Mono12Packed, BayerRG12Packed, YUV411Packed	880 $\mu$ s
	Mono12, BayerRG12, YUV422Packed	1180 $\mu$ s
	YUV444Packed, RGB8Packed, BGR8Packed	1788 $\mu$ s
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)	
Camera dimensions (L x W x H)	96 x 66 x 53.3 mm	
Mass (typical)	372 g	
Temperature monitoring	Available for main board and sensor board. Resolution: 0.031; Accuracy: $\pm$ 1 °C	
<sup>1</sup> For more information on CRA, contact Allied Vision support.		

Table 54: Prosilica GT6400 model series specifications (sheet 2 of 2)

## Absolute QE

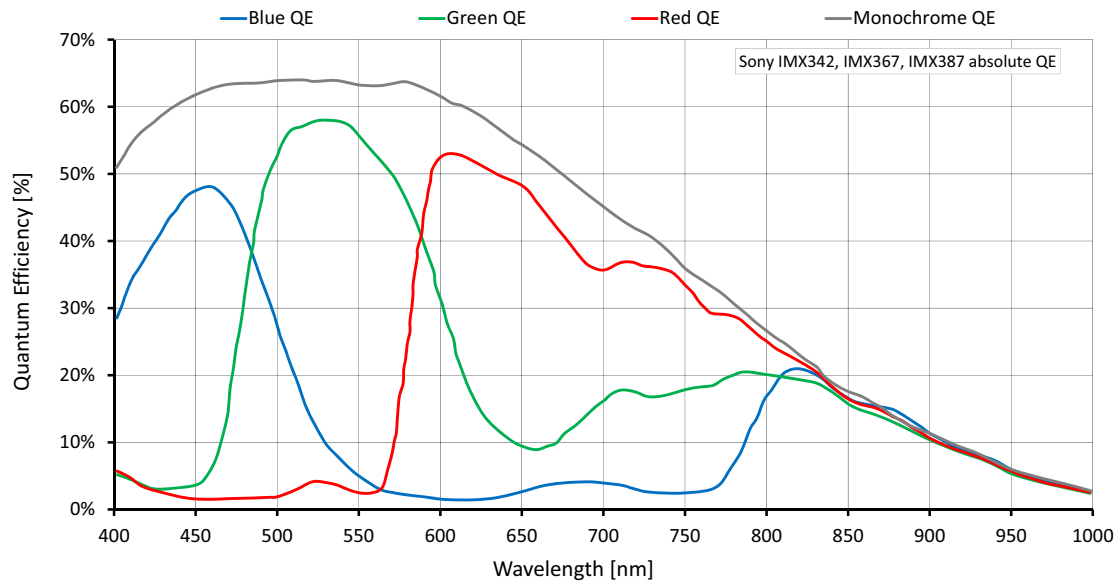


Figure 59: Prosilica GT6400 (Sony IMX342) absolute QE

## Spectral response

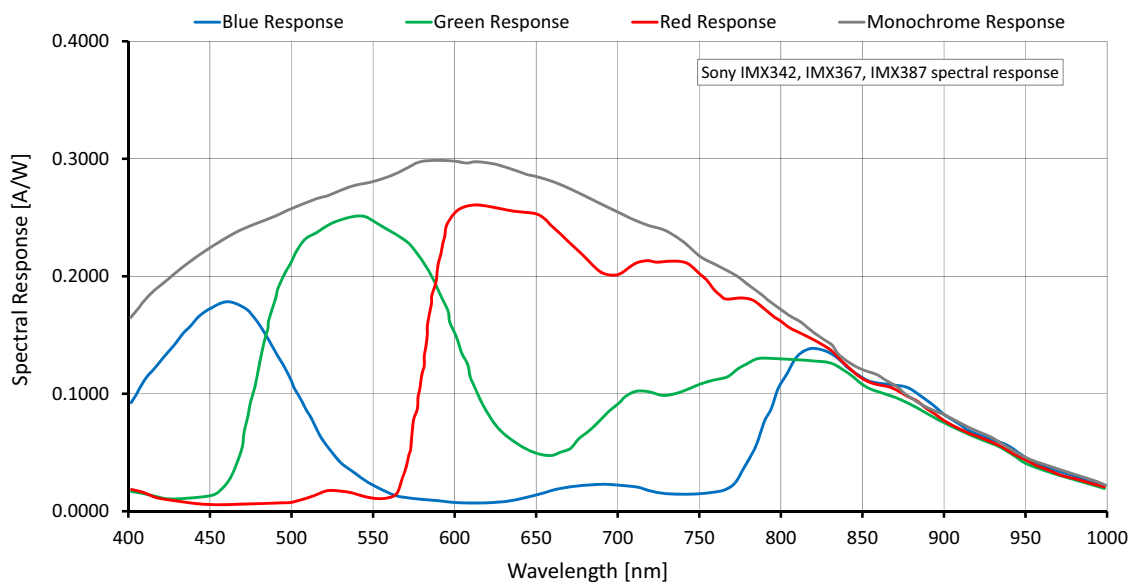


Figure 60: Prosilica GT6400 (Sony IMX342) spectral response

## ROI frame rates

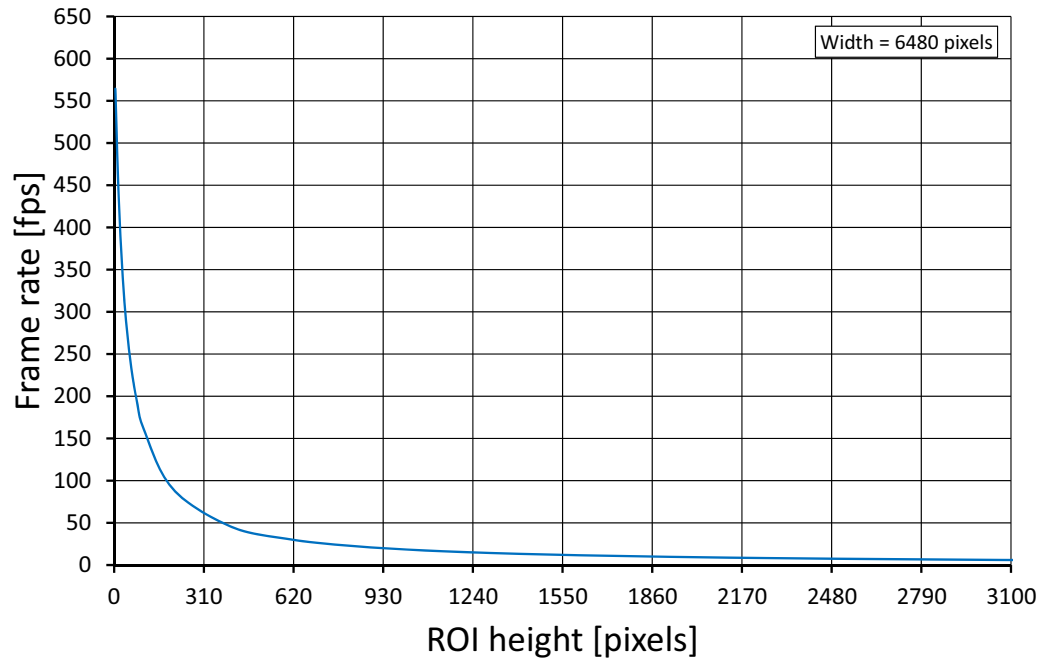


Figure 61: Prosilica GT6400 frame rate as a function of ROI height

Height	Frame rate	Height	Frame rate	Height	Frame rate
4860	3.82	1500	12.38	100	163.01
4500	4.13	1200	15.46	80	191.36
4000	4.65	1000	18.57	64	222.29
3500	5.31	800	23.16	48	265.14
3000	6.2	600	30.86	32	328.46
2500	7.43	400	46.03	16	431.51
2000	9.29	200	91.31	4	564.27

Table 55: Frame rate as a function of ROI height (Width=6480 pixels)



**2K video frame rate = 17.2** frames per second

Height = 1080 pixels, Width = Maximum

**4K video frame rate = 8.61** frames per second

Height = 2160 pixels, Width = Maximum

## Prosilica GT model series comparison

Model series	Sensor model	Sensor type	Sensor format	Resolution	Frame rate
GT1290	Sony ICX445	CCD	Type 1/3	1280 × 960	33.3 fps
GT1380	Sony ICX285	CCD	Type 2/3	1360 × 1024	30.5 fps
GT1600	Sony ICX274	CCD	Type 1/1.8	1620 × 1220	25.8 fps
GT1920	Sony ICX674	CCD	Type 2/3	1936 × 1456	40.7 fps <sup>1</sup>
GT1930	Sony IMX174	CMOS	Type 1/1.2	1936 × 1216	50.8 fps
GT1930L	Sony IMX174	CMOS	Type 1/1.2	1936 × 1216	50.8 fps
GT2000	CMOSIS/ams CMV2000	CMOS	Type 2/3	2048 × 1088	53.7 fps
GT2050	CMOSIS/ams CMV4000	CMOS	Type 1	2048 × 2048	28.6 fps
GT2450	Sony ICX625	CCD	Type 2/3	2448 × 2050	15 fps
GT2460	Sony IMX264	CMOS	Type 2/3	2464 × 2056	23.7 fps
GT2750	Sony ICX694	CCD	Type 1	2750 × 2200	19.8 fps <sup>1</sup>
GT3400	Sony ICX814	CCD	Type 1	3384 × 2704	13.2 fps <sup>1</sup>
GT4090	ON Semi PYTHON 12K	CMOS	Type 4/3	4096 × 3072	9.58 fps
GT4096	ON Semi PYTHON 16K	CMOS	Type APS-H	4096 × 4096	7.18 fps
GT4400	Sony IMX367	CMOS	Type 4/3	4432 × 4436	6.12 fps
GT5120	ON Semi PYTHON 25K	CMOS	Type APS-H	5120 × 5120	4.60 fps
GT5400	Sony IMX387	CMOS	Type 4/3	5472 × 3084	7.14 fps
GT6400	Sony IMX342	CMOS	Type APS-C	6480 × 4860	3.82 fps

<sup>1</sup> Frame rate reflects quad-tap mode. See the specification tables for the frame rate for single-tap mode.

*Table 56: Prosilica GT model series overview*

## Frame rate comparison

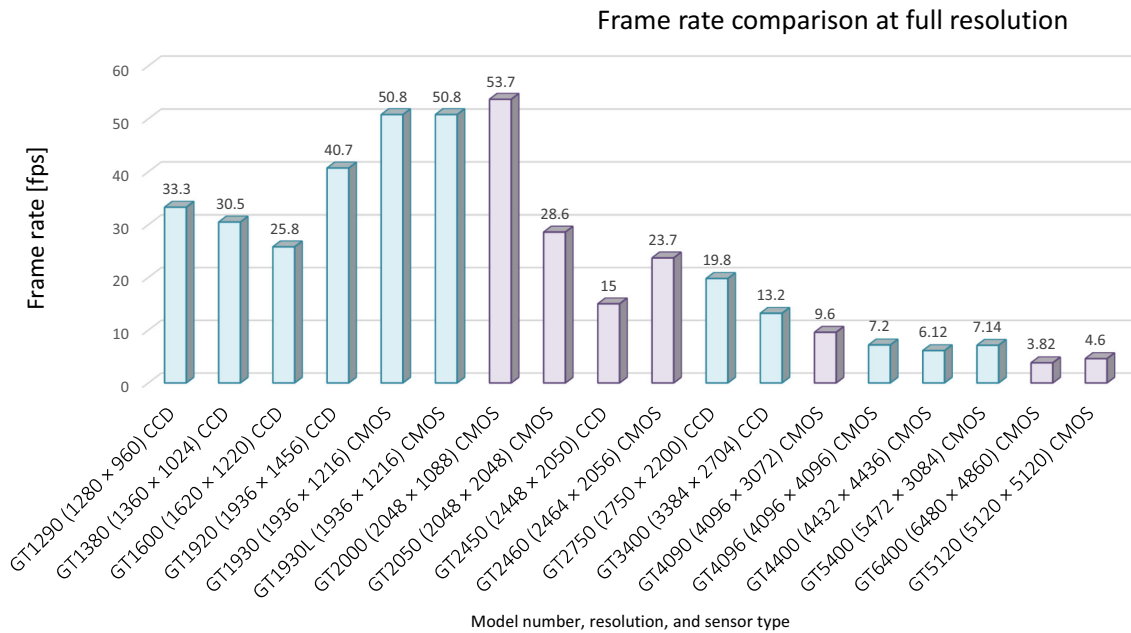


Figure 62: Frame rate comparison

# Camera feature comparison

Prosilica GT cameras support a number of standard and extended features. The following table identifies a selection of capabilities and compares the availability of features in Prosilica GT camera models. Some features are firmware dependent, refer to the GigE Firmware Release Notes for more information.

## Standard and extended format models

Image optimization features	GT1290	GT1380	GT1600	GT1920	GT1930	GT2000	GT2050	GT2450	GT2460	GT2750	GT3400
Auto gain	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Auto exposure	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Auto white balance (color models only)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Binning	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
Black level (offset)	✗	✗	✗	✗	✓	✓	✓	✗	✓	✗	✗
Hue, saturation, color correction (color models only)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Column Defect Masking <sup>1,2</sup>	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✓
Pixel Defect Masking <sup>3</sup>	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗
Decimation X/Y	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gamma correction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Three look-up tables <sup>4</sup>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Piecewise Linear HDR mode	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗
Reverse X	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Reverse Y	✗	✗	✗	✓	✓	✓	✓	✗	✓	✓	✓
Region of Interest	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

<sup>1</sup> CCD models only: Column defect masking supported for quad-tap cameras running in single-tap mode.

<sup>2</sup> For more information, see the Load Defect Tables Tool application note.

<sup>3</sup> For more information, see the Defect Mask Loader Tool application note.

<sup>4</sup> Prosilica GT4400, GT5400, and GT6400 series have one look-up table.

Table 57: Image optimization feature comparison by model



Camera control features	GT1290	GT1380	GT1600	GT1920	GT1930	GT2000	GT2050	GT2450	GT2460	GT2750	GT3400
P-Iris and DC-Iris lens control	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Event channel	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Image chunk data	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IEEE 1588 Precision Time Protocol	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RS232	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Storable user sets (config files)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stream hold	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sync out modes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tap mode switchable in Vimba Viewer 2.0 or later	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✓
Temperature monitoring (main board and sensor board)	✓	✓	✓	✓	✓	✓ <sup>1</sup>	✓ <sup>1</sup>	✓	✓	✓	✓
Trigger over Ethernet (ToE)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

<sup>1</sup> Temperature readout only available on the main board and not on the sensor board.

Table 58: Camera control feature comparison by model

## Large Format models

Image optimization features	GT1930L	GT4090	GT4096	GT4400	GT5120	GT5400	GT6400
Auto gain	✓	✓	✓	✓	✓	✓	✓
Auto exposure	✓	✓	✓	✓	✓	✓	✓
Auto white balance (color models only)	✓	✗	✗	✓	✗	✓	✓
Binning	✓	✗	✗	✓	✗	✓	✓
Black level (offset)	✓	✓	✓	✓	✓	✓	✓
Hue, saturation, color correction (color models only)	✓	✗	✗	✓	✗	✓	✓
Defect Pixel Correction <sup>1</sup>	✗	✓	✓	✗	✓	✗	✗
Pixel Defect Masking	✗	✗	✗	✓	✗	✓	✓
Decimation X/Y	✓	✓	✓	✓	✓	✓	✓
Fixed Pattern Noise Correction	✗	✓	✓	✗	✓	✗	✗
Gamma correction	✓	✓	✓	✓	✓	✓	✓
Three look-up tables	✓	✓	✓	✓	✓	✓	✓

Table 59: Image optimization feature comparison by model (sheet 1 of 2)

<b>Image optimization features</b>	<b>GT1930L</b>	<b>GT4090</b>	<b>GT4096</b>	<b>GT4400</b>	<b>GT5120</b>	<b>GT5400</b>	<b>GT6400</b>
Reverse X	✓	✗	✗	✓	✗	✓	✓
Reverse Y	✓	✗	✗	✓	✗	✓	✓
Region of Interest	✓	✓	✓	✓	✓	✓	✓

<sup>1</sup> For more information, see the Defective Pixel List Management Tool for Prosilica GT models with PYTHON sensor application note.

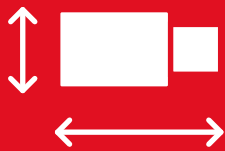
Table 59: Image optimization feature comparison by model (sheet 2 of 2)

<b>Camera control features</b>	<b>GT1930L</b>	<b>GT4090</b>	<b>GT4096</b>	<b>GT4400</b>	<b>GT5120</b>	<b>GT5400</b>	<b>GT6400</b>
P-Iris and DC-Iris lens control	✗	✗	✗	✗	✗	✗	✗
EF lens control <sup>1</sup>	✓	✓	✓	✓	✓	✓	✓
Event channel	✓	✓	✓	✓	✓	✓	✓
Image chunk data	✓	✓	✓	✓	✓	✓	✓
IEEE 1588 Precision Time Protocol	✓	✓	✓	✓	✓	✓	✓
RS232	✓	✓	✓	✓	✓	✓	✓
Storable user sets (config files)	✓	✓	✓	✓	✓	✓	✓
Stream hold	✓	✓	✓	✓	✓	✓	✓
Sync out modes	✓	✓	✓	✓	✓	✓	✓
Temperature monitoring (main board and sensor board)	✓	✓	✓	✓	✓	✓	✓
Trigger over Ethernet (ToE)	✓	✓	✓	✓	✓	✓	✓

<sup>1</sup> EF lens control is only supported for models with EF lens mount (order option-18).

Table 60: Camera control feature comparison by model

# Mechanical dimensions



This chapter includes:

- Mechanical drawings and dimensions of standard, 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:

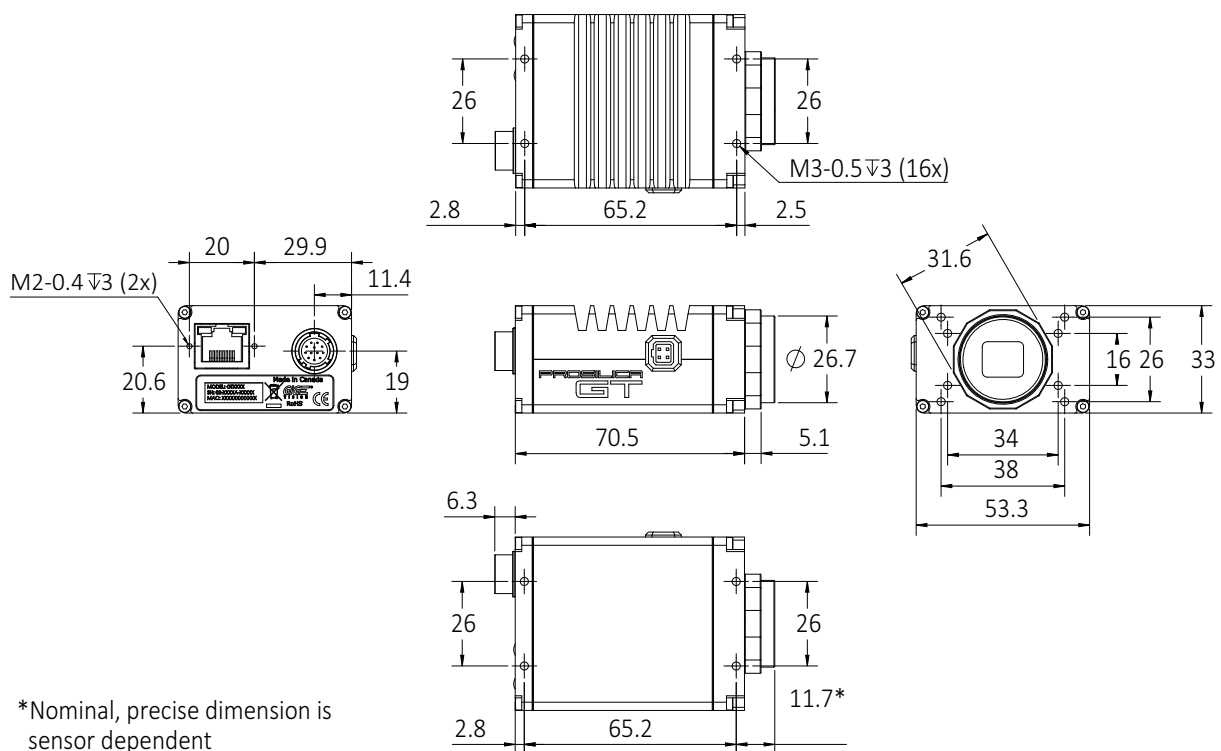
- Prosilica GT standard format housing
- Prosilica GT extended format housing
- Prosilica GT Large Format housing

Prosilica GT cameras are available with various lens mount options. For more information, see the Modular Concept document

## Standard format housing

### C-Mount (default)

Model series: Prosilica GT1290, GT1380, GT1600, GT2000, GT2050, GT2450, GT2460



\*Nominal, precise dimension is sensor dependent

Figure 63: C-Mount standard format housing dimensions

Model series: Prosilica GT1930

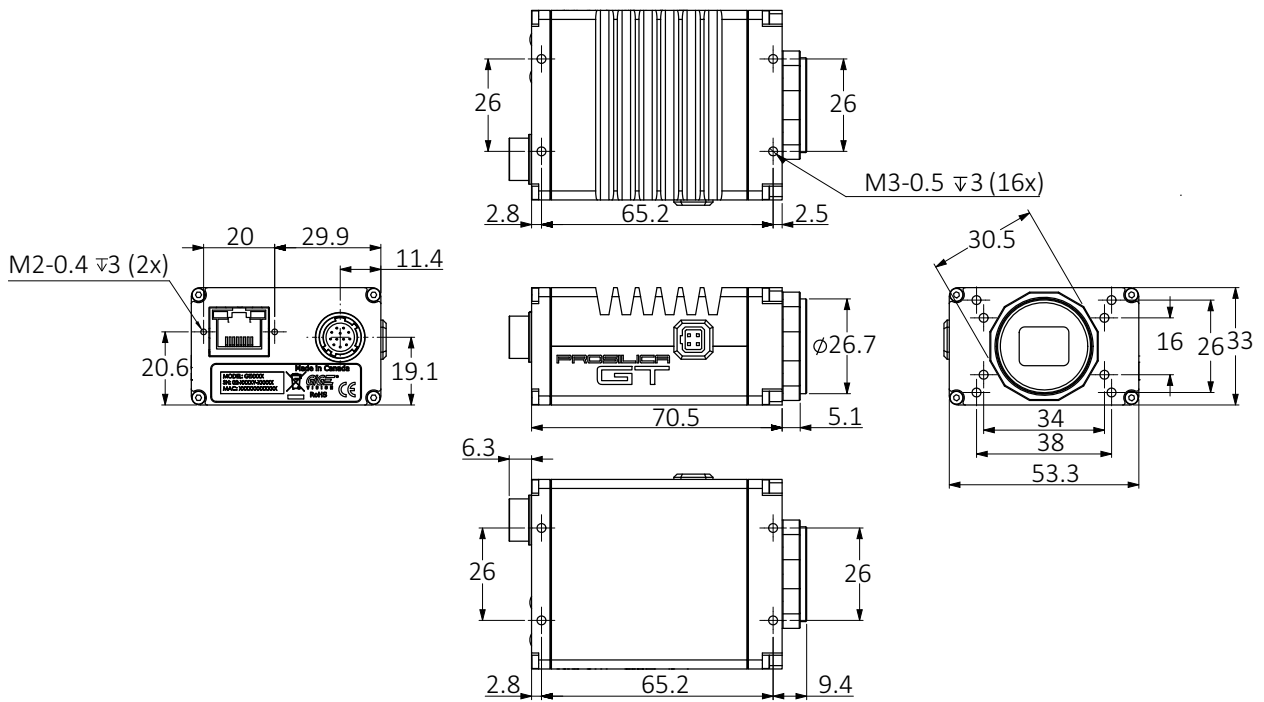


Figure 64: Prosilica GT1930 C-Mount standard format housing dimensions

## CS-Mount

Model series: Prosilica GT1290, GT1380, GT1600, GT2000, GT2050, GT2450, GT2460

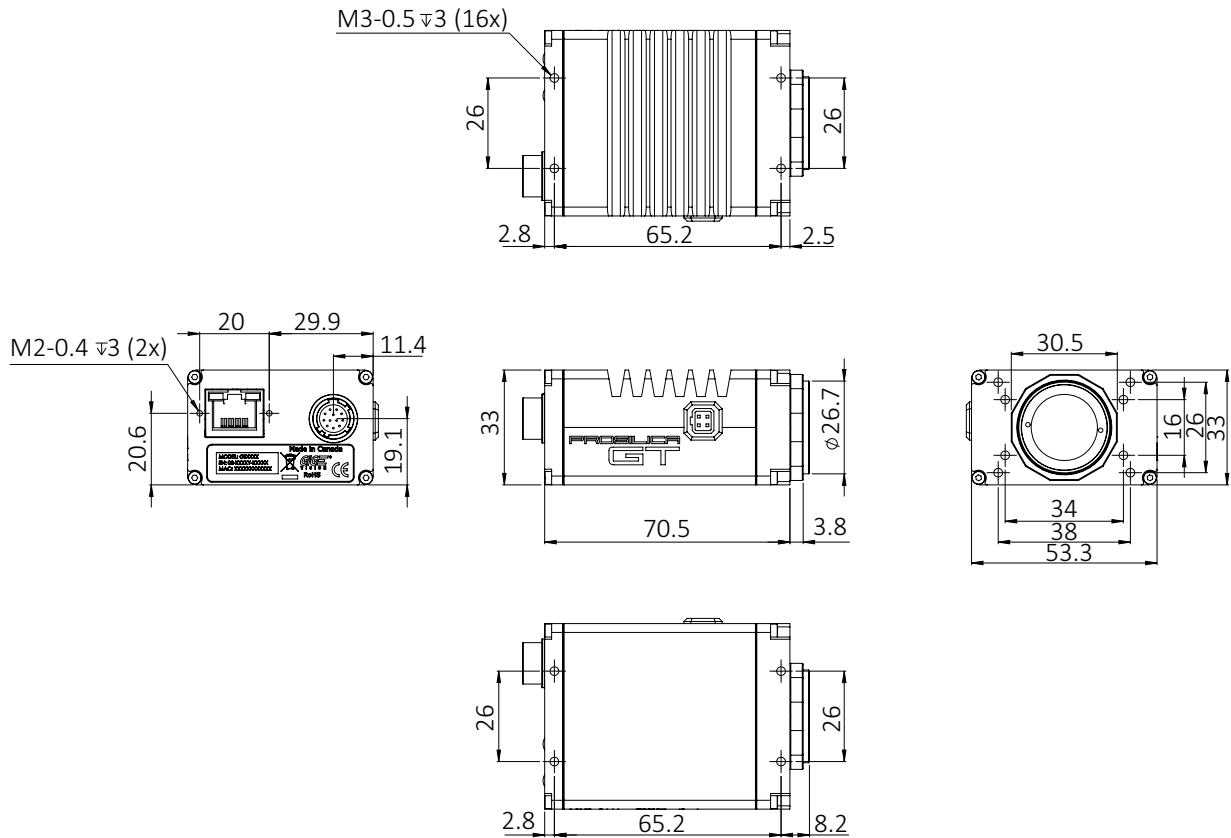


Figure 65: CS-Mount standard format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT standard housing camera with CS-Mount option (order code Prosilica GT...-01).

Model series: Prosilica GT1930

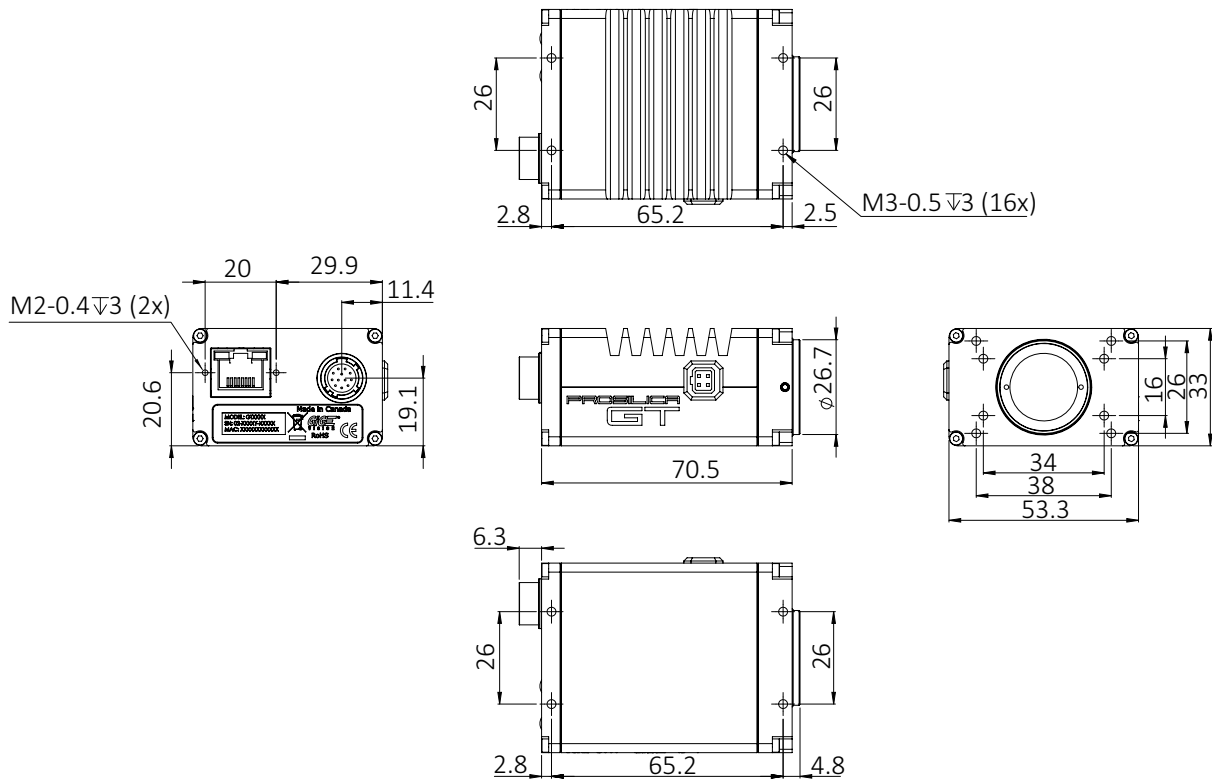


Figure 66: Prosilica GT1930 CS-Mount standard format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT1930 standard housing camera with CS-Mount option (order code Prosilica GT...-01).

# Extended format housing

## C-Mount

Model series: Prosilica GT1920, GT2750, GT3400 (default)

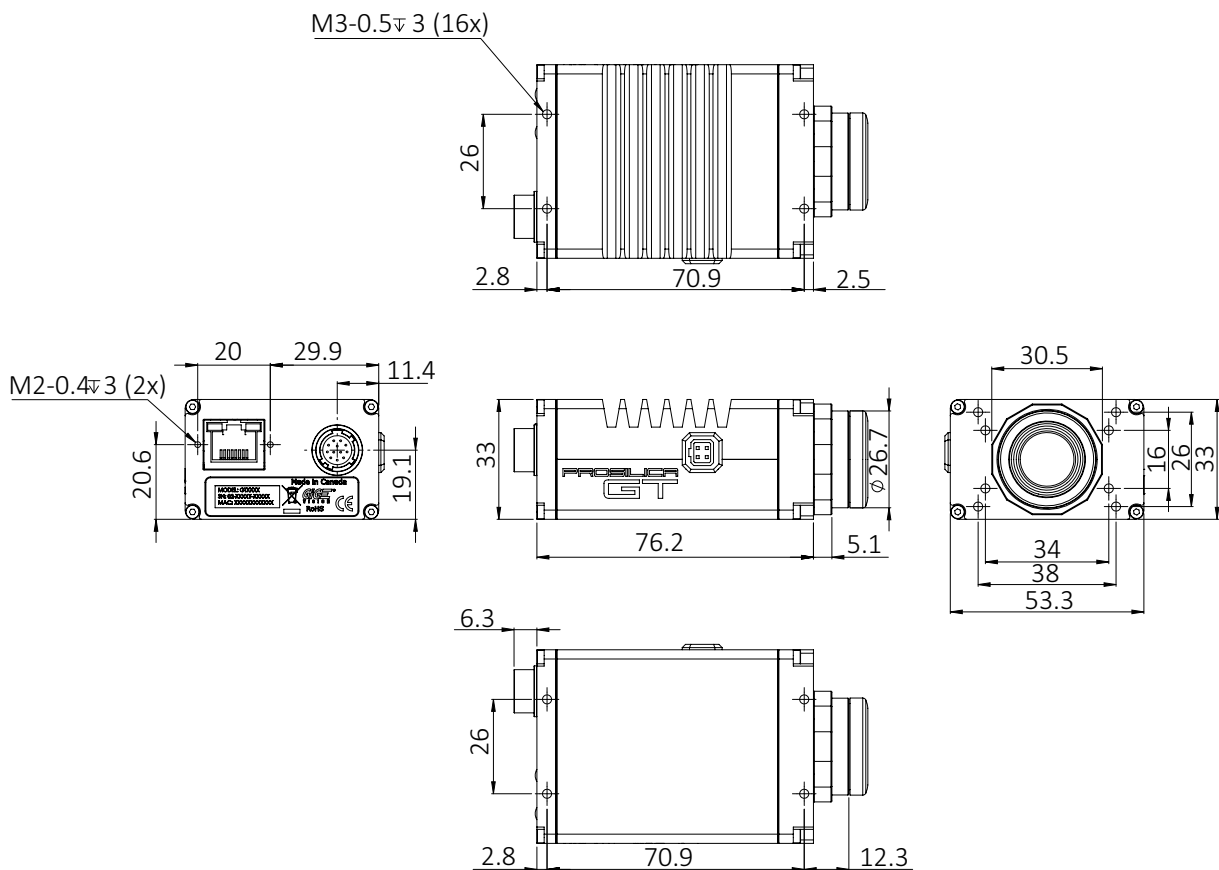


Figure 67: C-Mount extended format housing dimensions



## CS-Mount

Model series: Prosilica GT1920, GT2750, GT3400

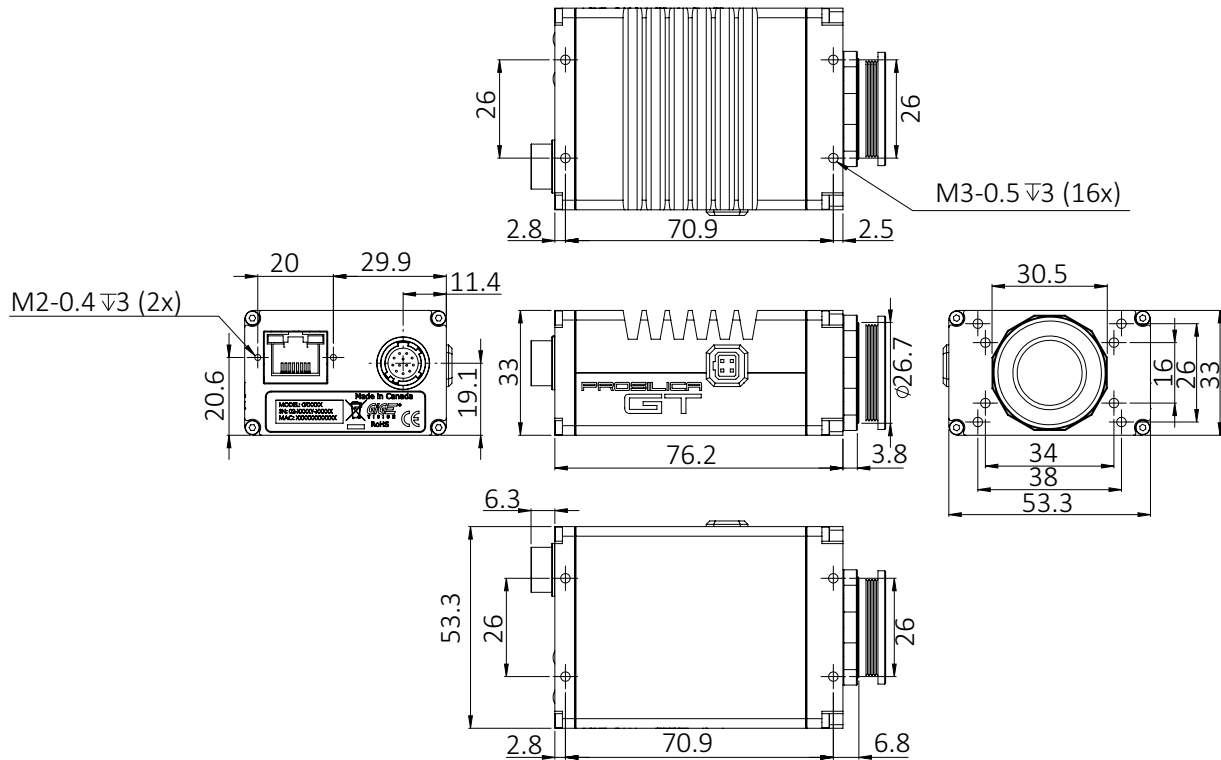


Figure 68: CS-Mount extended format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT extended housing camera with CS-Mount option (order code Prosilica GT...-07).

## Birger EF-Mount

Model series: Prosilica GT1920, GT2750, GT3400

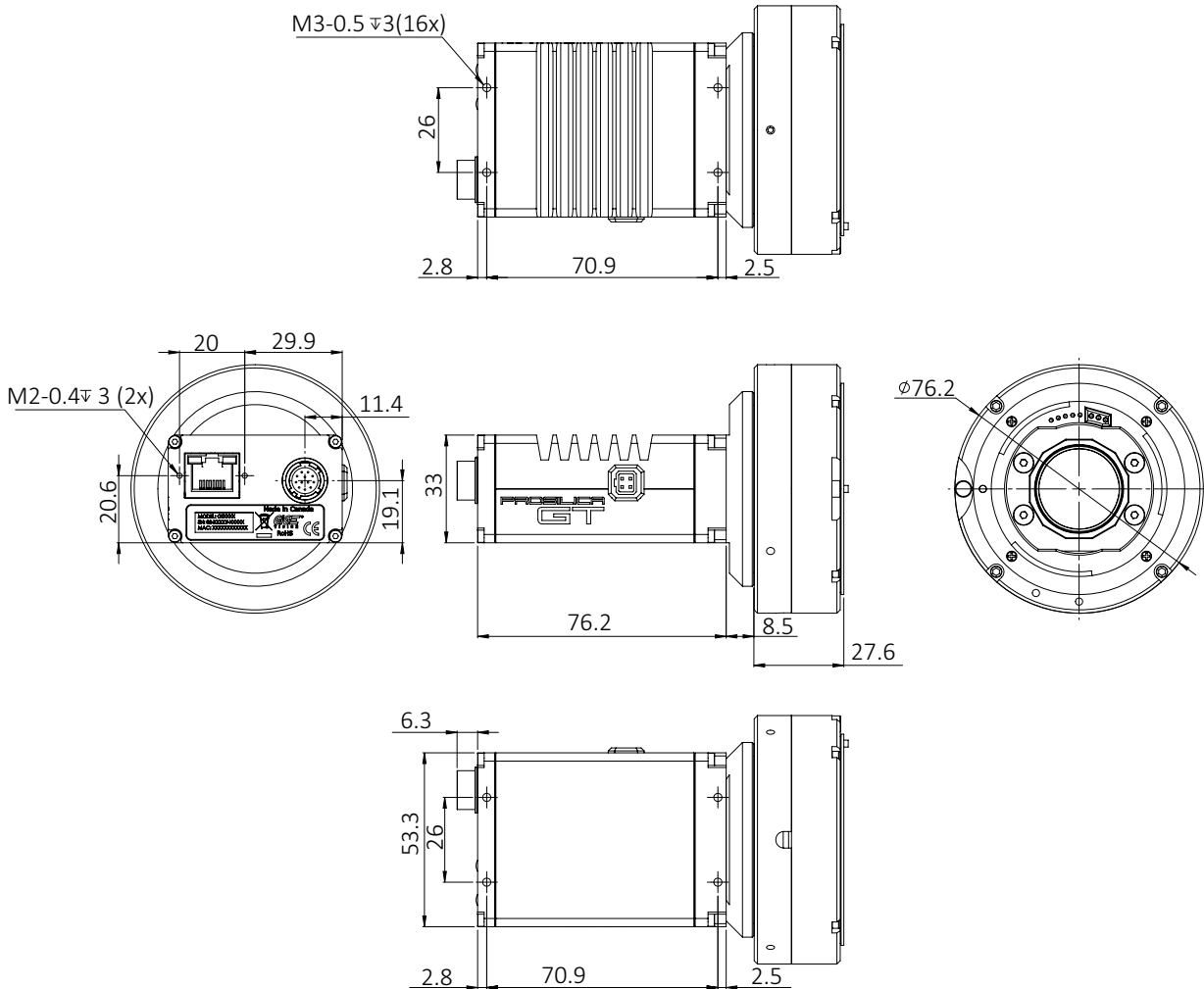


Figure 69: Birger EF-Mount extended format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT extended format housing camera with Birger EF-Mount option (order code Prosilica GT...-09).

## F-Mount

Model series: Prosilica GT1920, GT2750, GT3400 (optional)

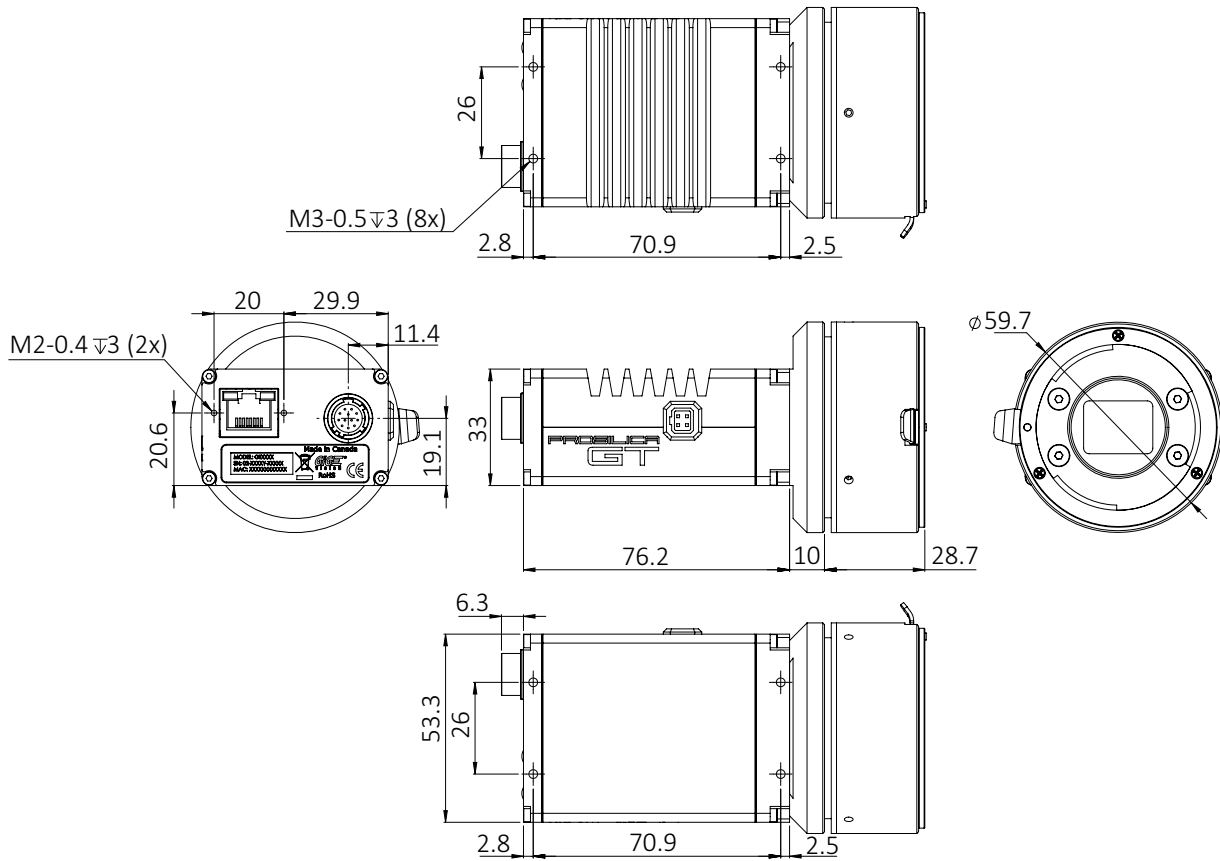


Figure 70: F-Mount extended format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT extended housing camera with F-Mount option (order code Prosilica GT...-03).

## M42-Mount

Model series: Prosilica GT1920, GT2750, GT3400

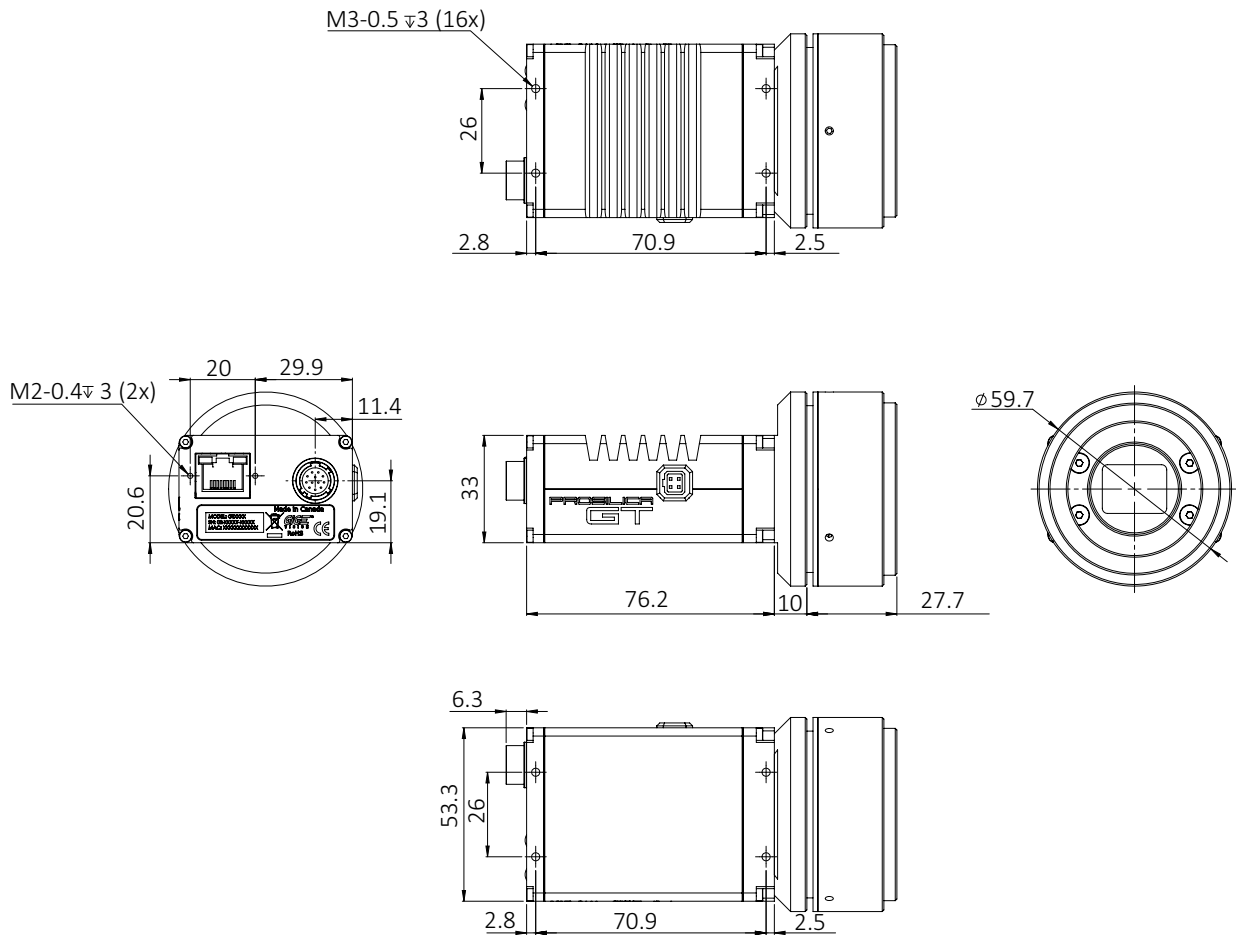


Figure 71: M42-Mount extended format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT extended format housing camera with M42-Mount option (order code Prosilica GT...-31).

# Large Format housing

## C-Mount

Model series: Prosilica GT4400 and GT5400

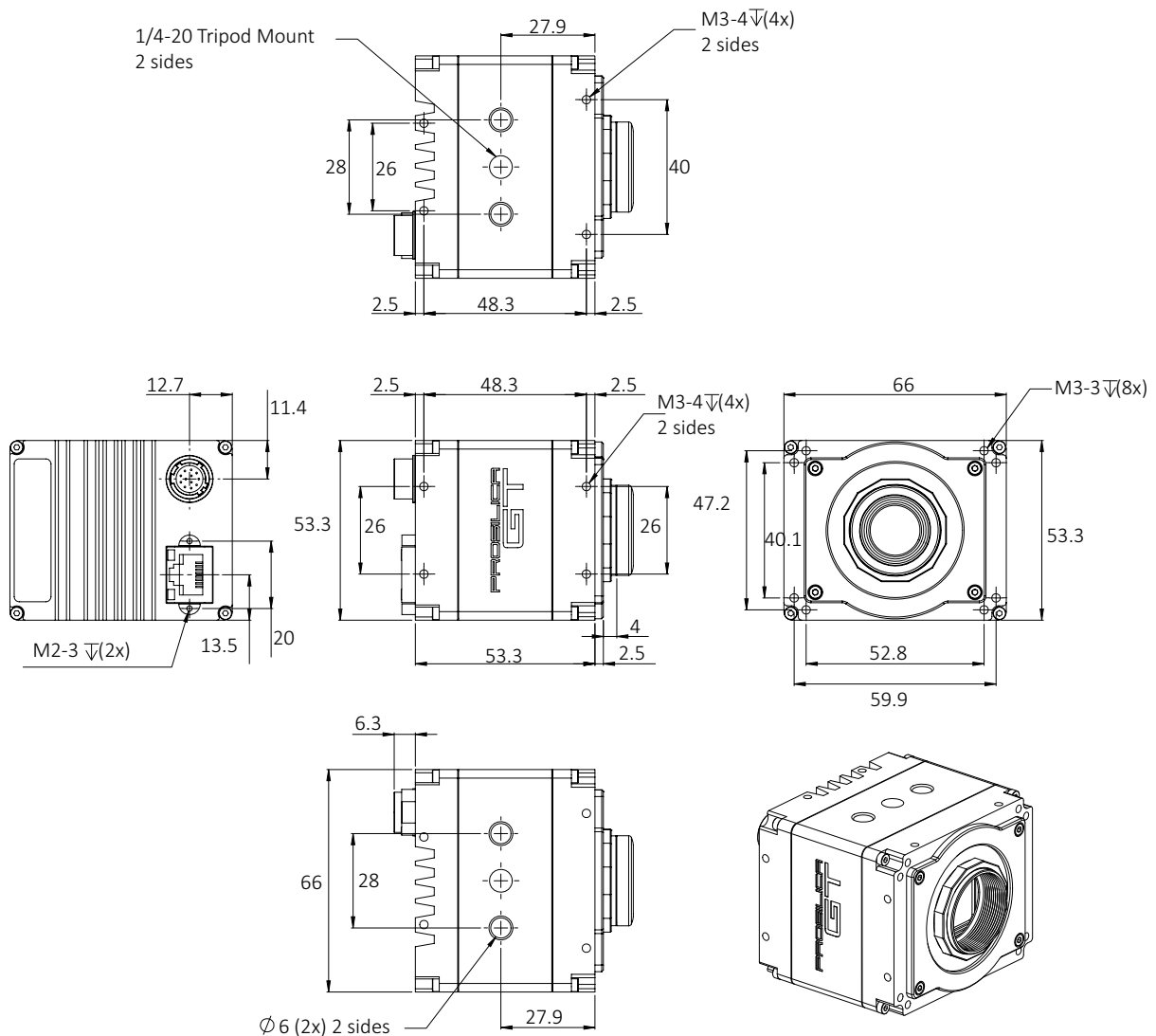


Figure 72: C-Mount Large Format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT series camera with C-Mount option (order code Prosilica GT...-07).

## EF-Mount PA

Model series: Prosilica GT1930L, GT4090, GT4096, GT5120

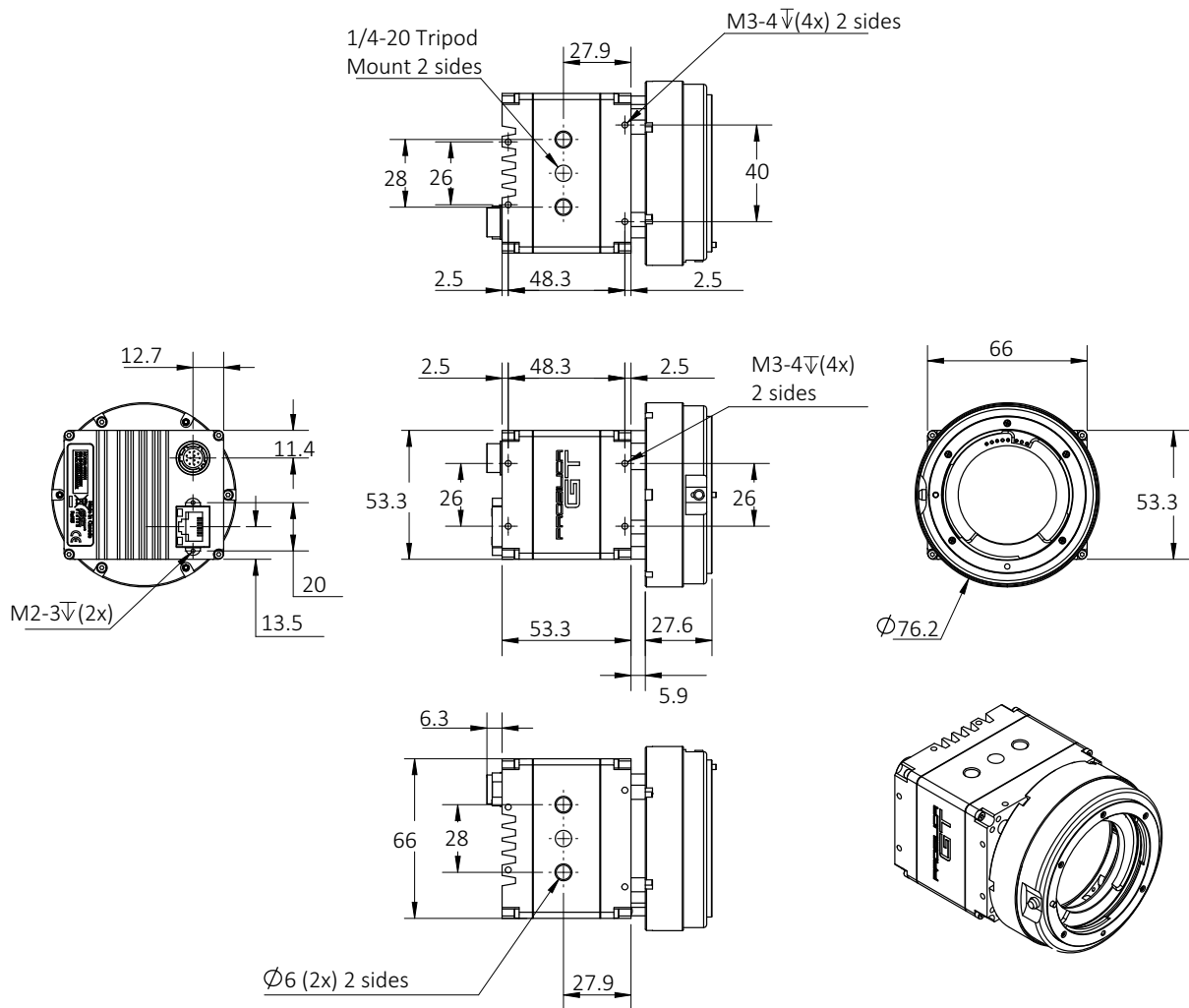


Figure 73: EF-Mount PA Large Format housing dimensions

Model series: Prosilica GT4400, GT5400, GT6400

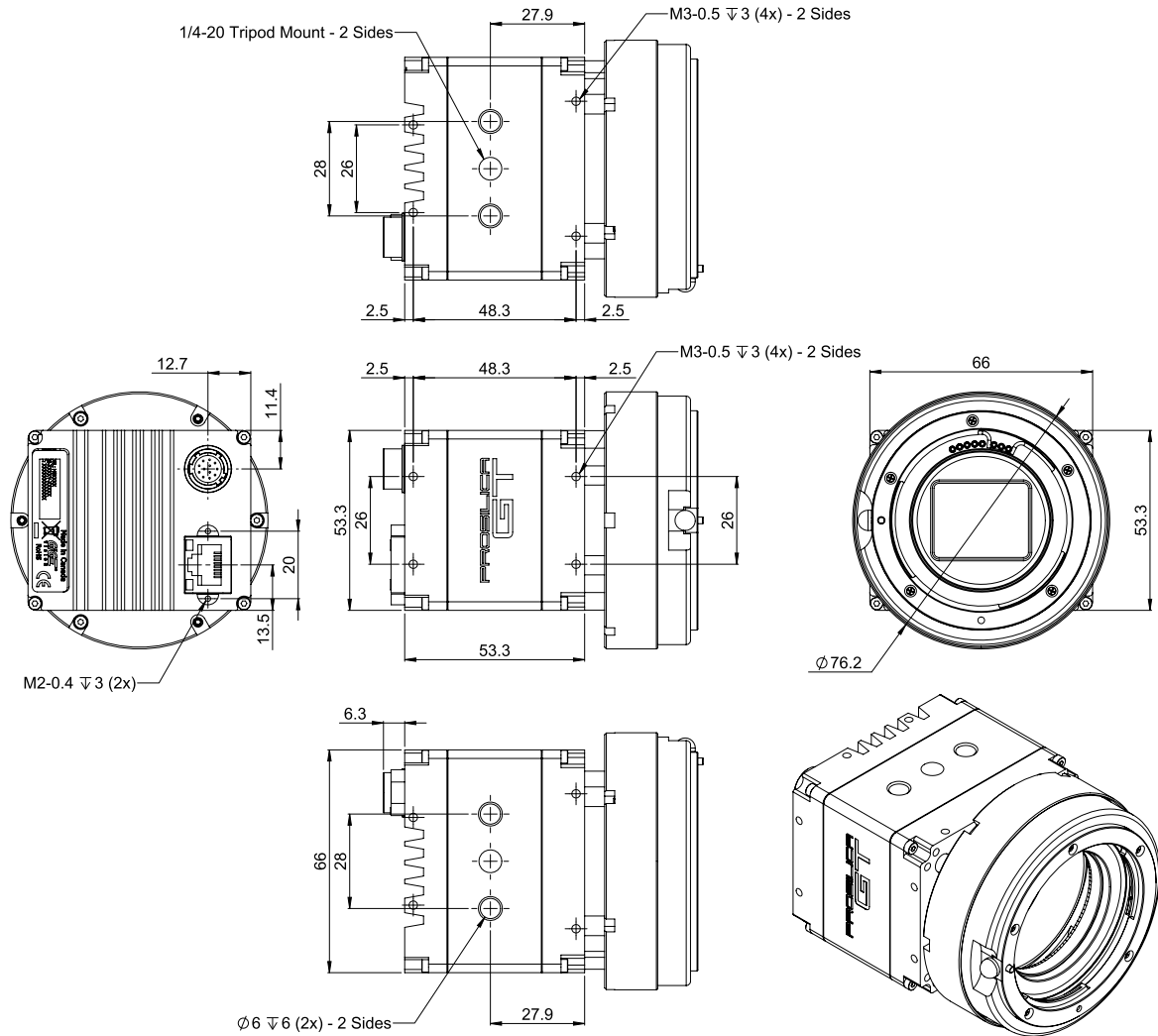


Figure 74: EF-Mount PA Large Format housing (GT4400, GT5400, GT6400) dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT series camera with EF-Mount PA option (order code Prosilica GT...-18).

## F-Mount (default)

Model series: Prosilica GT1930L, GT4090, GT4096, GT5120

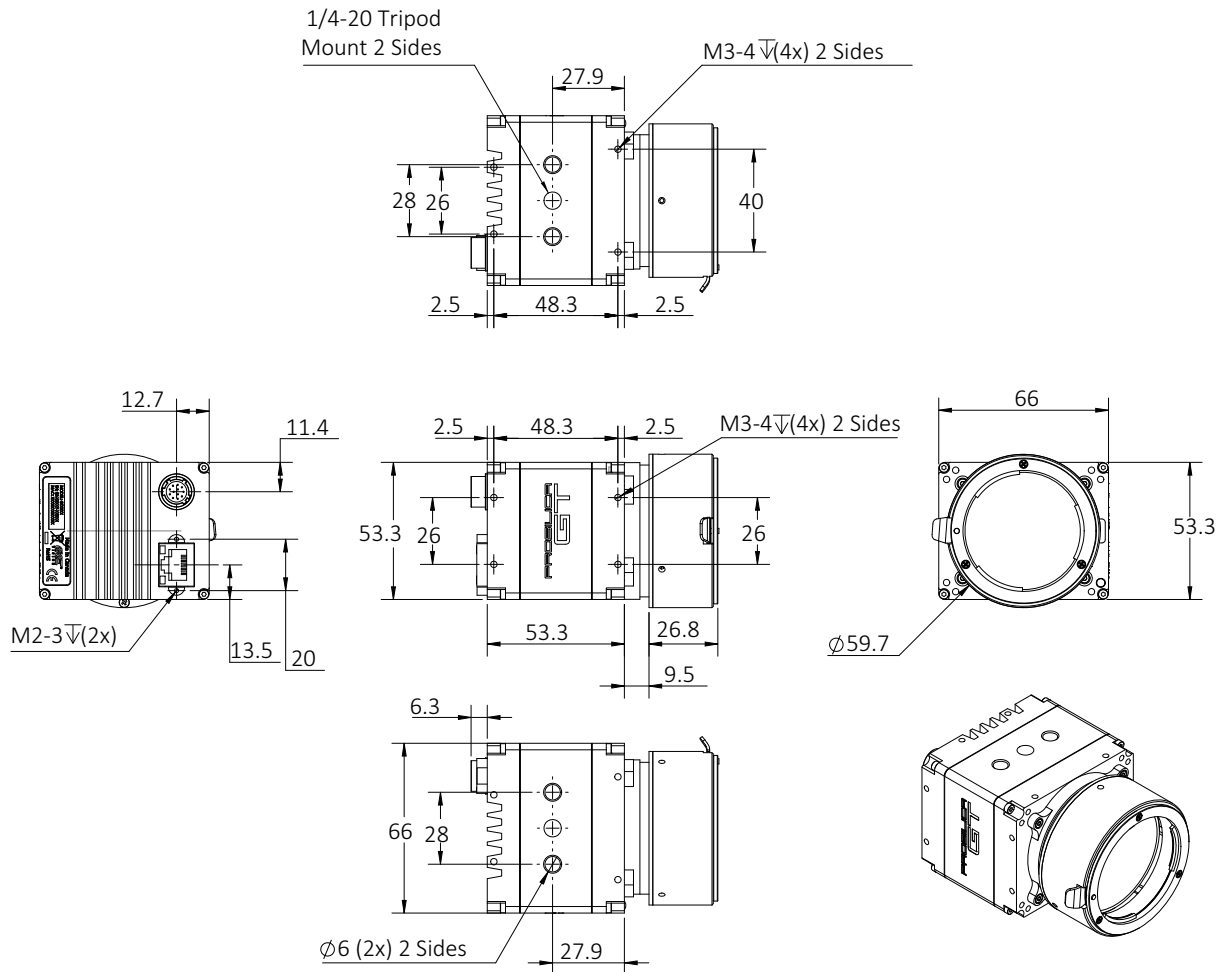


Figure 75: F-Mount Large Format housing dimensions



Model series: Prosilica GT4400, GT5400, GT6400

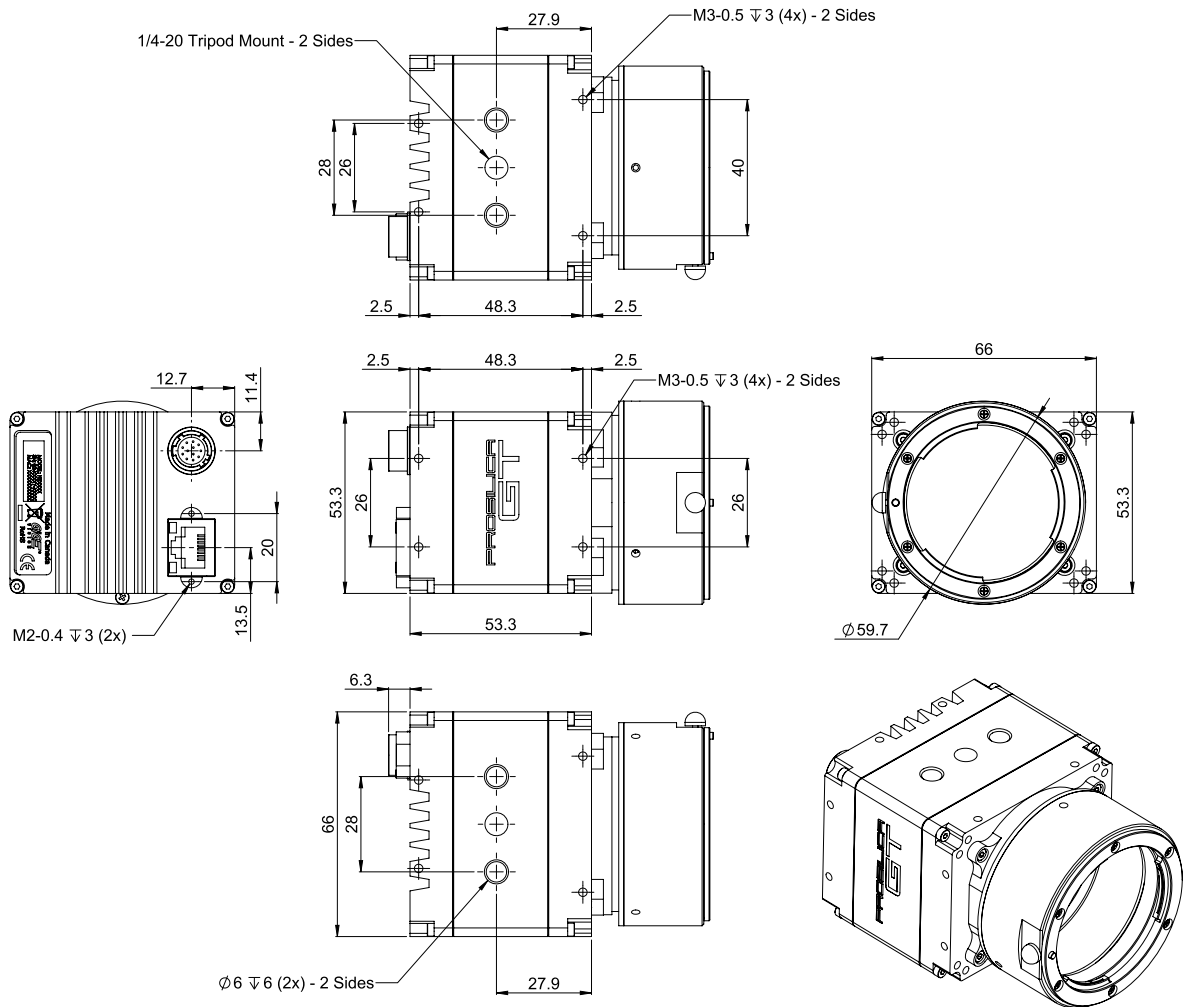


Figure 76: F-Mount Large Format housing (GT4400, GT5400, GT6400) dimensions

## F-Mount PA

Model series: Prosilica GT1930L, GT4090, GT4096, GT5120

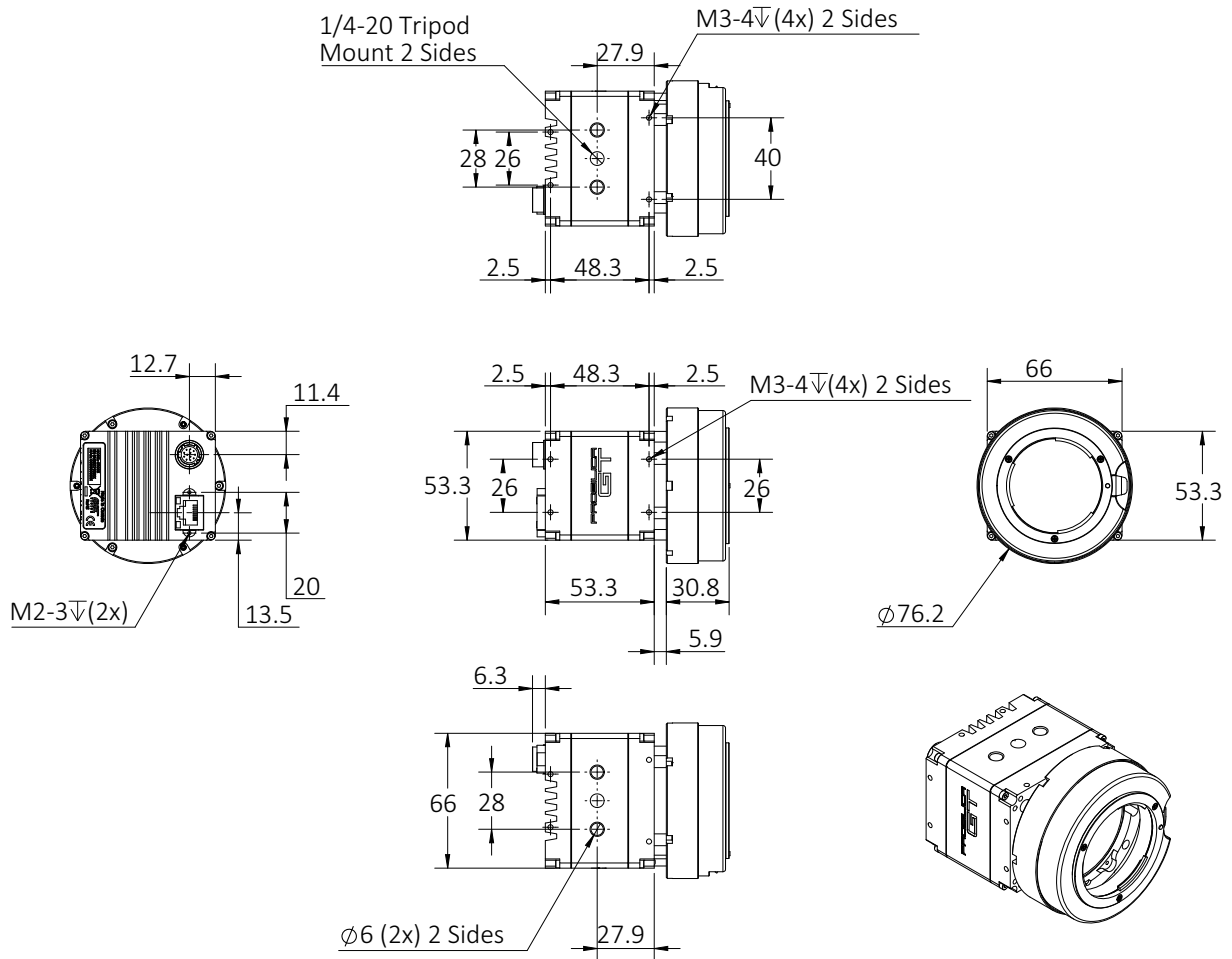


Figure 77: F-Mount PA Large Format housing dimensions

Model series: Prosilica GT4400, GT5120, GT5400, GT6400

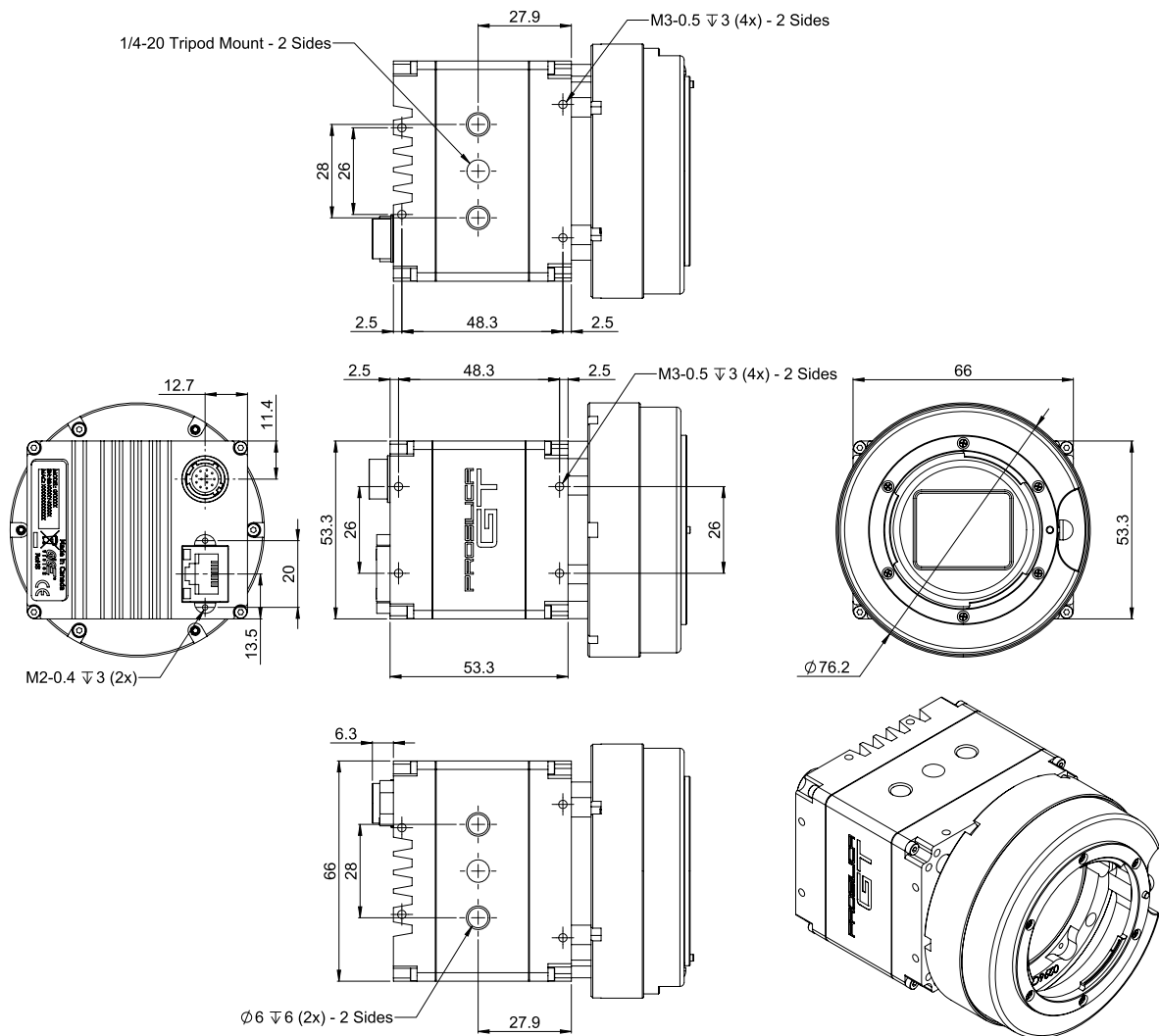


Figure 78: F-Mount PA Large Format housing (GT4400, GT5400, GT6400) dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT series camera with F-Mount PA option (order code Prosilica GT...-03).

## M42-Mount PA

Model series: Prosilica GT1930L, GT4090, GT4096, GT4400, GT5120, GT5400, GT6400

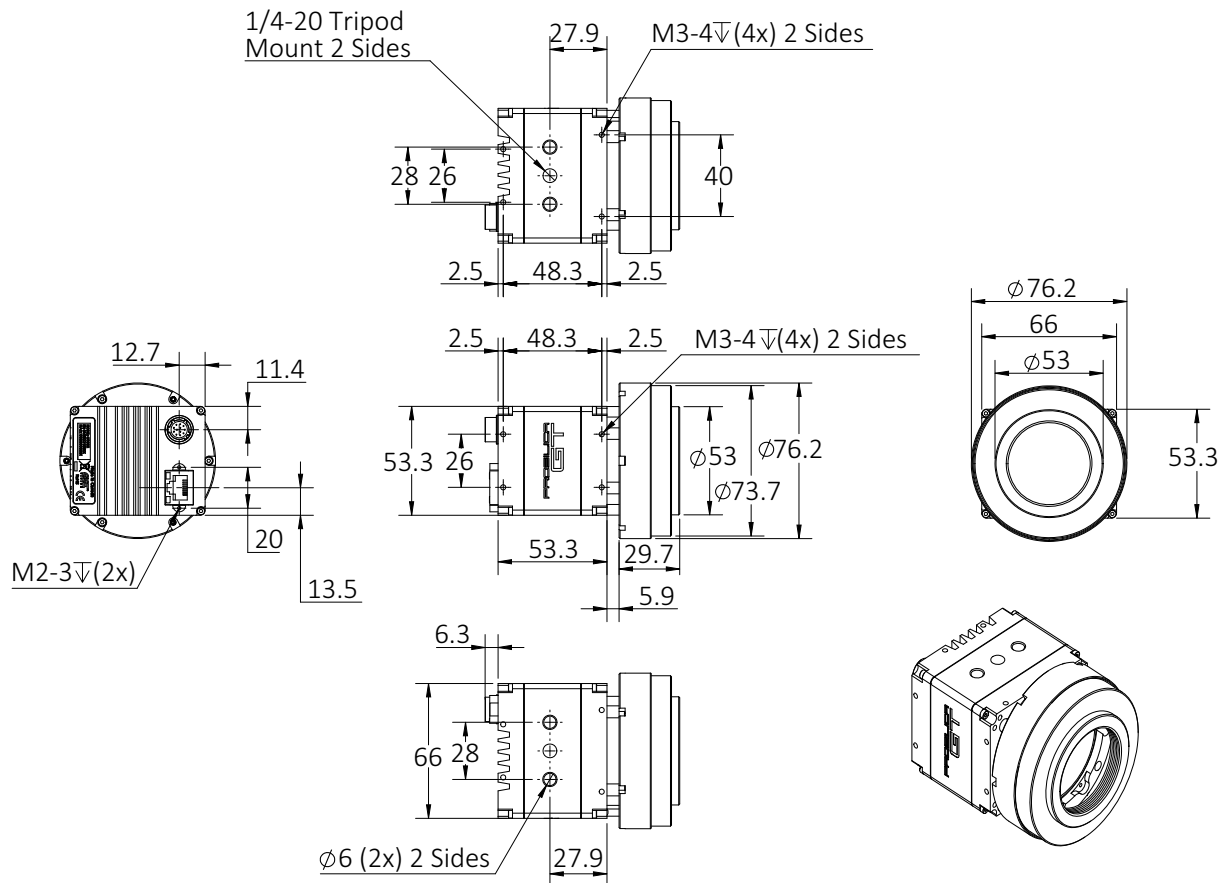


Figure 79: M42-Mount PA Large Format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT series camera with M42-Mount PA option (order code Prosilica GT...-25).

## M42-Mount

Model series: Prosilica GT1930L, GT4090, GT4096, GT4400, GT5120, GT5400, GT6400

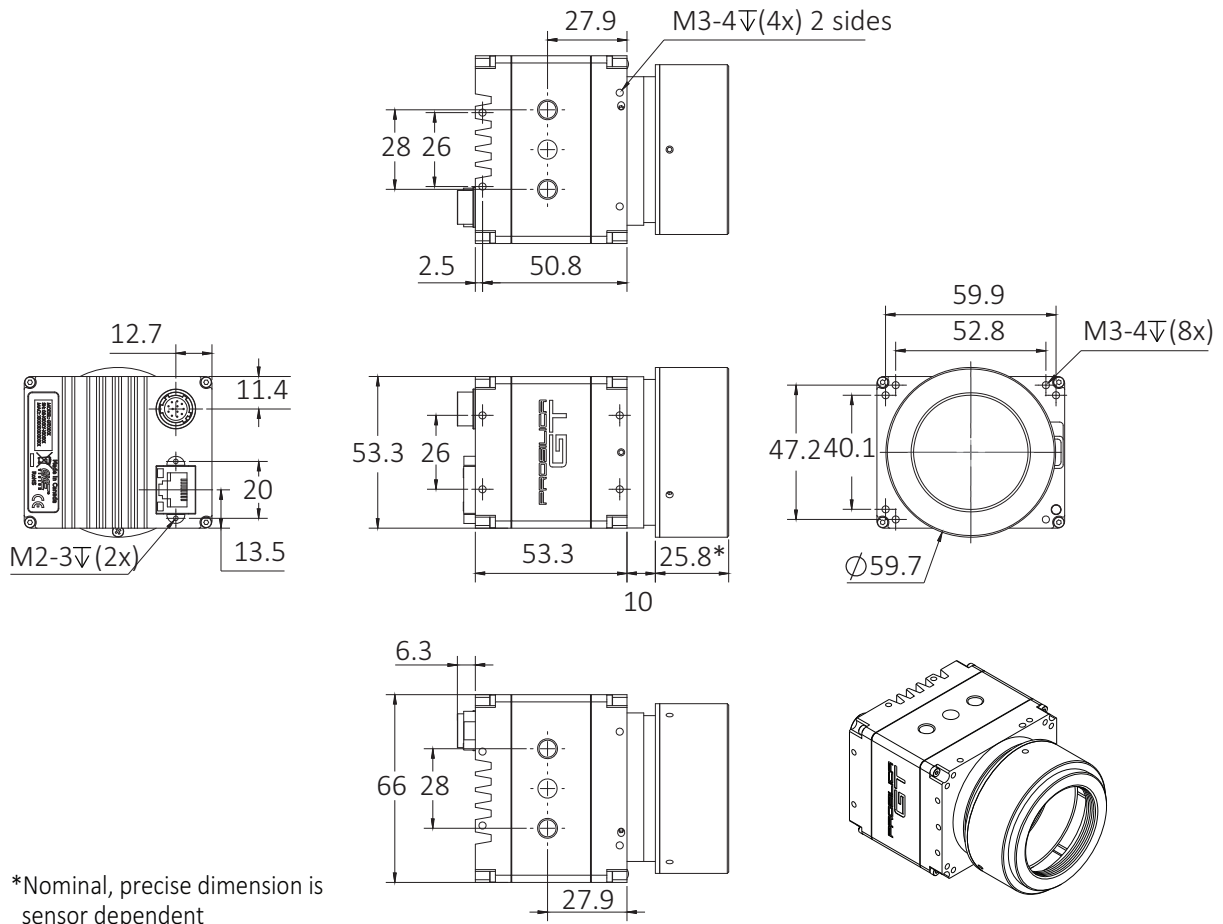


Figure 80: M42-Mount Large Format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT series camera with M42-Mount option (order code Prosilica GT...-31).

## M58-Mount PA

Model series: Prosilica GT1930L, GT4090, GT4096, GT4400, GT5120, GT5400, GT6400

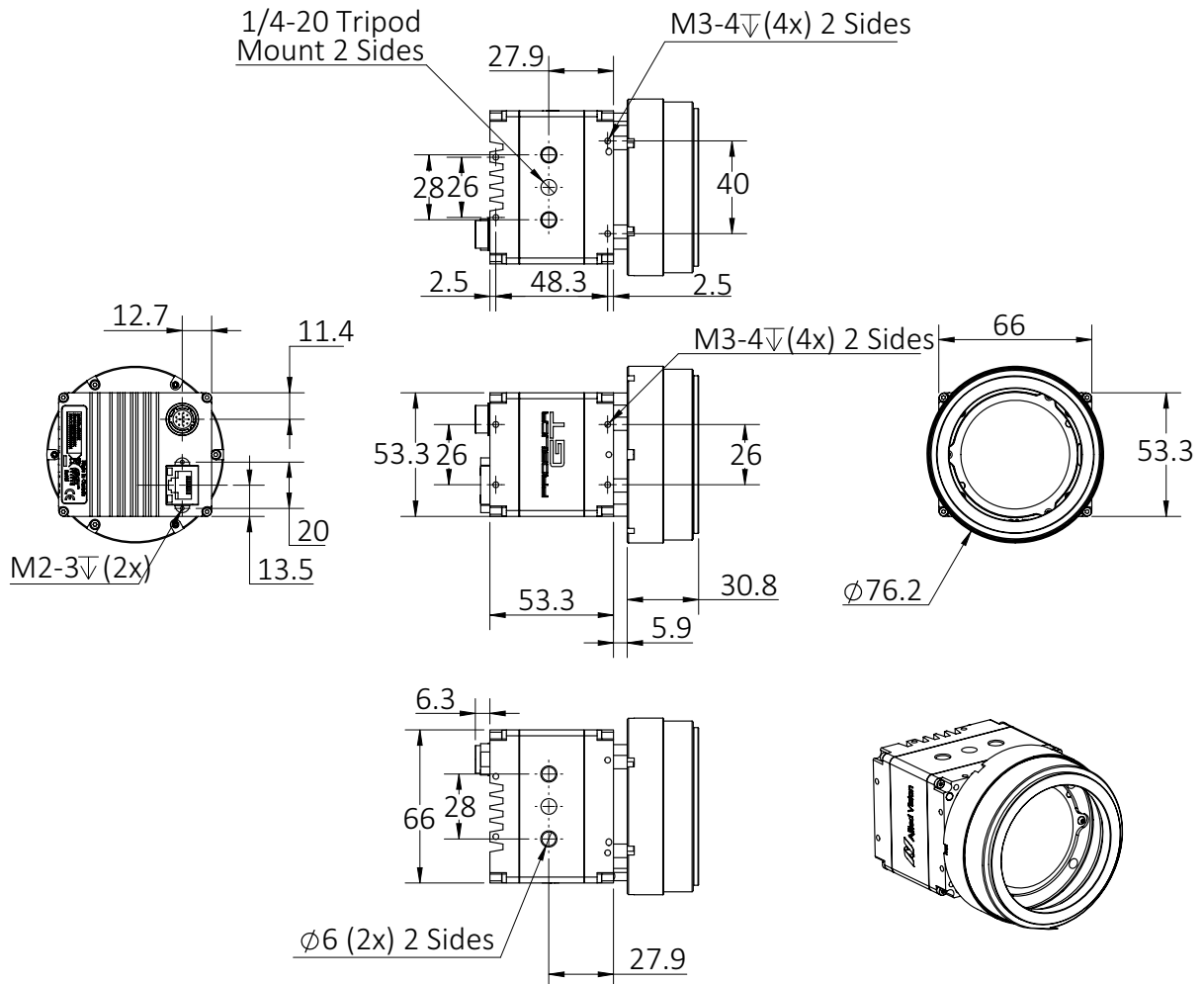


Figure 81: M58-Mount PA Large Format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT series camera with M58-Mount PA option (order code Prosilica GT...-13).

## M58-Mount

Model series: Prosilica GT1930L, GT4090, GT4096, GT4400, GT5120, GT5400, GT6400

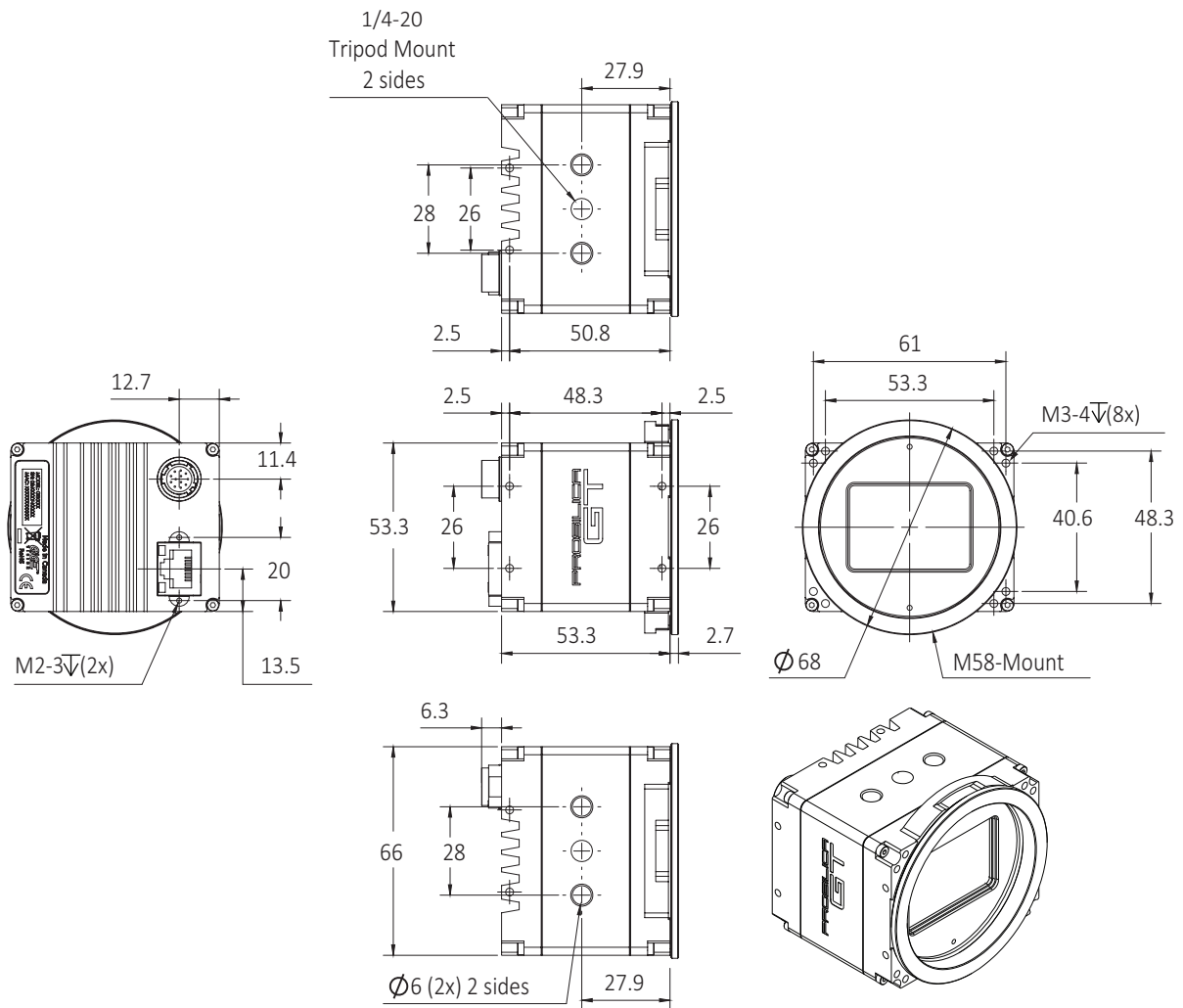


Figure 82: M58-Mount Large Format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT series camera with M58-Mount option (order code Prosilica GT...-12).

## TFL-Mount (35mm × 0.75)

Model series: Prosilica GT4400, GT5400, GT6400

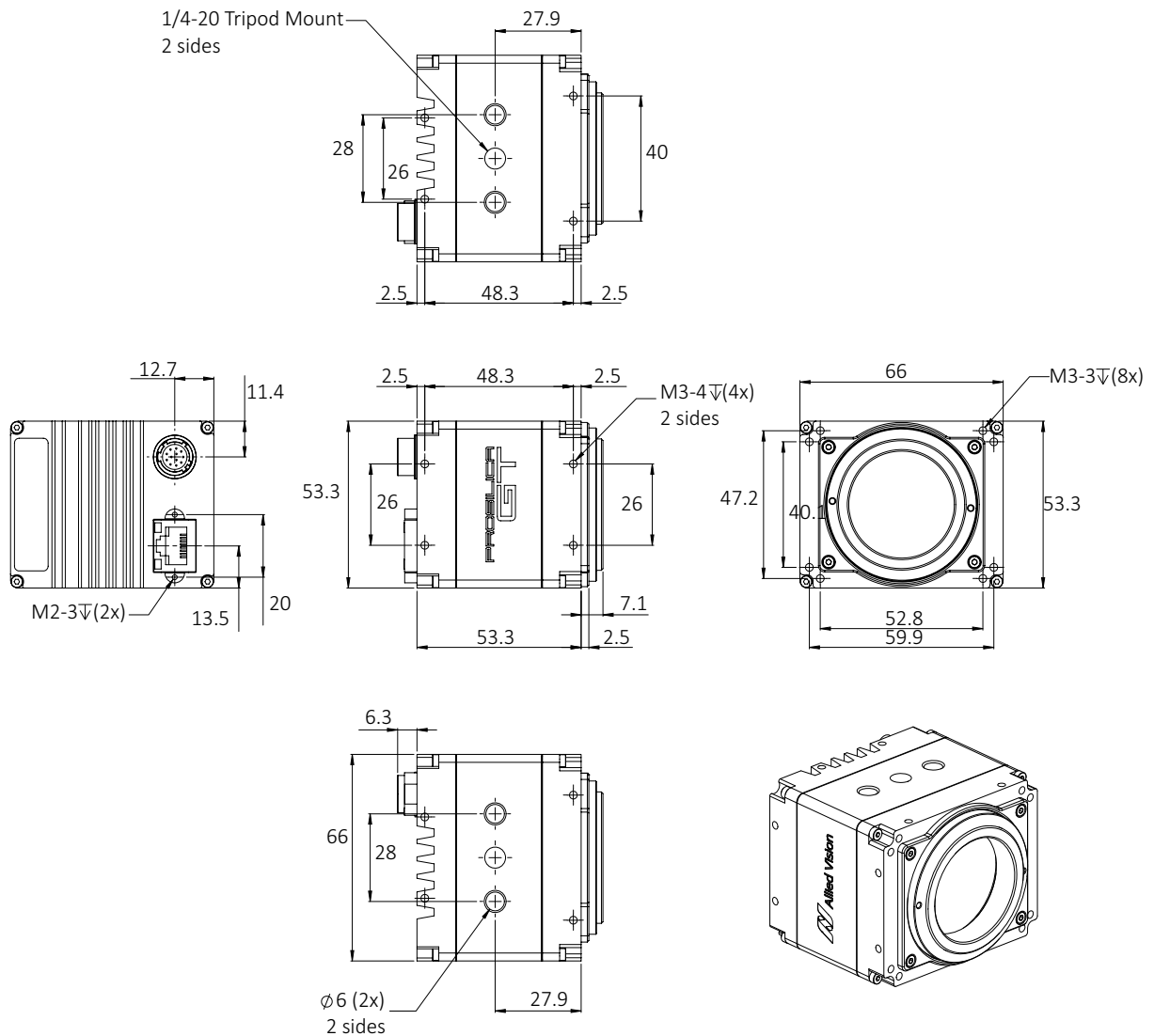


Figure 83: TFL-Mount Large Format housing dimensions



Contact the Allied Vision Sales team to purchase the Prosilica GT series camera with TFL Mount option (order code Prosilica GT...-40).



# Tripod adapter

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



Contact the Allied Vision Sales team to purchase the Prosilica GT series tripod adapter (order code 02-5036A).

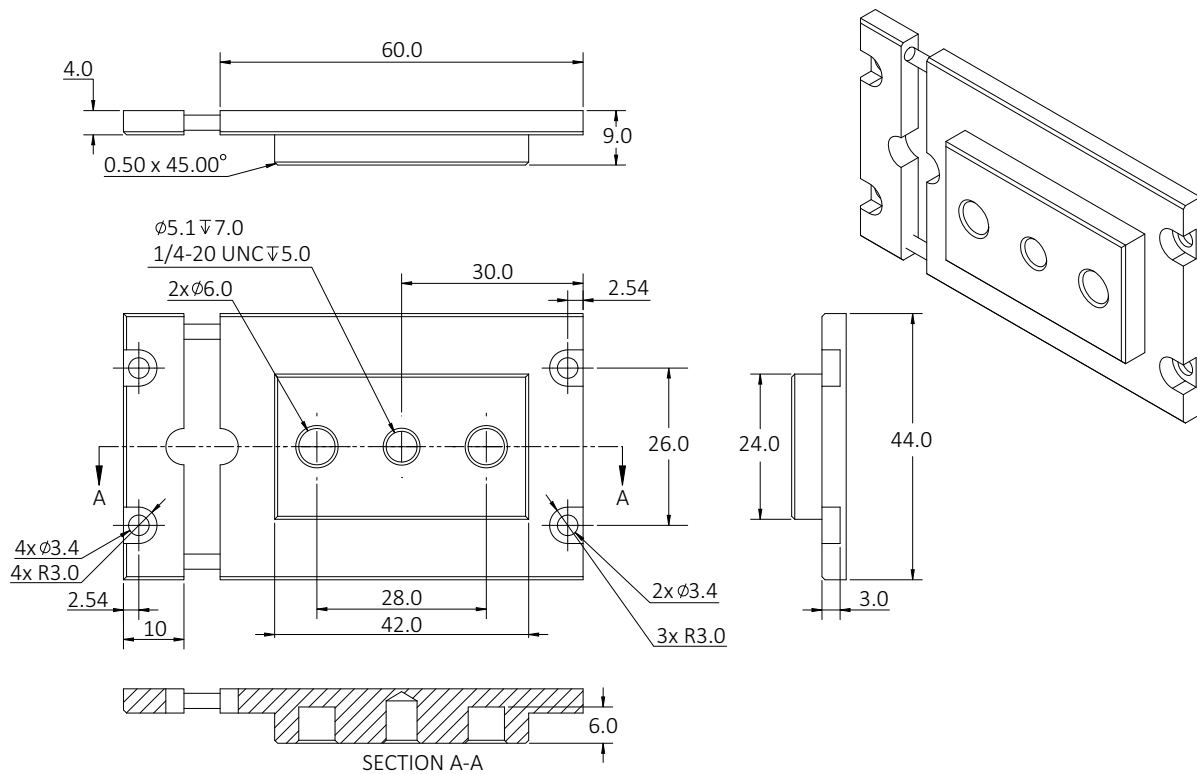
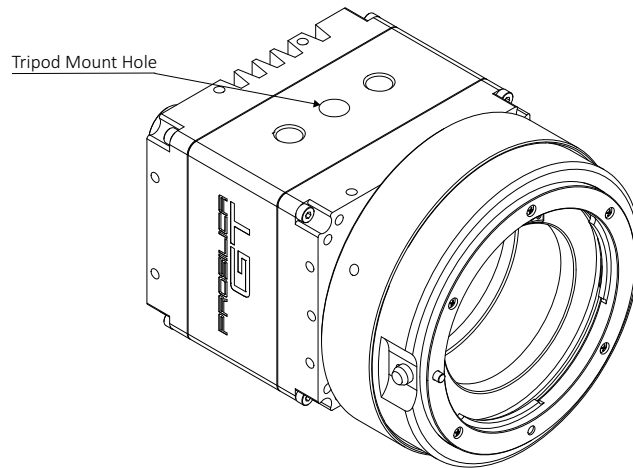


Figure 84: Tripod adapter for Prosilica GT standard and extended cameras

## 1/40-20 tripod mount for Large Format cameras

Prosilica GT Large Format cameras can be mounted on a camera tripod by using the 1/4-20 tripod mount thread integrated into the camera housing.



*Figure 85: Integrated tripod mount threads for Prosilica GT Large Format cameras*

# Lens protrusion

## Standard and extended format cameras

### C-Mount

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 or IR pass filter holder. For monochrome cameras, this surface is the internal camera front plate. The following table presents lens protrusion values for Prosilica GT cameras with C-Mount.

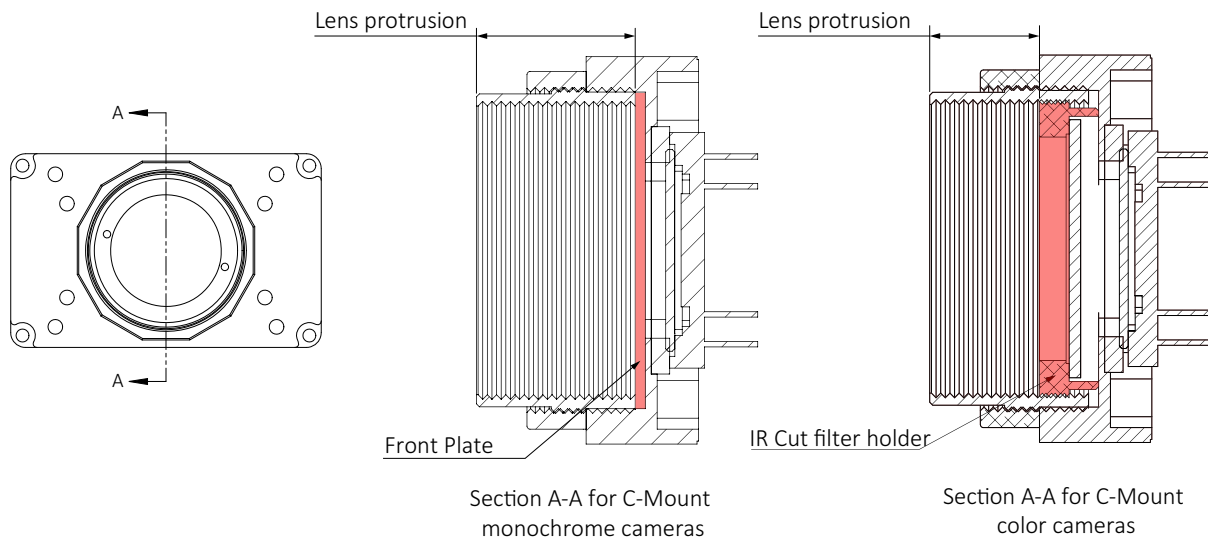


Figure 86: Cross section of typical Prosilica GT camera front assembly with C-Mount



#### NOTICE

Avoid damage from unsuitable lenses. To protect camera and lens, use lenses only up to the allowed maximum protrusion, as listed in the following table.

Model	Lens protrusion [mm]
Prosilica GT1290	13.64
Prosilica GT1290C	9.32
Prosilica GT1380	13.64
Prosilica GT1380C	9.64

Model	Lens protrusion [mm]
Prosilica GT2000C	10.31
Prosilica GT2050	13.64
Prosilica GT2050C	10.31
Prosilica GT2450	13.64

Table 61: Lens protrusion for Prosilica GT models with C-Mount (sheet 1 of 2)

Model	Lens protrusion [mm]
Prosilica GT1600	13.64
Prosilica GT1600C	9.32
Prosilica GT1920	13.64
Prosilica GT1920C	9.27
Prosilica GT1930	14.52
Prosilica GT1930C	9.44
Prosilica GT2000	13.64

Model	Lens protrusion [mm]
Prosilica GT2450C	9.27
Prosilica GT2460	14.404
Prosilica GT2460C	9.324
Prosilica GT2750	13.64
Prosilica GT2750C	9.27
Prosilica GT3400	13.64
Prosilica GT3400C	9.27

Table 61: Lens protrusion for Prosilica GT models with C-Mount (sheet 2 of 2)

## Large Format cameras

Lens protrusion is the distance from outer edge of mount ring to contact point of first surface internal to mount ring. For color cameras, this surface is the IR cut or IR pass filter holder. For monochrome cameras, this surface is the internal camera front plate.

### C-Mount

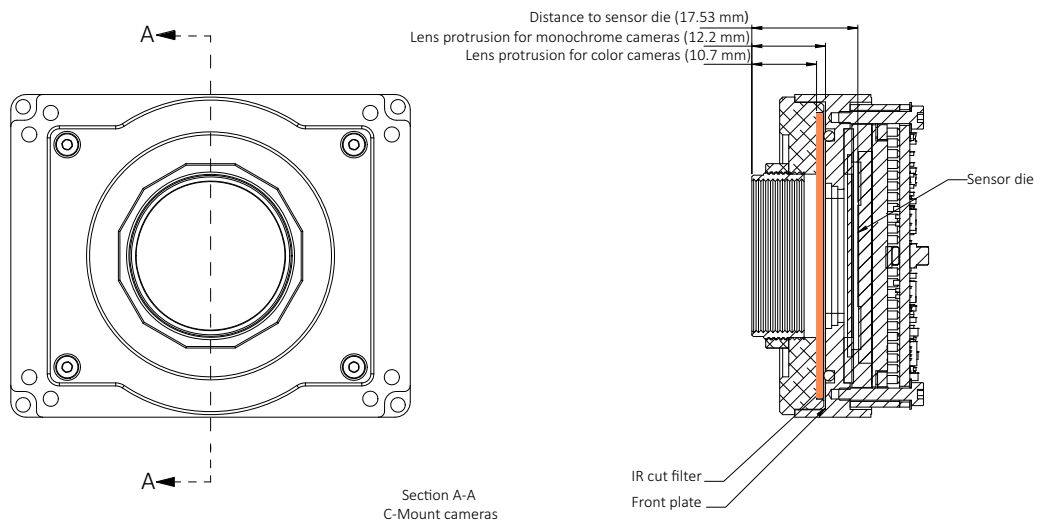


Figure 87: Cross section of Prosilica GT Large Format camera front assembly with C-Mount

## TFL-Mount

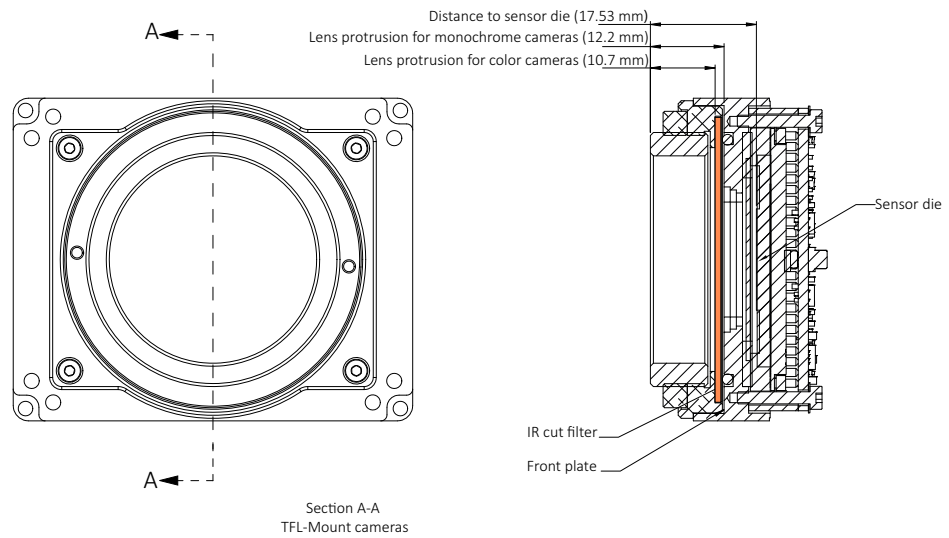


Figure 88: Cross section of Prosilica GT Large Format camera front assembly with TFL-Mount

## M58-Mount

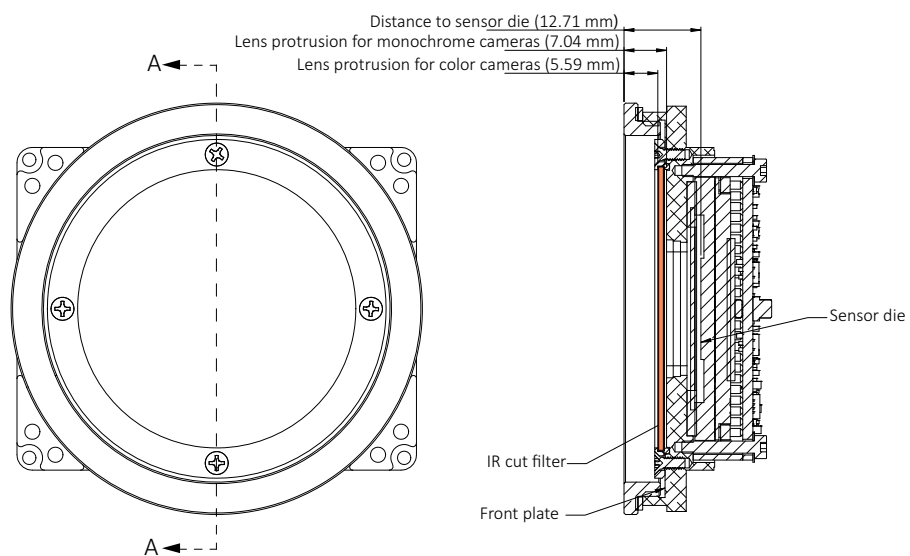


Figure 89: Cross section of Prosilica GT Large Format camera front assembly with M58-Mount


**NOTICE**

Avoid damage from unsuitable lenses. To protect camera and lens, use lenses only up to the allowed maximum protrusion, as listed in the following table.

## Flange focal distance

### Standard and extended cameras

#### C-Mount

Flange focal distance is the optical distance from the mounting flange to image sensor die. Prosilica GT standard and extended format cameras with C-Mount are calibrated to a standard 17.526 mm flange focal distance, with a  $\pm 10 \mu\text{m}$  tolerance.



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  $\pm 10 \mu\text{m}$  tolerance. For more information, see the Modular Concept.

#### Adjustment of C-Mount

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

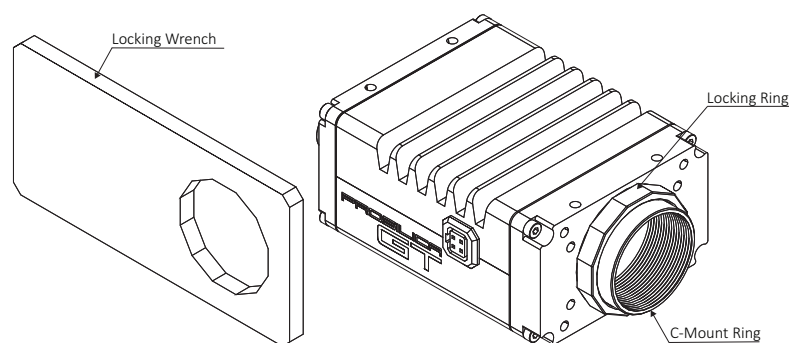


Figure 90: Prosilica GT camera and locking wrench

### Loosen the 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.



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

### Adjusting the lens to infinity

Precondition: Use a C-Mount compatible lens that allows an infinity focus.

1. Set the lens to infinity and image a distant object (10 to 15 meters). Make sure the lens is firmly threaded onto the C-Mount ring.
2. Rotate the lens and C-Mount ring until the image is focused.
3. Carefully tighten the locking ring and recheck focus.

## Large Format cameras

### 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 does not require adjusting. If for some reason the lens mount requires adjustment, use the following method.

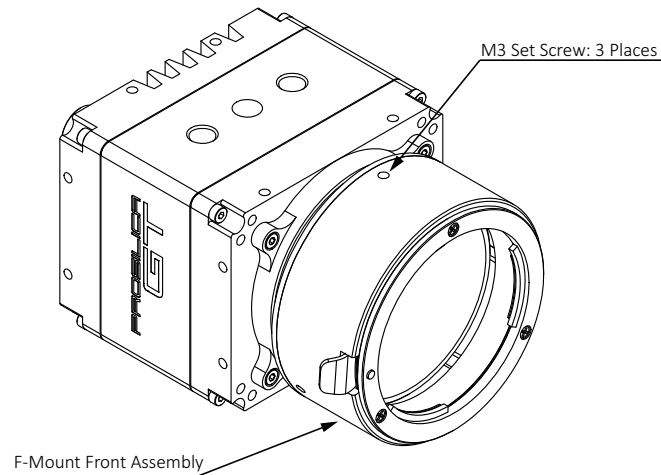


Figure 91: Prosilica GT Large Format with F-Mount isometric view

## 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 snaps into place and the lens flange and camera flange mates over the full circumference.
2. Loosen F-Mount front assembly  
Use a 1.5 mm hex ball driver to loosen the three set screws then hold the F-Mount front assembly to the camera housing.
3. Image to infinity  
Set the lens to infinity and image a distant object (10 to 15 meters). Gently move the F-Mount front until focused and lock it in place.



### C-Mount

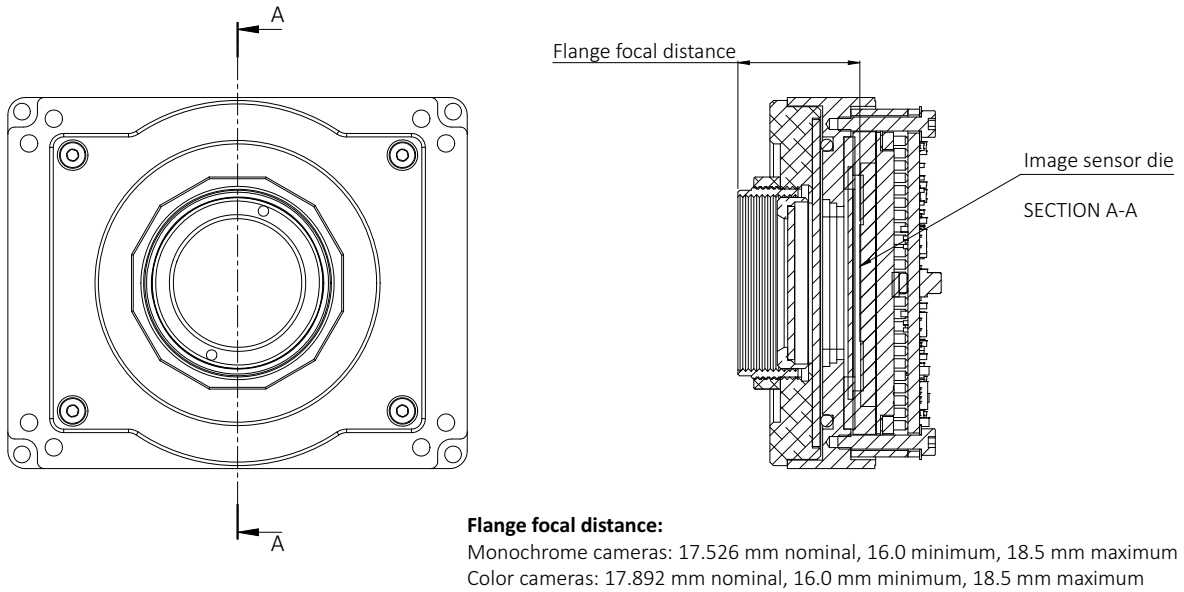


Figure 92: C-Mount (Large Format models) flange focal distance

### M42-Mount PA

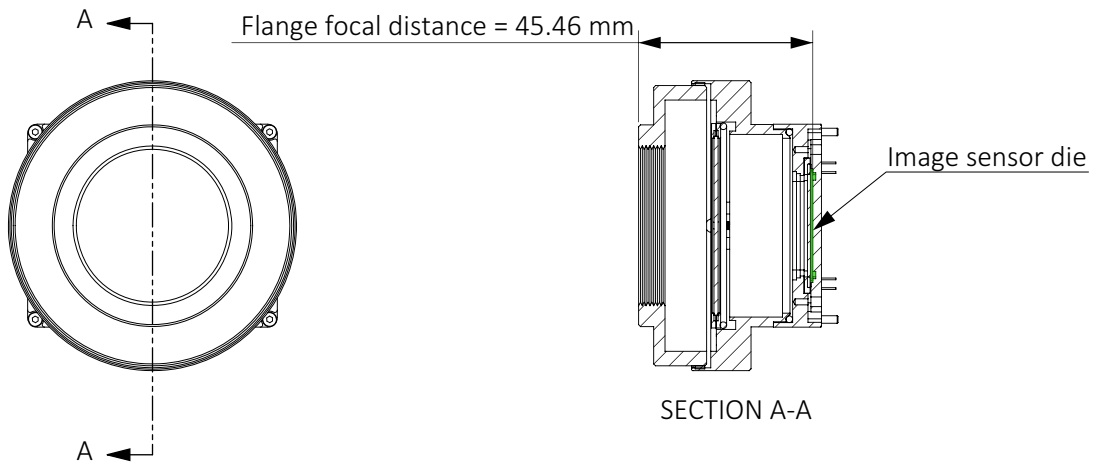


Figure 93: M42-Mount PA flange focal distance

## M42-Mount

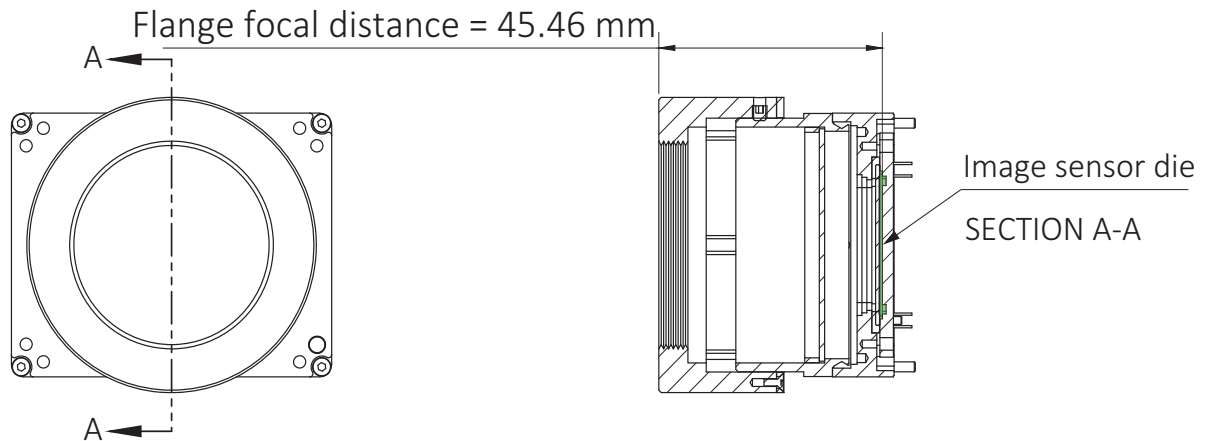
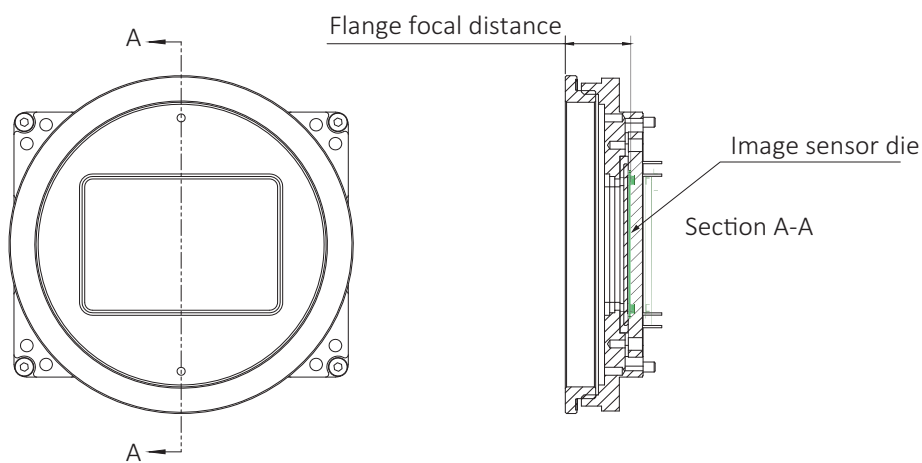


Figure 94: M42-Mount flange focal distance

## M58-Mount



**Flange focal distance:**

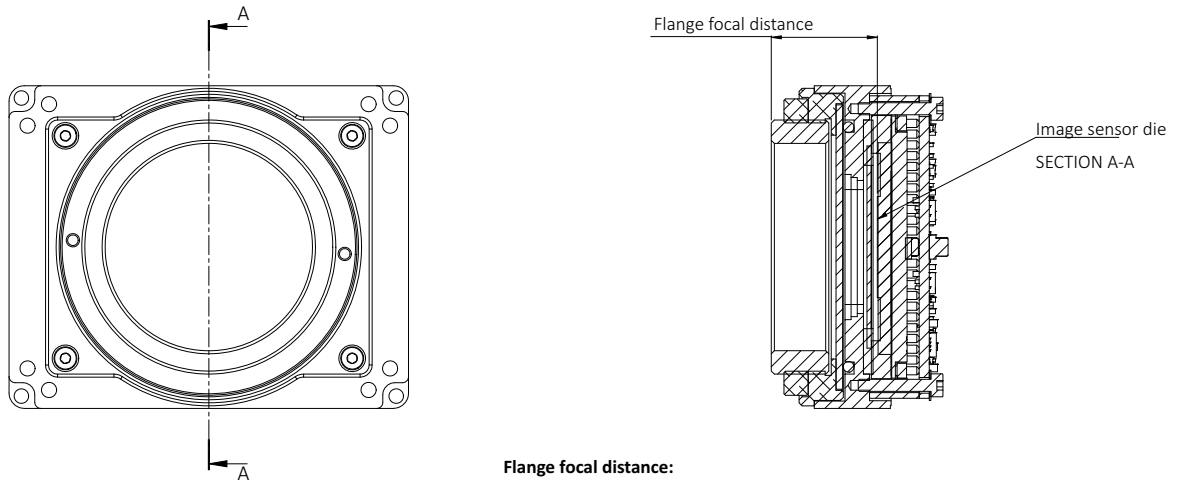
Monochrome cameras: [12.33 to 15.81 mm] adjustable, 12.71 mm nominal.  
 Color cameras: [11.54 to 15.81 mm] adjustable, 12.71 mm nominal.

Figure 95: M58-Mount flange focal distance



The M58-Mount PA flange focal distance is 46.50 mm.

### TFL-Mount



**Flange focal distance:**

Monochrome cameras: 17.526 mm nominal, 17.126 mm minimum, 18.526 mm maximum  
 Color cameras: 17.892 mm nominal, 17.126 mm minimum, 18.526 mm maximum

Figure 96: TFL-Mount flange focal distance

## Calibration variation

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

Mount	Calibration variation	Flange focal distance
C-Mount	Not available	See Figure 92
EF-Mount	< 70 $\mu\text{m}$ (0.3 degrees) Z-tilt and $\pm 10 \mu\text{m}$	44.00 mm
F-Mount	Not available	46.50 mm
M42-Mount	Not available	45.46 mm
M58-Mount	Not available	See Figure 95
TFL Mount	Not available	See Figure 96

Table 62: Calibration variation from standard flange focal distance

## PA 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.



### NOTICE

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

1. Using a compatible lens, set the lens to infinity and image on a target (10 to 15 meters). Target should highlight focus levels at center image and at the corners of the image. A lens with a long focal length, or adjustable zoom lens, allows 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 screws. Adjust the three tilt adjustment screws, as indicated in the following figure, until all targets are in focus.

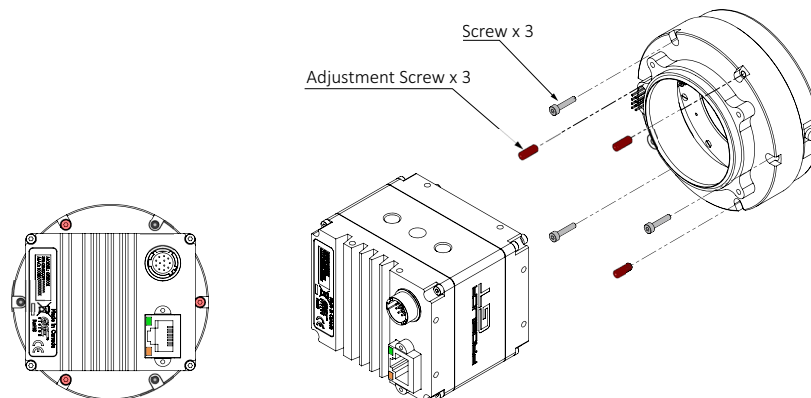


Figure 97: Back view (left) and exploded view (right) of Prosilica GT1930L camera assembly showing the adjustment screws and screws in the EF-Mount

3. Tighten the three screws and recheck the focus.

## Sensor position accuracy

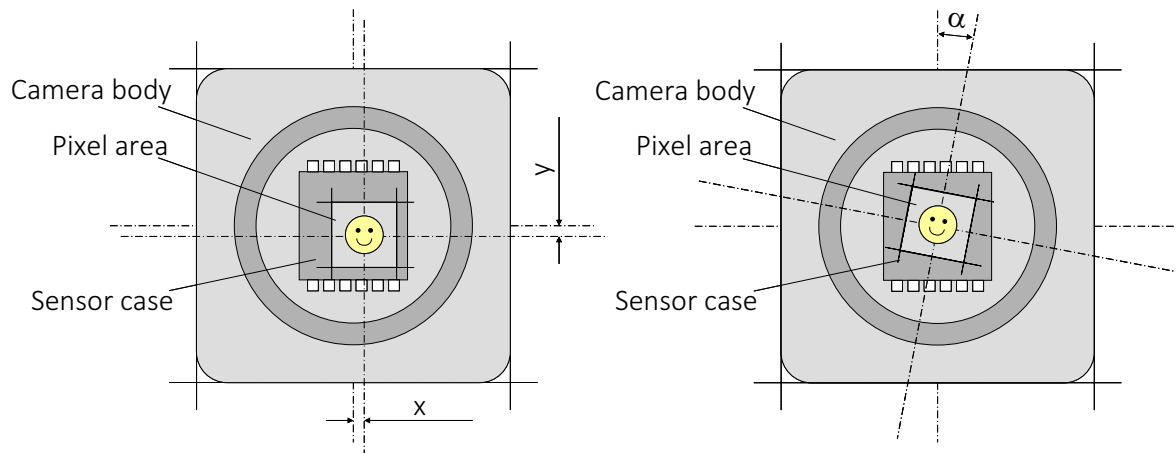


Figure 98: Sensor position accuracy

The following table defines the manufacturing accuracy of fitting sensors into Prosilica GT cameras. Unless stated otherwise, the following values are applicable.

Criteria	Subject	Properties
Alignment method		Optical alignment of photo sensitive sensor area into camera front module (lens mount front flange).
Reference points	Sensor	Center of pixel area (photo sensitive cells)
	Camera	Center of camera front flange (outer case edges)
Accuracy	x-axis y-axis	±250 µm (sensor shift)
	z-axis	±10 µm (optical back focal length)
	$\alpha$	< 1 degrees (sensor rotation as the deviation from the parallel to the camera bottom)

Table 63: Sensor position accuracy criteria

# Optical filters

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

The following figure shows the filter transmission response available optical filters. The Schneider 486 IR cut filter is only available with Prosilica GT Large Format cameras. The RG830 and RG715 type IR pass filters are only available with Prosilica GT standard and extended format cameras.

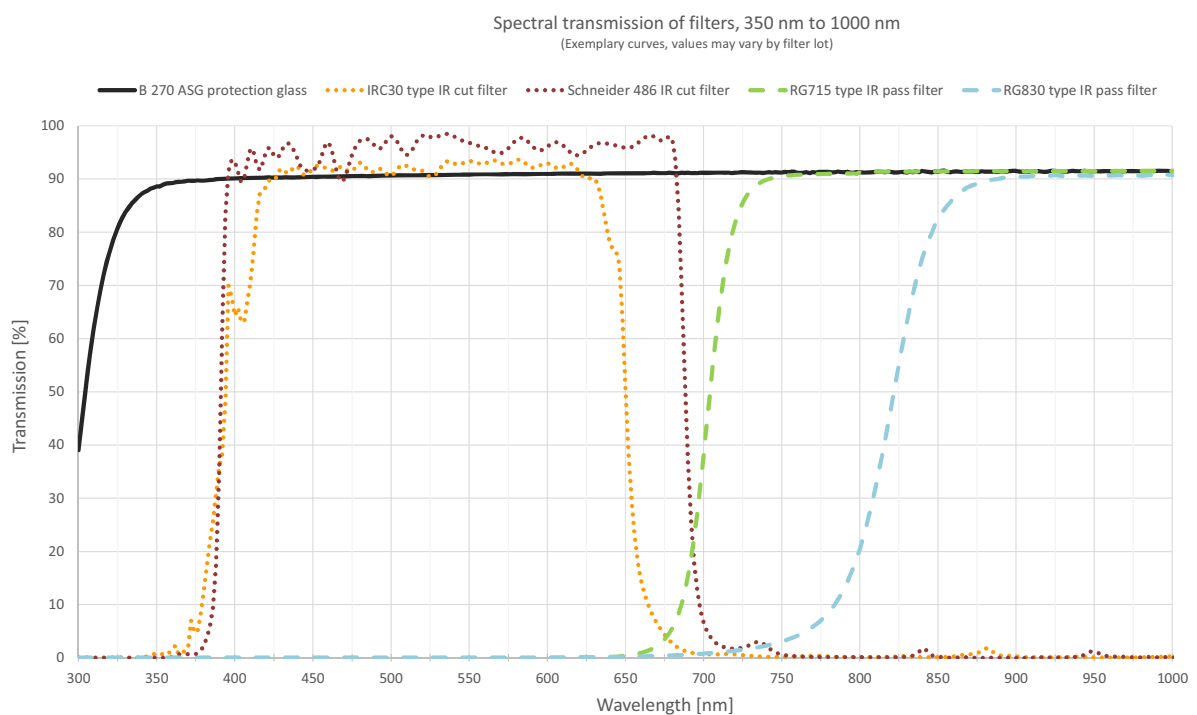
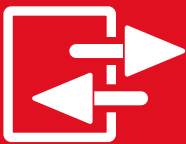


Figure 99: Spectral transmission of filters

# 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 including timing diagram and definitions

## Back panel

### Standard and extended format housing

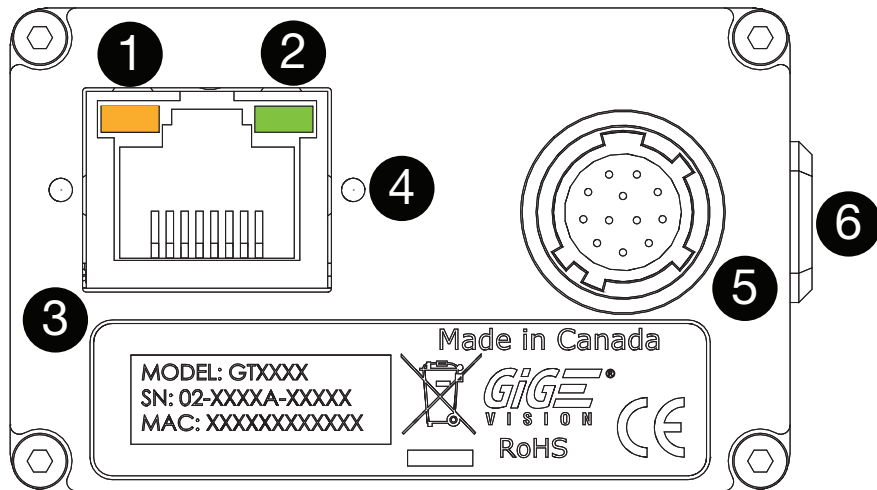


Figure 100: Ports and LEDs (standard and extended housing)

<b>1</b>	LED 1
<b>2</b>	LED 2
<b>3</b>	Gigabit Ethernet port
<b>4</b>	Gigabit Ethernet cable mounting threads
<b>5</b>	Hirose I/O port
<b>6</b>	Auto iris port Large Format cameras do not have an auto iris port.

Table 64: Ports and LEDs



## Large Format housing

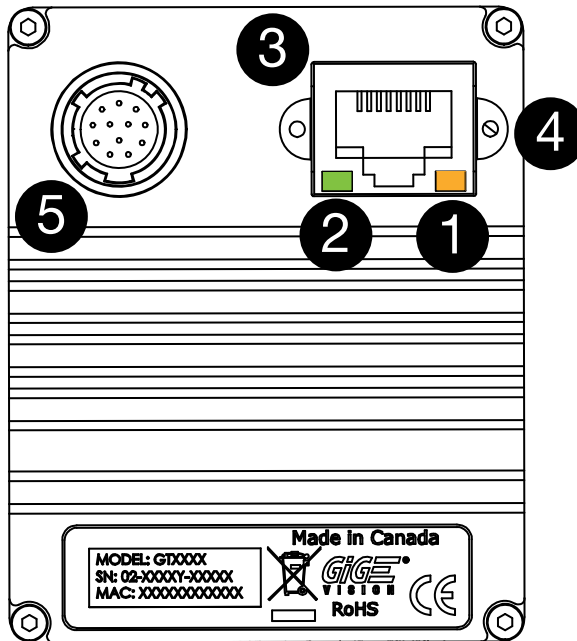


Figure 101: Port and LEDs (Large Format housing)

1	LED 1
2	LED 2
3	Gigabit Ethernet port
4	Gigabit Ethernet cable mounting threads
5	Hirose I/O port

Table 65: Ports and LEDs

## Status LEDs

The color of the LEDs has the following meaning.

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

*Table 66: Status of LEDs*



After the camera is powered on, **LED2** remains solid green as long as the camera is powered, even when connection with the host is lost.

## Gigabit Ethernet port

Prosilica GT is powered through the 12-pin Hirose I/O port, or the Gigabit Ethernet port by using any standard PoE supported NIC, switch, or injector. We recommend using CAT6 or higher compatible cabling for best performance.

Cable lengths up to 100 meters are supported. The 8-pin RJ45 jack has the pin assignment according to the IEEE 802.3 1000BASE-T Ethernet standard.

Prosilica GT cameras support cables with horizontal locking screw connector for a secured connection.

We recommend using locking-screw cables from Components Express, Inc. for a perfect fit. Go to [CEI product configurator](#) to customize the cable according to your needs.



See the Hardware Selection for Allied Vision GigE Cameras application note for a list of recommended GigE host controller cards, see [www.alliedvision.com/en/support/technical-papers-knowledge-base](http://www.alliedvision.com/en/support/technical-papers-knowledge-base).



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).

Contact the Allied Vision Sales team for additional GigE host controllers.

# Camera I/O connections

The GPIO port uses a Hirose HR10-10R-12PA(73) connector on the camera side. The mating cable connector is Hirose HR10A-10P-12S.



### Safety-related instructions to avoid malfunctions

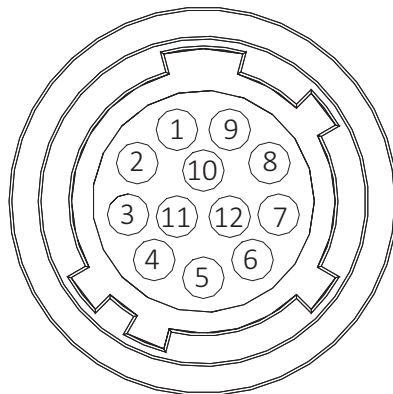
Read all Notes and Cautions in the Hardware and Installation chapter before using the Hirose I/O connector.



### Hirose connector

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

## I/O connector pin assignment



Camera side Hirose HR10A-10R-12PB connector					I/O cable color code
Pin	Signal	Direction	Level	Description	
1	Camera GND	In	GND for RS232 and external power	Ground for camera power supply and RS232	Blue
2	Camera Power	In	7 to 25 VDC	Camera power supply	Red
3	Out 4	Out	Open emitter Nominal 5 mA; Maximum 8 mA	Opto-isolated Output 4 (SyncOut4)	Pink
4	In 1	In	LVTTTL maximum 3.3 V	Non-isolated Input 1 (SyncIn1)	Gray

Table 67: Camera I/O connector pin assignment and color coding (sheet 1 of 2)

Camera side Hirose HR10A-10R-12PB connector						I/O cable color code
Pin	Signal	Direction	Level	Description		
5	Out 3	Out	Open emitter Nominal 5 mA; Maximum 8 mA	Opto-isolated Output 3 (SyncOut3)	Yellow	
6	Out 1	Out	3.3 V LVTTTL maximum 50 $\mu$ A	Non-isolated Output 1 (SyncOut1)	Green	
7	Isolated IN GND	In	Common GND for Input	Isolated input signal ground	Brown	
8	RxD RS232	In	RS232	Terminal receive data	White	
9	TxD RS232	Out	RS232	Terminal transmit data	Black	
10	Isolated Out Power	In	Common VCC for outputs 5 to 24 VDC	Power input for opto-isolated outputs	Orange	
11	In 2	In	$U_{in}(\text{high}) = 5 \text{ to } 24 \text{ V}$ $U_{in}(\text{low}) = 0 \text{ to } 0.8 \text{ V}$	Input 2 opto-isolated (SyncIn2)	White/ Black	
12	Out 2	Out	3.3 V LVTTTL maximum 50 $\mu$ A	Non-isolated Output 2 (SyncOut2)	White/Brown	

Table 67: Camera I/O connector pin assignment and color coding (sheet 2 of 2)



For cable color and pin out information, see the Allied Vision I/O cable data sheet, at:

[www.alliedvision.com/en/support/technical-documentation/accessories-data-sheets](http://www.alliedvision.com/en/support/technical-documentation/accessories-data-sheets).

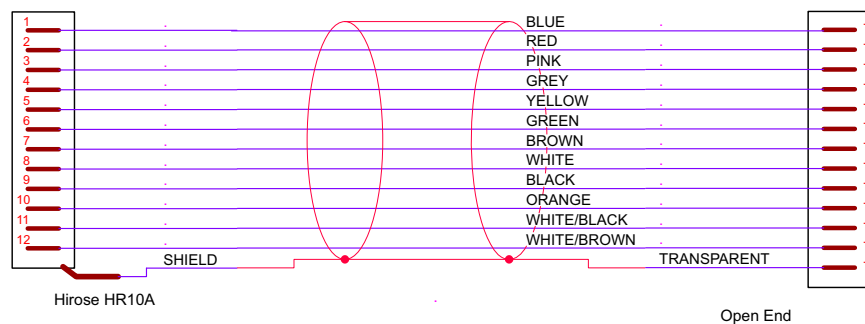


Figure 102: Cable color coding

# I/O definition

## Camera power

The 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 port when using a PoE supported NIC, switch, or injector.

Cameras powered by both the Hirose I/O port and the Gigabit Ethernet port 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 VDC will damage the camera.



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

- Order code: 13869 (Desktop power supply without connection cable)
- Order code: 13866 (AC power cable, 1.8 m, US to C13)
- Order code: 13865 (AC power cable, 1.8 m, EU to C13)

## RxD RS232 and Tx D 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.



For complete RS232 description and usage, see the RS232 Port application note at [www.alliedvision.com/en/support/technical-papers-knowledge-base](http://www.alliedvision.com/en/support/technical-papers-knowledge-base)

## 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 volts. Tie trigger ground to Camera GND to complete the trigger circuit.



### NOTICE

#### Power caution

Exceeding 5.1 volts on **In 1** can permanently damage the camera.

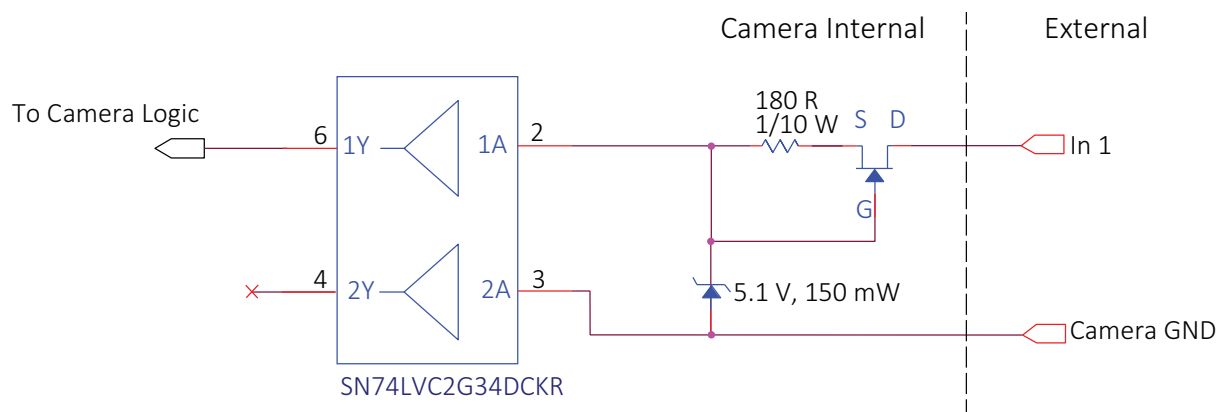


Figure 103: Internal circuit diagram for non-isolated input trigger

## 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 IO 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 volts with a minimum current source of 5 mA.

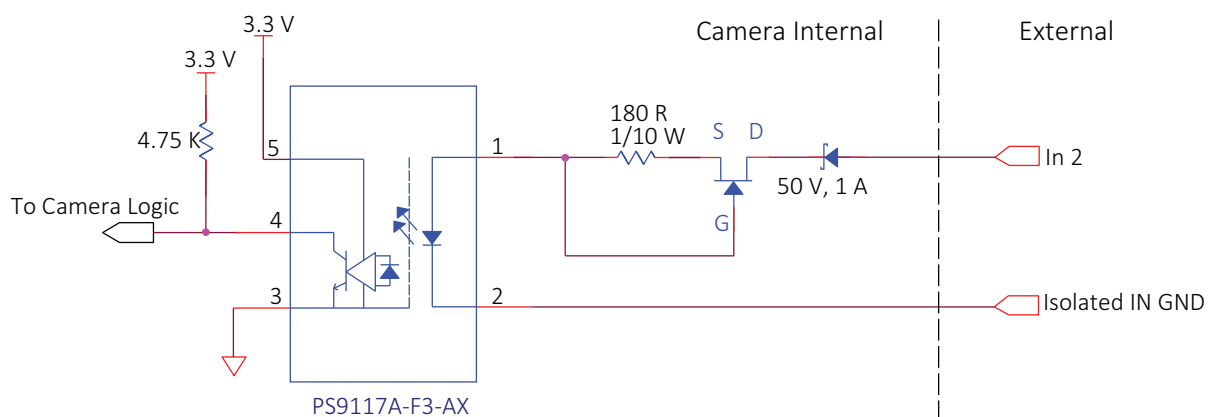


Figure 104: Internal circuit diagram for opto-isolated input trigger

## 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:

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

Table 68: Output signals

## 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** or **Out 4** wiring to prevent parasitic coupling.



## Out1 and Out2 (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 volts. It is not suitable for driving loads in excess of 50  $\mu$ A.

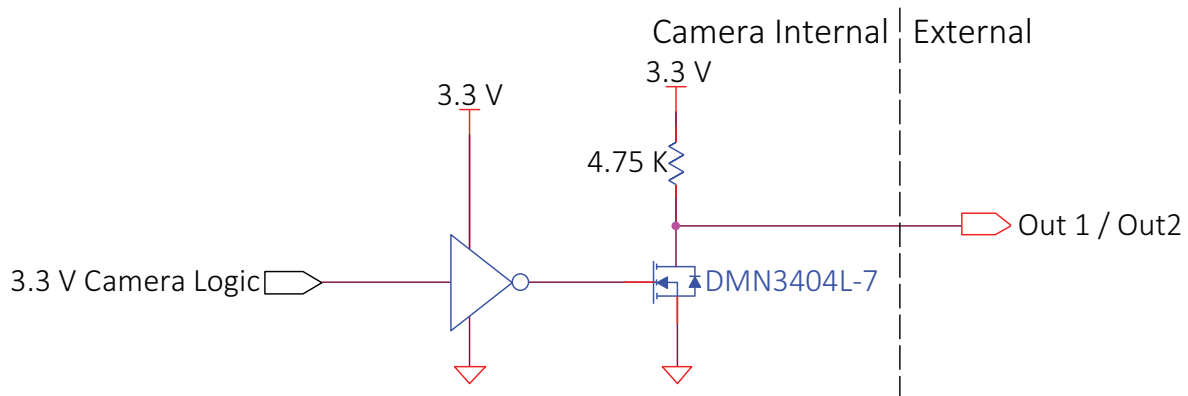


Figure 105: Out 1 and Out 2 trigger circuit

## Out3 and Out4 (Opto-isolated)



### Note on 4.75 K $\Omega$ resistors

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

Regardless of whether your Prosilica GT camera has the two 4.75 K $\Omega$  internal pull-down resistors or not, implement the output trigger (Out3 and Out4) as described later.

**Out 3** and **Out 4** signals are optically isolated and require the user to provide a voltage level, Isolated Out Power. The **Out3** and **Out4** signal should be grounded by adding an external load resistor as shown in the following figure and table. Isolated Out Power can be configured between 5 to 24 volts.

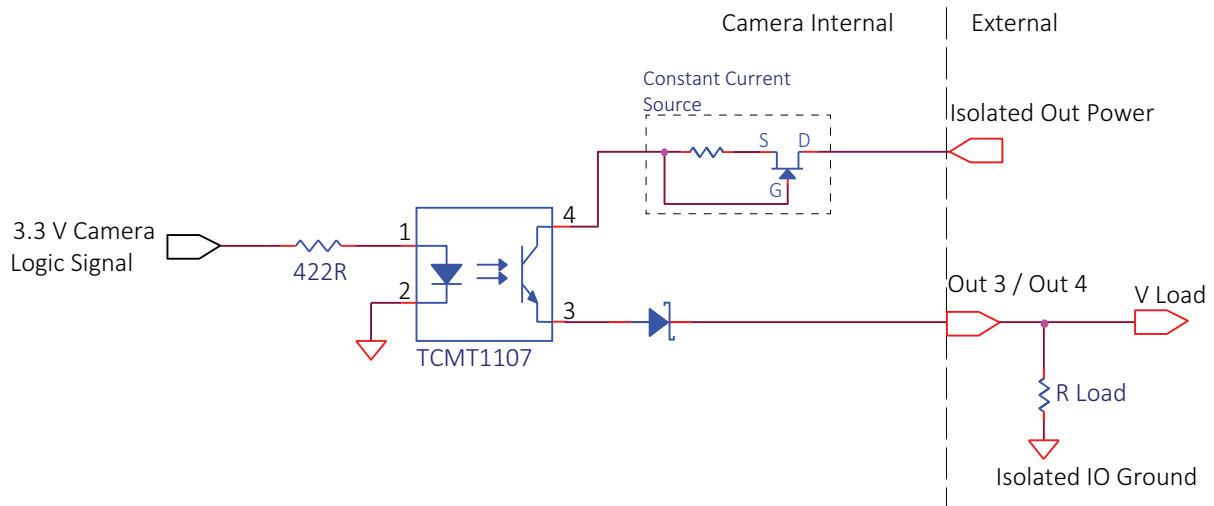


Figure 106: Out 3 and Out 4 trigger circuit

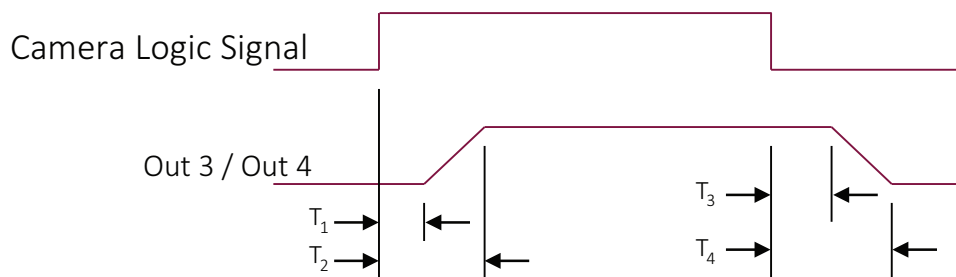


Figure 107: Out3 and Out4 timing diagram

The influence of various Isolated Out Power values and load values on the timing response of the trigger is indicated in the following table. 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 <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
5 V	8 mA	500 Ω	4.2 V	35 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 69: Trigger circuit values

## Lens control

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

Both DC-Iris 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.



- 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-type auto iris or P-Iris lens

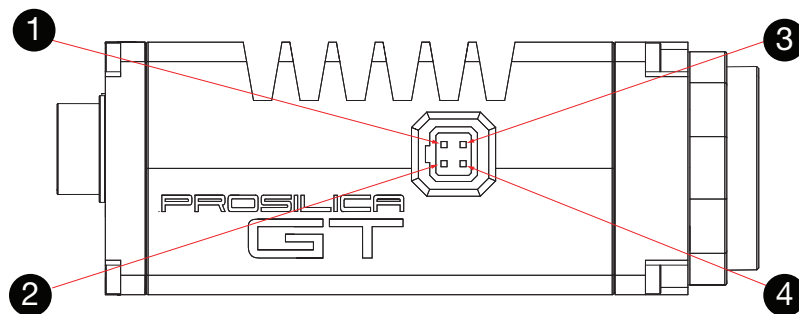


Figure 108: Lens control port

DC-Iris mode			
PIN number	PIN function	Voltage	Maximum current
1	D amp – (input)	Not applicable	Not applicable
2	D amp + (input)	Not applicable	Not applicable
3	Drive + (output)	3.3 V	50 mA
4	Drive – (output)	0 to 3.3 V	50 mA

Table 70: DC-Iris mode lens control pin assignment

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 71: P-Iris mode lens control pin assignment

## DC-Iris lenses

The Prosilica GT cameras with standard and extended housings operate with any standard DC-type auto iris lens. We 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 volts) 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.

## Operating DC-Iris lenses

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

## Operate DC-Iris lenses

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**.

## 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.

## Operating P-Iris lenses

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

### Operate P-Iris lenses

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, 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**.



For a list of P-Iris supported lenses, along with their **LensPIrisFrequency** and **LensPIrisNumSteps** specifications, see the P-Iris Lens application note at [www.alliedvision.com/en/support/technical-papers-knowledge-base](http://www.alliedvision.com/en/support/technical-papers-knowledge-base)

## EF lens control

EF lens control is available for the Prosilica GT1930L, GT4090, GT4096, GT4400, GT5120, GT5400, and GT6400 series cameras. EF lens control allows focus and aperture control via host software.



### NOTICE

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

If your lens plus camera power requirements exceed 13 watts, power the camera via the Hirose I/O port.

See the Modular Concept for information on lens mount options available with Prosilica GT Large Format cameras.

## Operating EF lenses

EF-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

### Operate EF lenses

1. Connect an EF lens to the camera before powering up the camera.
2. Power up the camera, and open the camera control software.
3. Use `EFLensInitialize` command to initialize the EF lens. This command is automatically executed on power up 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`.

# Camera trigger

## Trigger timing diagram

The following diagram explains the general trigger concept for CCD-sensor models.

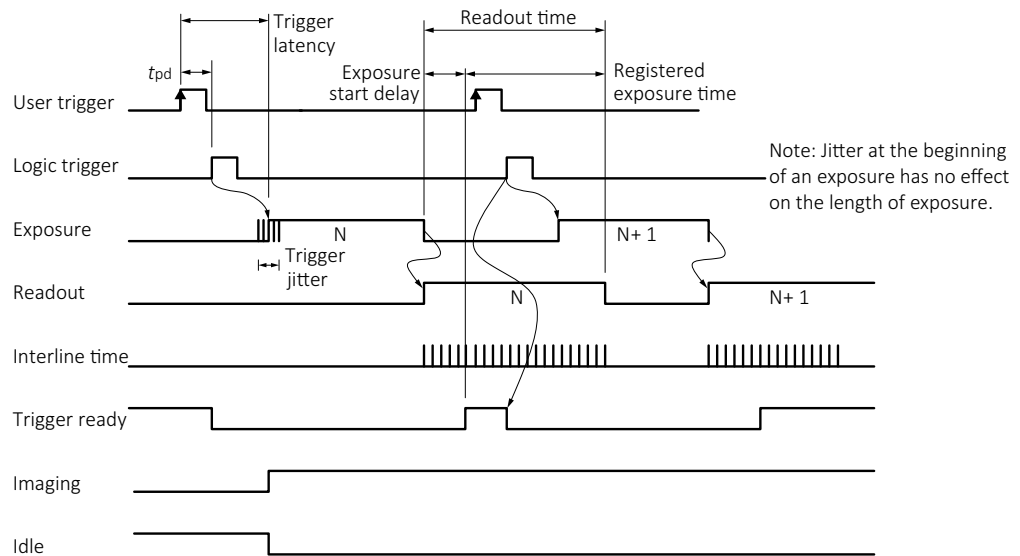


Figure 109: Internal signal timing waveforms (CCD-sensor models)

The following diagram explains the general trigger concept for CMOS-sensor models.

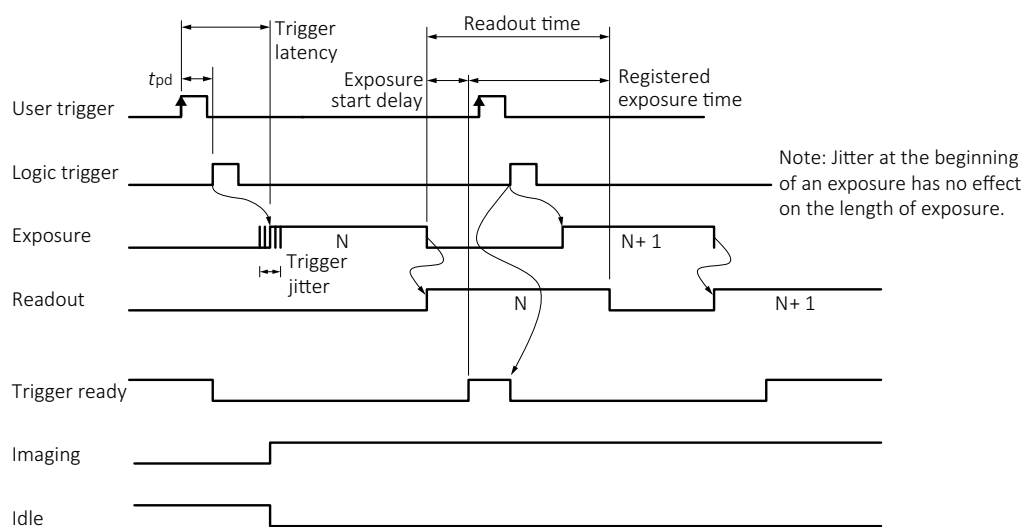


Figure 110: Internal signal timing waveforms (CMOS-sensor models)

## 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).
Propagation delay	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 or reading out data.
Idle	High if the camera image sensor is not exposing or reading out data.

Table 72: 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 the Specifications chapter.

- 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 the Specifications chapter.



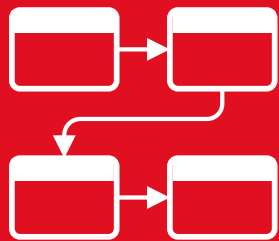
## Triggering during the readout state

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 because 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 at [www.alliedvision.com/en/support/technical-papers-knowledge-base](http://www.alliedvision.com/en/support/technical-papers-knowledge-base)

# Image data flow



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

A complete listing of camera features, including definitions can be found on the Allied Vision Technical Documentation webpage.

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

# Prosilica GT model series with CCD sensors

Model series: Prosilica GT1290, GT1380, GT1600, GT1920, GT2450, GT2750, GT3400

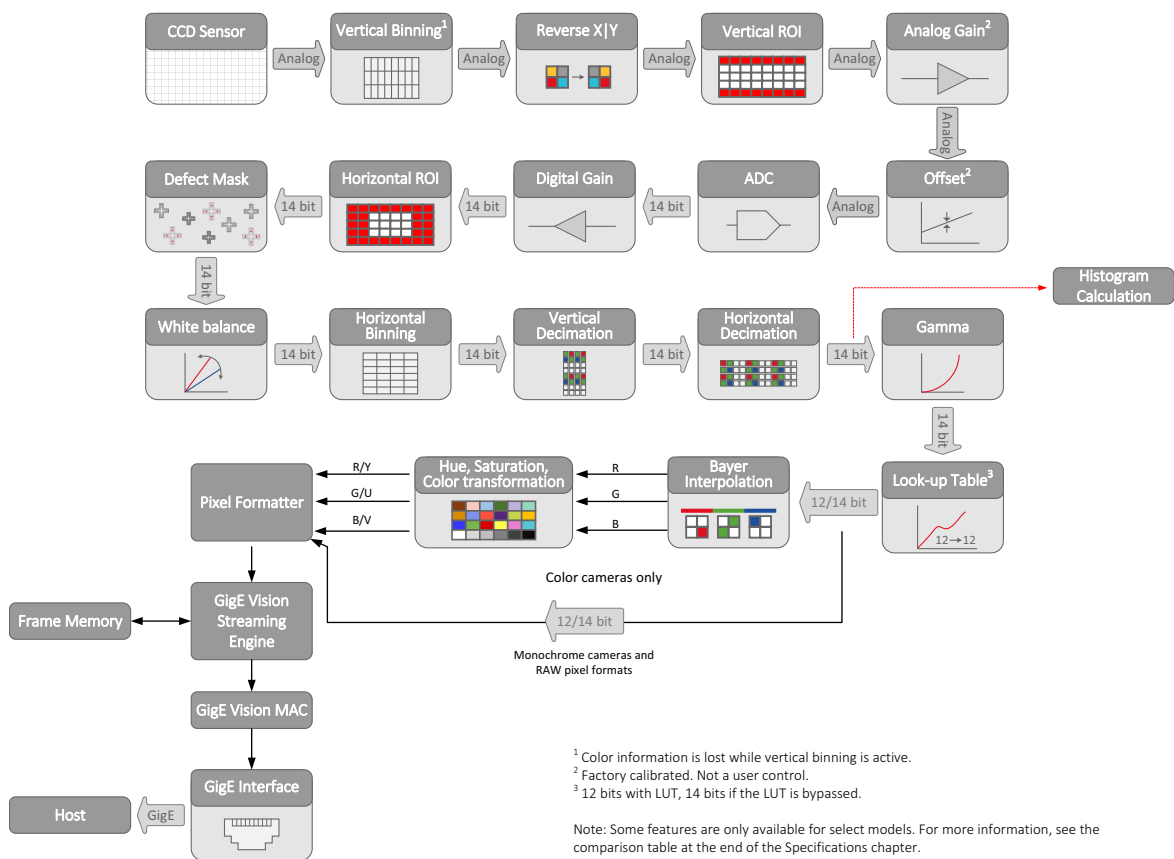


Figure 111: Image data flow for model series with CCD sensors

# Prosilica GT model series with CMOS sensors

Model series: Prosilica GT1930, GT1930L, GT2460, GT4400, GT5400, GT6400

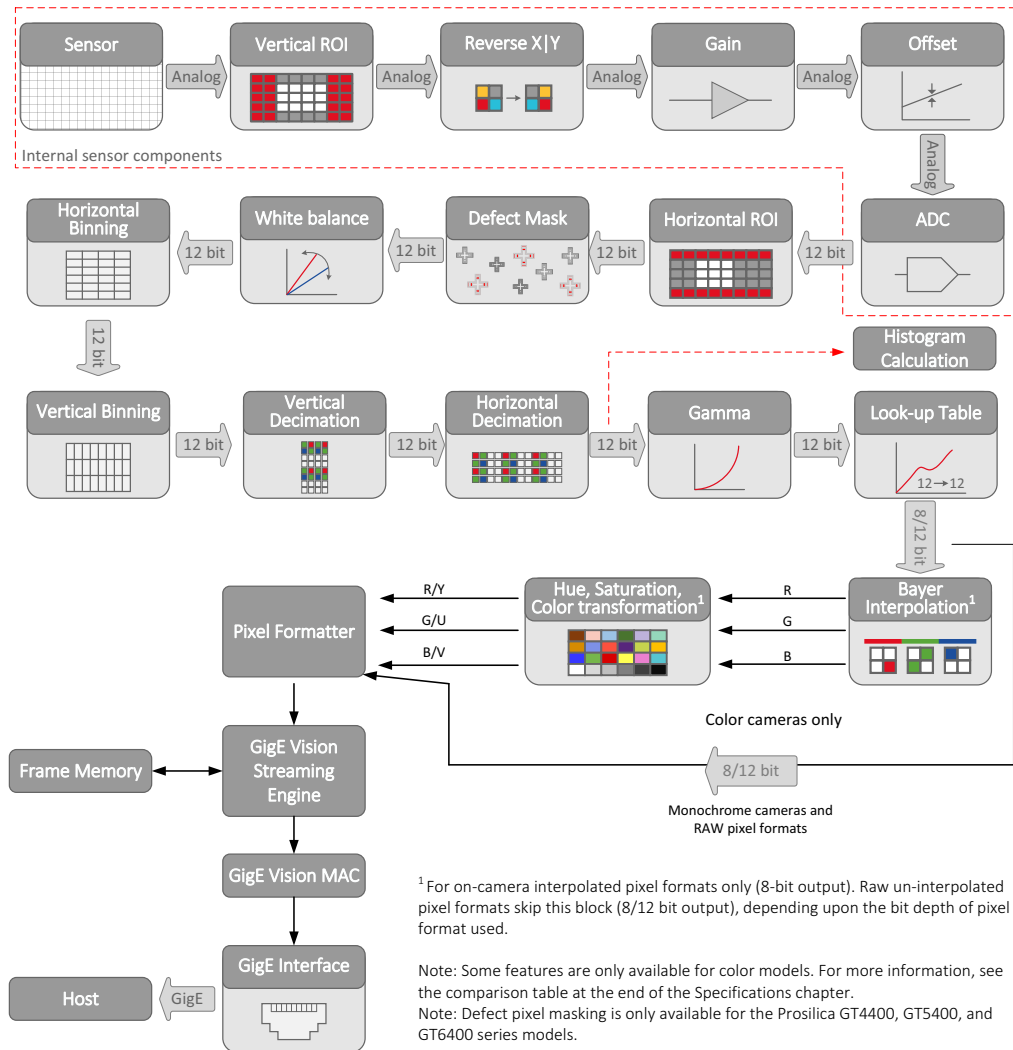


Figure 112: Image data flow for Prosilica GT1930, GT1930L, GT2460, GT4400, GT5400, and GT6400 model series

Model series: Prosilica GT2000, GT2050

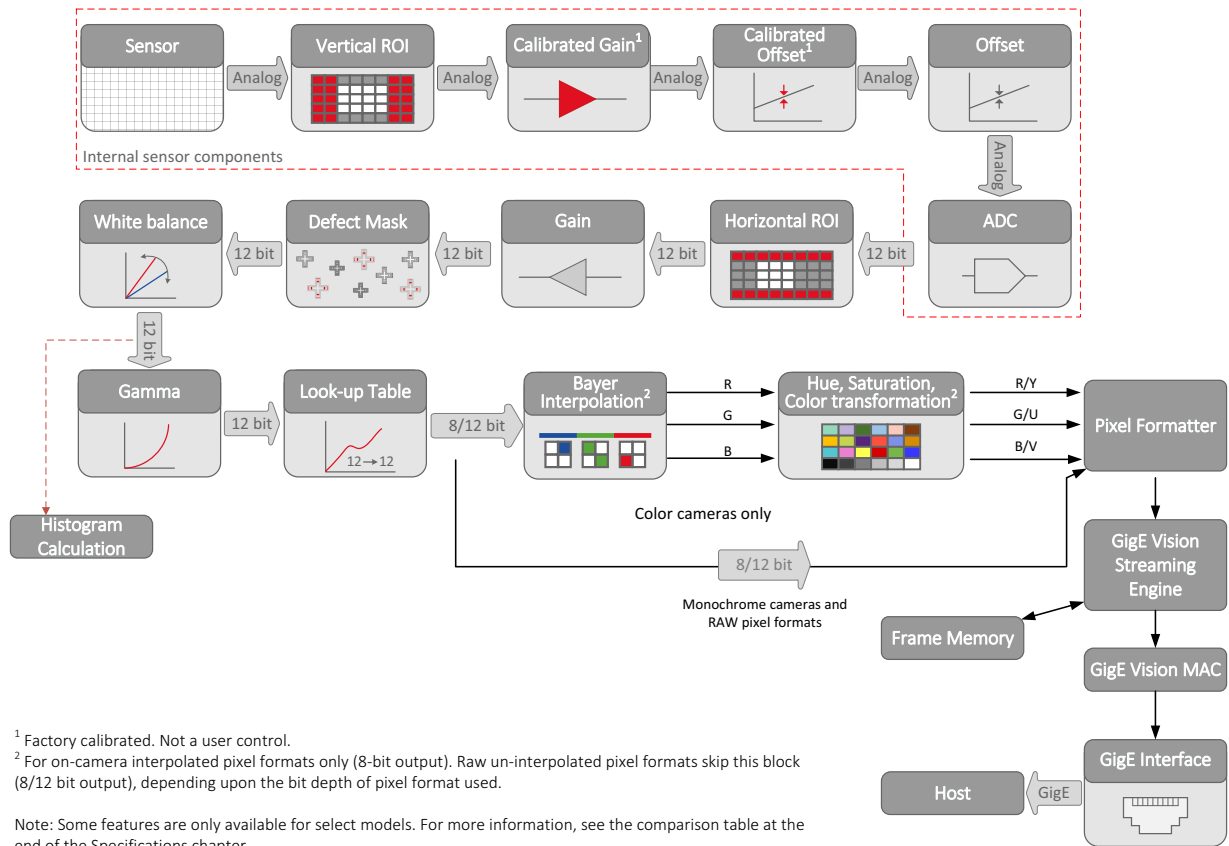


Figure 113: Image data flow for Prosilica GT2000 and GT2050 model series

Model series: Prosilica GT4090, GT4096, GT5120

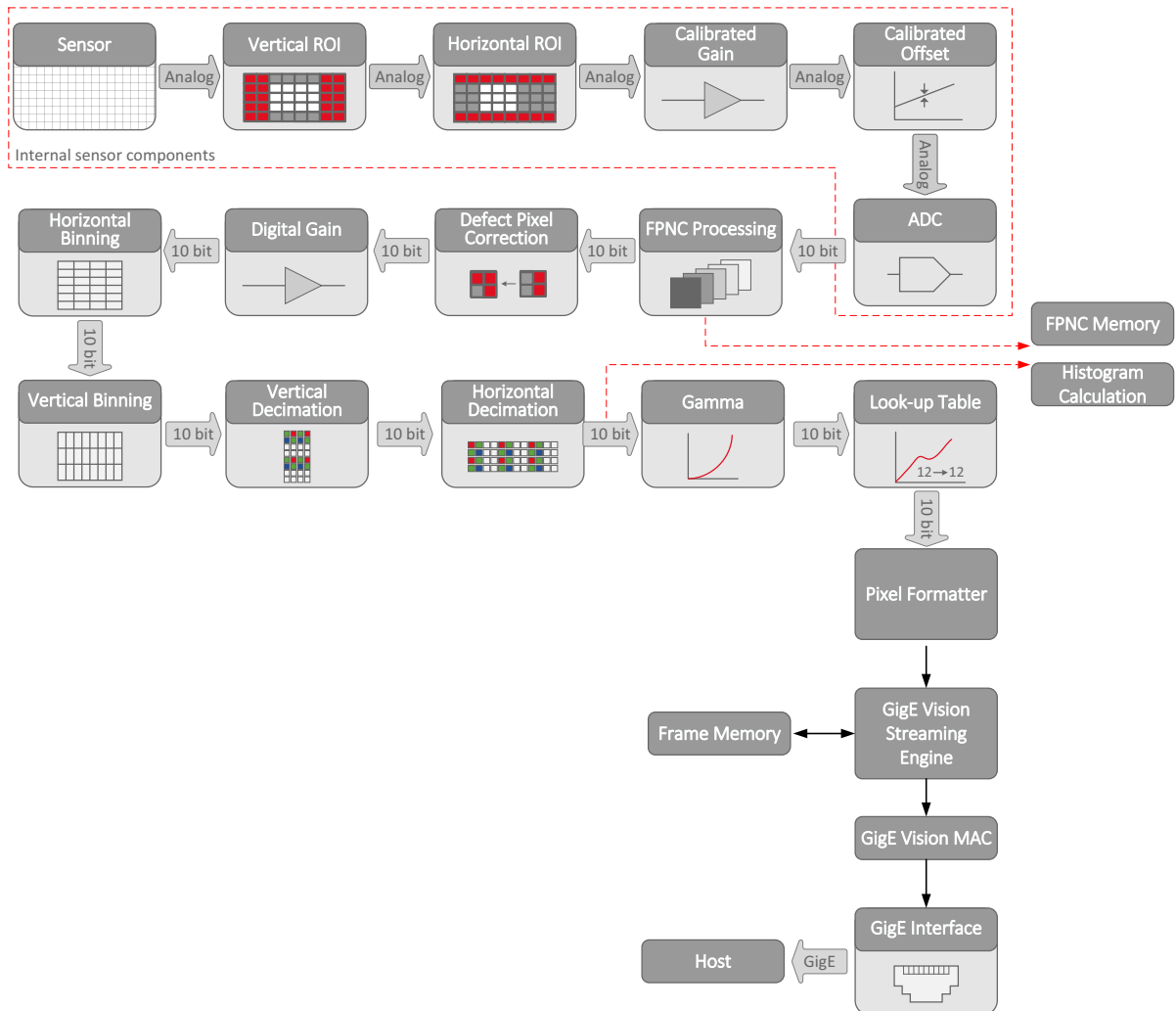
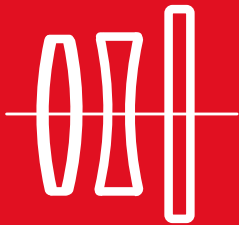


Figure 114: Image data flow for model series with ON Semi PYTHON sensors

# Cleaning optical components



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



Read these instructions before you contact Allied Vision or your Allied Vision distribution partner for assistance.

Contact Allied Vision or your Allied Vision distribution partner if you are not familiar with the procedures as previously described.



#### NOTICE

Some cleaning agents can damage this product. Avoid cleaning the image sensor unless absolutely necessary. See instructions on optics cleaning in this document.

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

## 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 or 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, or 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 the following figure, 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.



Don't 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.

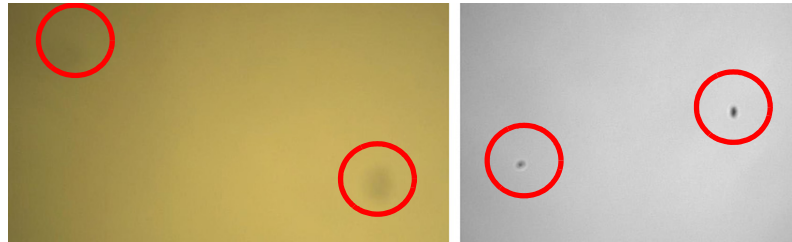


Figure 115: Image with tiny dust on the filter (left) and dust on the sensor (right)

## Locating impurities

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

1. Start acquiring a uniform image (for example, 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 or protection glass window and the impurity moves as well, the impurity is on the filter or protection glass. Carefully remove the filter or 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 or protection glass, it is probably on the sensor.



### NOTICE

A pin spanner wrench (Allied Vision order code: E9020001) suitable for IR filter removal is available for purchase from Allied Vision for all Prosilica GT cameras except Prosilica GT Large Format cameras.

Don't attempt to remove the camera IR filter for Prosilica GT Large Format cameras. Contact [support@alliedvision.com](mailto: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.


**NOTICE**

Never use these cleaning materials for optical components:

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


**Optical cleaning liquid material safety data sheets**

Read the material safety data sheet (MSDS) for the optical cleaning liquid before cleaning your camera and optics. The MSDS provides important information including hazard identification, first aid measures, handling and storage, and PPE.

## Cleaning Instructions


**Workplace conditions:**

- Perform all cleaning operations (lenses, filter or 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.



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, contact your Allied Vision distribution partner.

## Cleaning with compressed air

We do not recommend cleaning Prosilica GT cameras with compressed air.



### NOTICE

- Compressed air at high pressure or shorter operating distances may push dust into the camera or 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 or compressed air only if you are familiar with cleaning a camera using this method.

If you chose 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 100 kPa.
- Operating distance from the camera should be 5 to 30 cm.

# Firmware update



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



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

Before loading new firmware, backup your current camera settings.

- **Vimba Viewer:** select the **Save Camera Settings** icon from the **Cameras** window to export the camera settings file (XML format) to the host computer.
- **GigE SampleViewer:** select the **Disk** icon from the **Cameras** window to export camera settings file (XML format) to the host computer.



### NOTICE

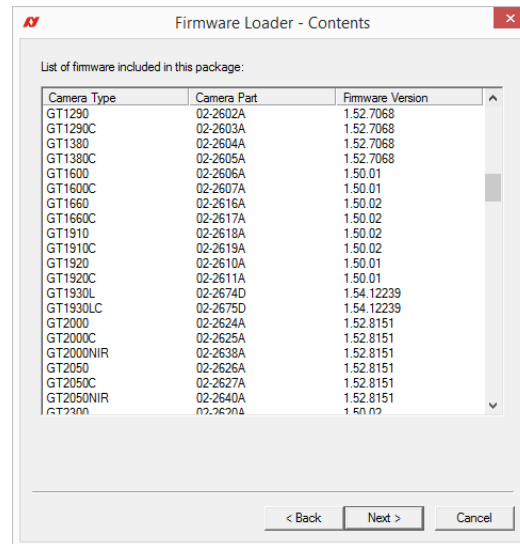
Don't unplug the GigE cable or camera power supply during the update procedure.

## To update the firmware on your Prosilica GT camera

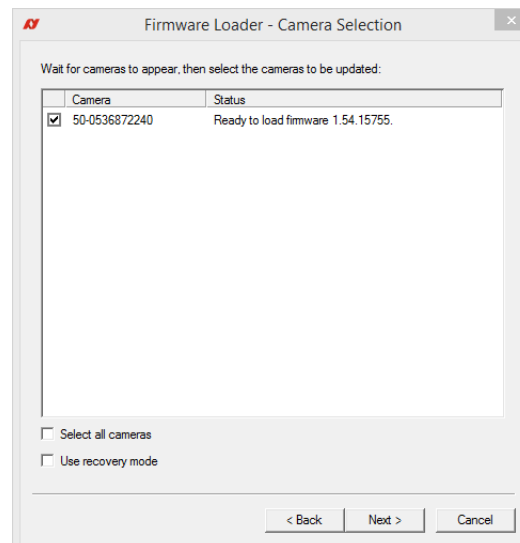
Step 1: Launch the **Firmware Loader**.



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

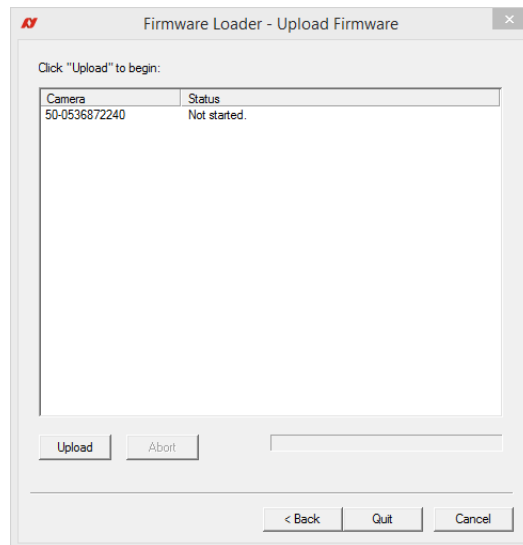


Step 3: Click **Next**. Select your camera model on this page.

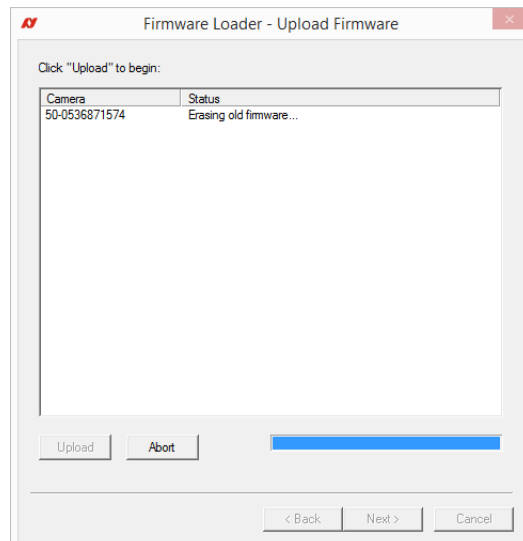


Select the **Use recovery mode** check box if the connected GigE camera is not found by the firmware loader, or if the GigE camera is listed as unavailable. When selected, power cycle the camera to enter the **Boot Loader** mode.

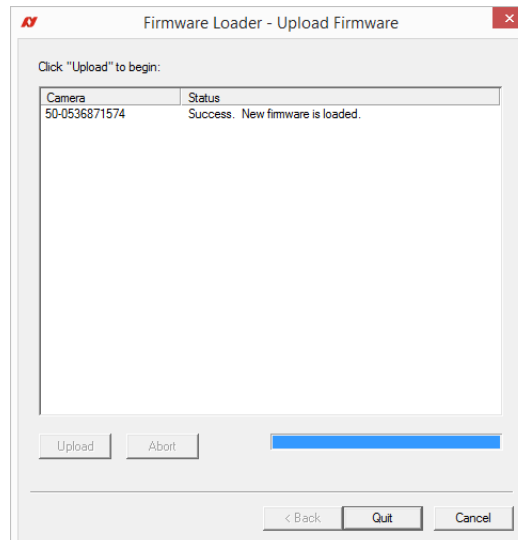
Step 4: Click **Next**.



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



Step 6: The **Firmware Loader** displays a success status upon completion. Click **Quit** to exit the loader.



You must always power cycle the camera after a firmware upgrade or downgrade.



# Index

## A

adjustment	
C-Mount .....	166
F-Mount .....	168

## C

camera GND .....	182, 183, 185
camera power.....	180, 182
Category 6 .....	48
cleaning	
compressed air.....	203
instructions .....	202
locating impurities .....	201
materials .....	201

## D

DC-Iris lens.....	187, 188
Document history .....	23

## E

electrostatic discharge.....	31
Environmental specifications.....	39, 49
ESD.....	31, 39

## F

firmware	
recovery mode .....	206
update.....	205
flange focal distance	
C-Mount .....	166
F-Mount .....	167
Frame memory .....	55
Frame rate .....	56
CCD sensors .....	56

## G

GenICam .....	54
Gigabit Ethernet interface .....	179
GigE	
host controller.....	179
GigE Vision .....	54
GND	
camera .....	180
RS232 and external power .....	180

## H

heat dissipation.....	37
-----------------------	----

## I

In 1 .....	180, 183
In 2 .....	181, 183, 184
interline boundary .....	193
IR filter .....	174
Isolated In GND.....	181, 183, 184
Isolated Out Power .....	181, 184, 186

## L

Lens control .....	187
lens protrusion.....	163
lenses	
maximum protrusion.....	40

## M

Manual conventions	
Styles .....	30
Symbols .....	30

## O

Out 1 .....	181, 185
Out 2 .....	181, 185

Out 3 ..... 181, 184, 185  
 Out 4 ..... 180, 184, 185, 186

## P

P-Iris lens .....187, 188  
 Power  
   DC.....49

## R

Resolution and ROI frame rates  
   Prosilica GT model comparison.....134  
 ROI measurements .....56  
 RS232.....181, 182

## S

safety ..... 2, 4, 13, 30, 37  
   camera power .....39  
   electrical connections .....39  
   heat dissipation.....37  
   lens mounts.....37  
   maximum protrusion .....40  
   optical components .....40  
   sensor.....40  
 sensor handling .....40  
 sensor position accuracy .....173  
 signal  
   exposing .....192  
   exposure cycle.....192

  exposure start delay..... 192  
   idle..... 192  
   imaging..... 192  
   integrating light ..... 184  
   interline time..... 192  
   registered exposure time ..... 192  
   sensor row readout cycles..... 192  
 Specifications ..... 53  
 spectral transmission  
   IRC30 filter..... 174  
 status LEDs..... 178  
   LED2 ..... 178

## T

trigger  
   exposure..... 192  
   integrating light ..... 192  
   latency time..... 192  
   logic trigger ..... 192  
   propagation delay ..... 192  
   readout..... 192  
   readout data..... 192  
   rules..... 192  
   time delay..... 192  
   timing diagram ..... 191  
   trigger jitter ..... 192  
   trigger latency ..... 192  
   trigger ready..... 192  
   user trigger ..... 192  
 tripod adapter..... 161