



Technical Manual

Low-noise or cooled CCD camera with GigE interface

V2.0.0

03 November 2011

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Contents

Contacting Allied Vision Technologies	5
Introduction	6
Document history	6
Manual overview	6
Conventions used in this manual	7
Styles	7
Symbols	7
Before operation	8
Safety warnings	8
Conformity	9
CE	9
Specifications	10
Bigeye P-132B	10
Bigeye P-132B/C Cool / Bigeye P-132B Solar Cool	12
Bigeye P-629B Cool / P-629B Solar Cool	14
Bigeye P-1100B/C Cool	16
Spectral sensitivity	18
Camera dimensions	21
Bigeye P-132B	21
Bigeye P-132B/C Cool and P-132B Solar Cool	23
Bigeye P-629B Cool / Solar Cool	25
Bigeye P-1100B/C Cool	27
Camera interfaces	29
Control junction	29
Camera I/O connector pin assignment (15-pin D-Sub jack)	29
Power supply (Pin 1-4)	31
Mode input (Pin 9)	32
Trigger input (Pin 10, 11)	33
Exposure output (Pin 12, 13)	34
Line-sync output (Pin 14)	35
Frame-sync output (Pin 15)	36
GigE interface	37
Pin assignment of Gigabit Ethernet jack	37
Exposure control	38
Mode setting	39
Binning	40
Gain	41

Appendix	42
GigE Vision feature description for AVT Bigeye cameras	42
DeviceInformation	42
ImageSizeControl	43
AcquisitionControl	44
AnalogControls	44
CameraSpecialFeatures	45
Index	46

Contacting Allied Vision Technologies

Info



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Introduction

This **Bigeye Technical Manual** describes in depth the technical specifications, dimensions, all pixel formats, bandwidth and frame rate related subjects.

Note



Please read through this manual carefully.

We assume that you have read already the **How to install a GigE camera (Bigeye/Pearleye/Goldeye)** and that you have installed the hardware and software on your PC or laptop (GigE interface card, cables etc.).

<http://www.alliedvisiontec.com/emea/support/downloads/product-literature.html>

Document history

Version	Date	Description
V2.0.0	03.11.11	New Bigeye Technical Manual

Table 1: Document history

Manual overview

This **manual overview** outlines the contents of each chapter of this manual.

- Chapter [Contacting Allied Vision Technologies](#) on page 5 lists AVT contact data (phone numbers and URLs) for both:
 - Technical information / ordering
 - Commercial information
- Chapter [Introduction](#) on page 6 (this chapter) gives you the document history, a manual overview (short description of each chapter) and conventions used in this manual (styles and symbols).
- Chapter [Conformity](#) on page 9 gives you information about conformity of AVT cameras (CE, RoHS).
- Chapter [Specifications](#) on page 10 lists camera details and measured spectral sensitivity diagrams for each camera type.
- Chapter [Camera dimensions](#) on page 21 provides CAD drawings of standard housing models, tripod adapter.
- Chapter [Camera interfaces](#) on page 29 describes in general the inputs/outputs of the cameras (incl. trigger features).

- Chapter [Index](#) on page 46 gives you quick access to all relevant data in this manual.

Conventions used in this manual

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

Styles

Style	Function	Example
Bold	Programs, inputs or highlighting important things	bold
Courier	Code listings etc.	Input
Upper case	Register	REGISTER
Italics	Modes, fields	<i>Mode</i>
Parentheses and/or blue	Links	(Link)

Table 2: Styles

Symbols

Note This symbol highlights important information.



Caution This symbol highlights important instructions. You have to follow these instructions to avoid malfunctions.



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



Example:

<http://www.alliedvisiontec.com>

Before operation

We place the highest demands for quality on our cameras.

Target group This **Technical Manual** is the guide to detailed technical information of the camera and **is written for experts.**

Note Please read through this manual carefully before operating the camera.



Caution Before operating any AVT camera read the following **safety instructions** and **ESD warnings.**



Safety warnings

Caution **Electrostatic discharge**
The camera contains sensitive electronic components which can be destroyed by means of electrostatic discharge.
Use sufficient grounding to minimize the risk of damage.



Conformity

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

- CE, following the provisions of 2004/108/EG directive
- RoHS (2002/95/EC)

CE

We declare, under our sole responsibility, that the previously described **Bigeye** cameras conform to the directives of the CE.

Specifications

Note

The warranty becomes void in case of unauthorized tampering or any manipulations not approved by the manufacturer.



Bigeye P-132B

Feature	Specification
Image device	Type 2/3, progressive scan, Sony ICX 285AL, interline transfer sensor (no mechanical shutter required) EXView HAD
Effective chip size	8.62 mm (H) x 6.6 mm (V)
Cell size	6.45 μm x 6.45 μm
Picture size (max.)	1280 (H) x 1024 (V)
Lens mount	C-Mount
Pixel format	Mono8, Mono10, Mono12
Frame rate	up to 12.5 fps (full frame) up to 25 fps (binning: 1280 x 512)
ADC	14 bits
Exposure time	0.1 ms ... 1000 seconds in 76 μs steps
Digital output	12-bit, GigE
I/Os	Two inputs (one optocoupled) three outputs (one optocoupled)
Smart features	Vertical binning (1 x 2), switchable gain (+ 6 dB), continuous mode (image acquisition with maximum frame rate), image-on-demand mode (triggered image acquisition) With AVT AcquireControl: BCG LUT, auto contrast, auto brightness, analyze multiple regions within image, real-time statistics and histogram
Digital interface	IEEE 802.3 1000BASE-T (GigE Vision V1.2)
Power requirements	+ 12 V (+5 %), max. 0.8 A
Dimensions	89 mm x 90 mm x 71 mm (L x W x H); incl. connectors, without tripod and lens
Mass	790 g (without lens)

Table 3: Specification Bigeye P-132B

Feature	Specification
Environmental air temperature	0 °C ... 35 °C
Regulations	CE, RoHS (2002/95/EC)

Table 3: Specification Bigeye P-132B

Note

The design and specifications for the products described above may change without notice.



Note

- The right polarization of the 12 V supply voltage has to be taken into consideration.
- The warranty becomes void in case of unauthorized tampering or any manipulations not approved by the manufacturer.



Bigeye P-132B/C Cool / Bigeye P-132B Solar Cool

Feature	Specification
Image device	Type 2/3, progressive scan, Sony ICX 285AL, interline transfer sensor (no mechanical shutter required) ExView HAD
Effective chip size	8.62 mm (H) x 6.6 mm (V)
Cell size	6.45 μm x 6.45 μm
Picture size (max.)	1280 (H) x 1024 (V)
Lens mount	C-Mount
ADC	14 bits
Pixel format	Mono8, Mono10, Mono12 Bigeye P-132C Cool: additional BayerGB8, BayerGB10, BayerGB12
Frame rate	up to 12.5 fps (full frame) up to 25 fps (binning Cool: 1280 x512, binning Solar: 640 x 512)
Exposure time	100 μs ... 1000 seconds in adjustable in 76 μs steps
Cooling	Peltier cooling - 20 $^{\circ}\text{C}$ regulated (up to 25 $^{\circ}\text{C}$ ambient temperature)
Digital output	12-bit, GigE
I/Os	Two inputs (one optocoupled) three outputs (one optocoupled)
Smart features	Binning (Cool: 1 x 2; Solar: 2 x2) , Gain (+ 6 dB), continuous mode (image acquisition with maximum frame rate), image-on-demand mode (triggered image acquisition) With AVT AcquireControl: BCG LUT, auto contrast, auto brightness, analyze multiple regions within image, real-time statistics and histogram
Digital interface	IEEE 802.3 1000BASE-T (GigE Vision V1.2)
Power requirements	+ 12 V (+ 5 %), max. 2.8 A
Dimensions	111 mm x 90 mm x 99 mm (L x W x H); incl. connectors, without tripod and lens
Mass	1410 g (without lens)
Operating temperature	0 $^{\circ}\text{C}$... 35 $^{\circ}\text{C}$
Regulations	CE, RoHS (2002/95/EC)

Table 4: Specification Bigeye P-132B/C Cool, Bigeye P-132B Solar Cool

Note

The design and specifications for the products described above may change without notice.



Note

- The right polarization of the 12 V supply voltage has to be taken into consideration.
- The two hexagon socket screws (M 5) in the front plate may in no case be loosened as otherwise the vacuum area is getting leaky.
- The warranty becomes void in case of unauthorized tampering or any manipulations not approved by the manufacturer.



Bigeye P-629B Cool / P-629B Solar Cool

Feature	Specification
Image device	Type 35 mm, CCD progressive scan, Kodak KAF-6303E, full-frame transfer sensor
Effective chip size	27.65 mm (H) x 18.48 mm (V)
Cell size	9.00 μm x 9.00 μm
Picture size (max.)	3072 (H) x 2048 (V)
Lens mount	F-Mount
Shutter	50 ms ... 30 min. (built-in electromechanical long-live shutter: min. 1×10^6 cycles)
Pixel format	Mono8, Mono10, Mono12, Mono14, Mono16
Frame rate	up to 0.5 fps (full frame) up to 1 fps (binning: 1536 x 1024)
Readout time	1.35 s at 3072 x 2048 0.4 s at 1536 x 1024
Exposure time	50 ms ... 30 min.
Cooling	Peltier cooling +5 °C stabilized
ADC	14 bits
Digital output	14-bit, GigE
I/Os	Two inputs (one optocoupled) three outputs (one optocoupled)
Smart features	Binning (2 x 2), switchable gain (+ 6 dB), continuous mode (image acquisition with maximum frame rate), image-on-demand mode (triggered image acquisition) With AVT AcquireControl: BCG LUT, auto contrast, auto brightness, analyze multiple regions within image, real-time statistics and histogram
Digital interface	IEEE 802.3 1000BASE-T (GigE Vision V1.2)
Power requirements	+ 12 V (+ 5 %), approx. 1.3 A ... 2.8 A
Dimensions	141.75 mm x 90 mm x 109 mm (L x W x H); incl. connectors, without tripod and lens
Mass	1480 g (without lens)
Operating temperature	0 °C ... 35 °C
Regulations	CE, RoHS (2002/95/EC)

Table 5: Specification Bigeye P-629B Cool / P-629B Solar Cool

Note

The design and specifications for the products described above may change without notice.



Note

- The right polarization of the 12 V supply voltage has to be taken into consideration.
- The warranty becomes void in case of unauthorized tampering or any modifications not approved by the manufacturer.



Bigeye P-1100B/C Cool

Feature	Specification
Image device	Type 35 mm, CCD progressive scan, Kodak KAI11002, interline transfer sensor (IT) (no mechanical shutter required) global shutter
Effective chip size	36.18 mm (H) x 24.12 mm (V)
Cell size	9.00 μm x 9.00 μm
Picture size (max.)	4024 (H) x 2680 (V)
Lens mount	F-Mount
Electronic shutter	Asynchronous up to 1/1000 s (image-on-demand), adjustable in 232 μs steps
Frame rate	up to 1.6 fps (full frame) up to 3.2 fps (binning: 4024 x 1340)
Exposure time	1 ms ... 60 seconds
Cooling	Peltier cooling 0 °C stabilized
ADC	14
Digital output	12-bit, GigE
I/Os	Two inputs (one optocoupled), three outputs (one optocoupled)
Smart features	Vertical binning (1 x 2), switchable gain (+ 6 dB), continuous mode (image acquisition with maximum frame rate), image-on-demand mode (triggered image acquisition) With AVT AcquireControl: BCG LUT, auto contrast, auto brightness, analyze multiple regions within image, real-time statistics and histogram
Video gain	1 or 2 (+ 6 dB)
Digital interface	IEEE 802.3 1000BASE-T (GigE Vision V1.2)
Power requirements	+ 12 V (+ 5 %), max. approx. 3.0 A
Dimensions	143 mm x 90 mm x 99 mm (L x W x H); incl. connectors, without tripod and lens
Mass	1450 g (without lens)
Operating temperature	0 °C ... 40 °C
Regulations	CE, RoHS (2002/95/EC)

Table 6: Specification Bigeye P-1100B/C Cool

Note

The design and specifications for the products described above may change without notice.



Note

- The right polarization of the 12 V supply voltage has to be taken into consideration.
- The warranty becomes void in case of unauthorized tampering or any manipulations not approved by the manufacturer.



Spectral sensitivity

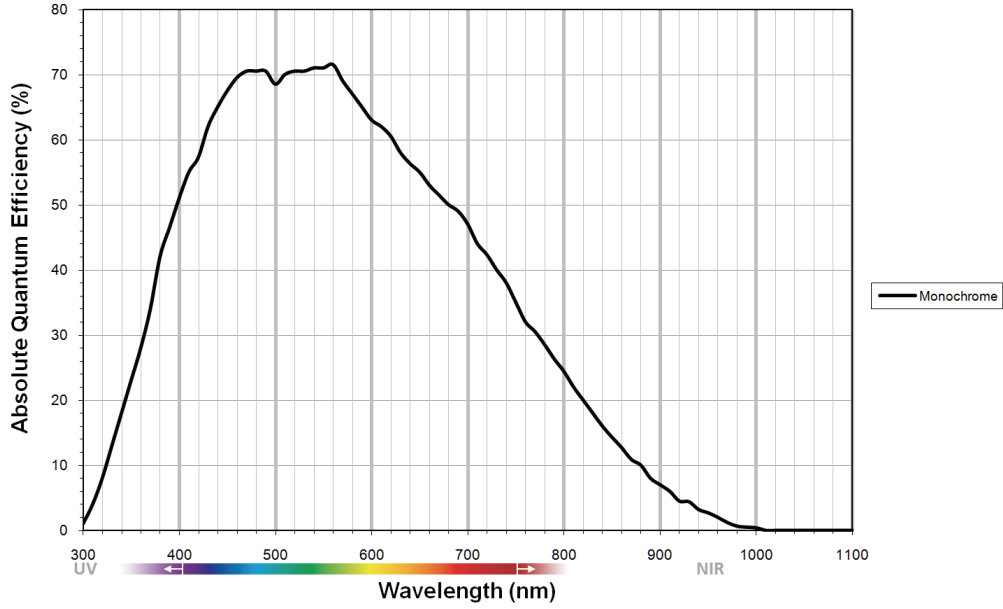


Figure 1: Spectral sensitivity of Bigeye P-132B / P-132B Cool

Spectral sensitivity

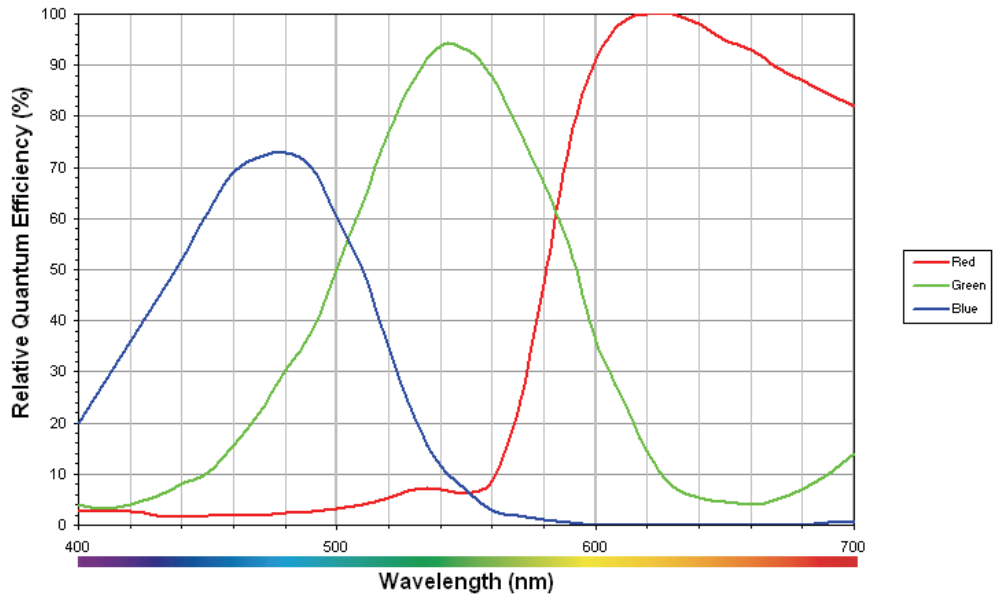


Figure 2: Spectral sensitivity of Bigeye P-132C Cool

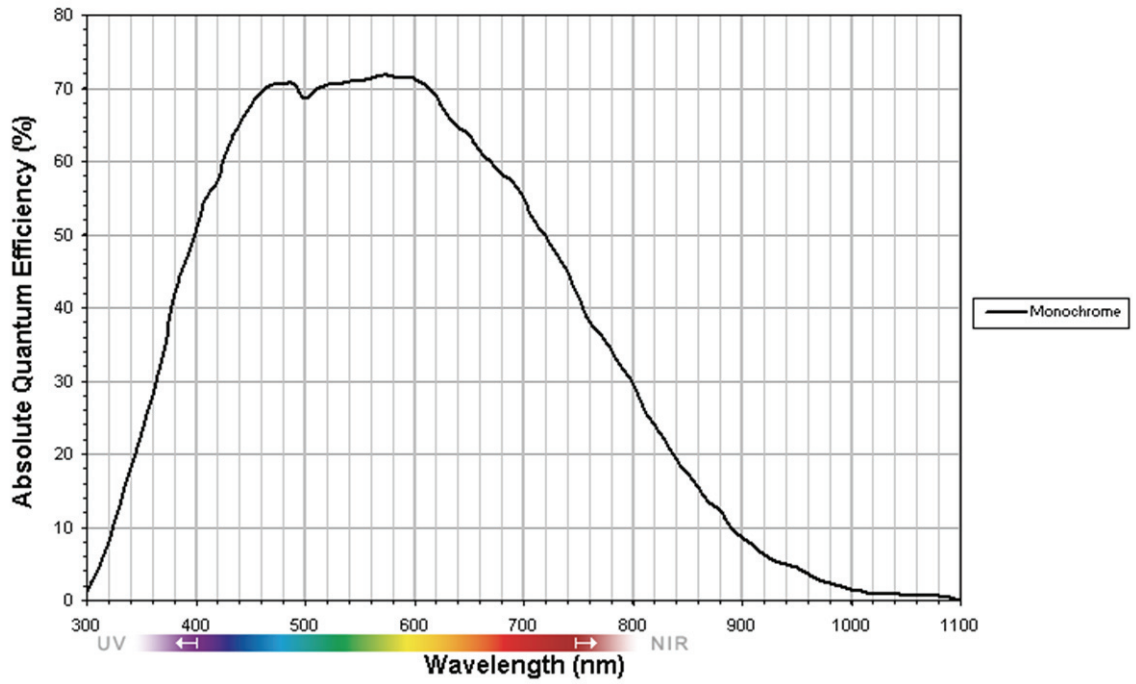


Figure 3: Spectral sensitivity of Bigeye P-132B Solar Cool

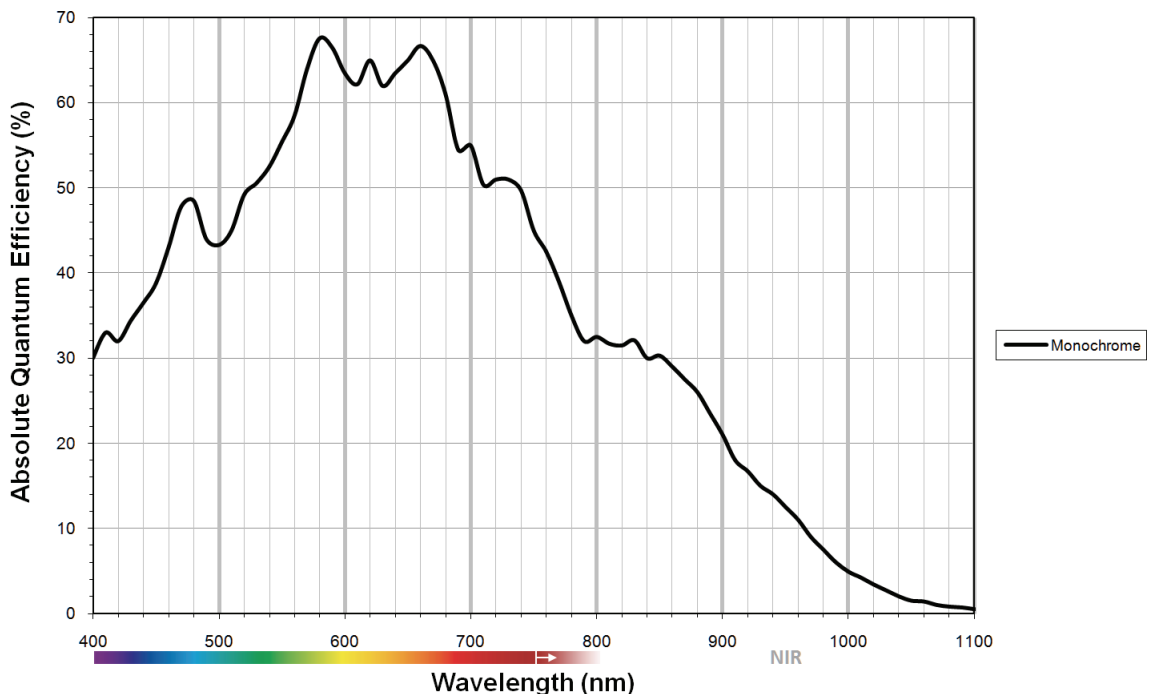


Figure 4: Spectral sensitivity of Bigeye P-629B Cool / P-629B Solar Cool

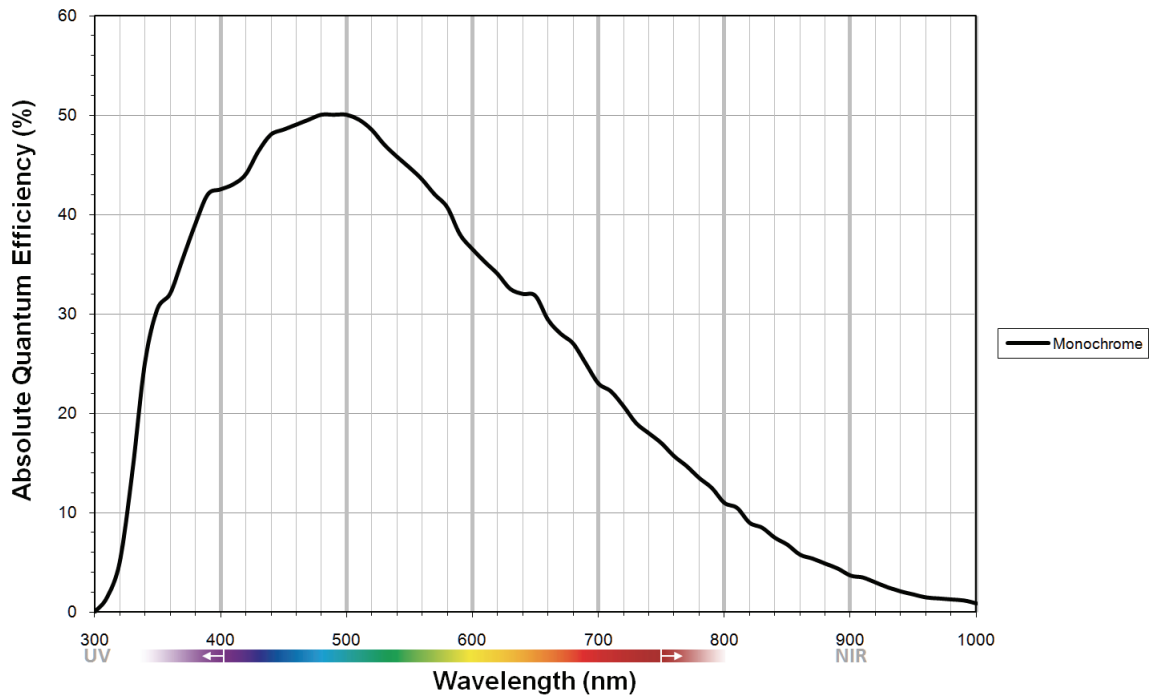


Figure 5: Spectral sensitivity of Bigeye P-1100B Cool

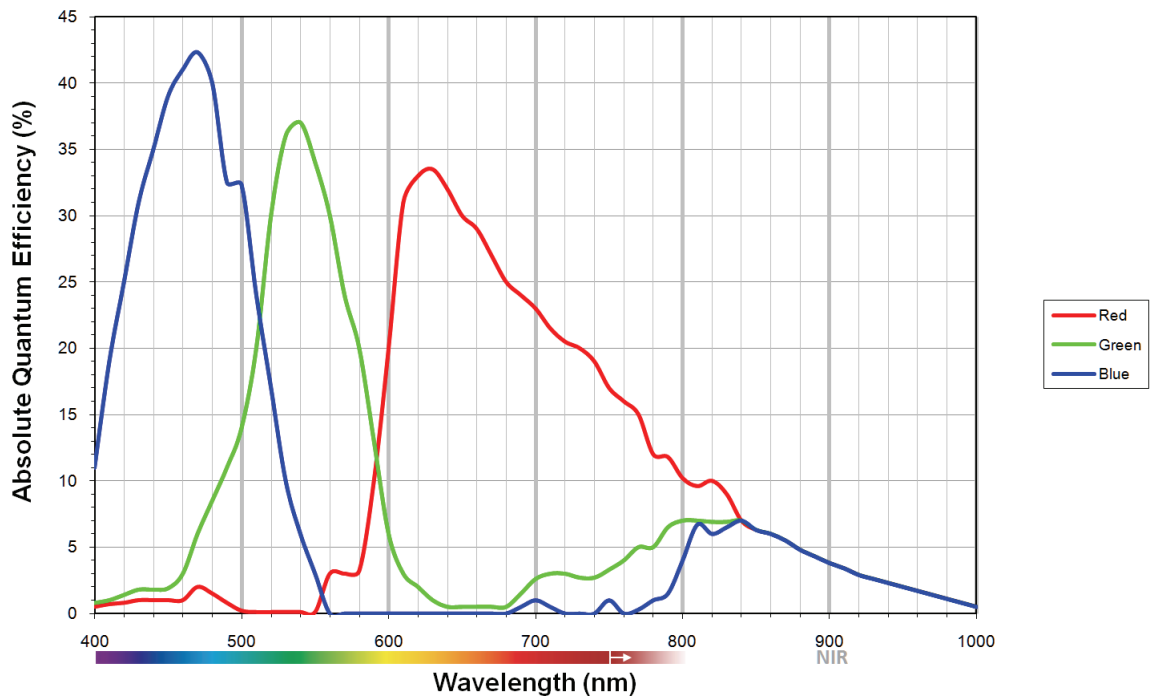


Figure 6: Spectral sensitivity of Bigeye P-1100C Cool

Camera dimensions

Bigeye P-132B

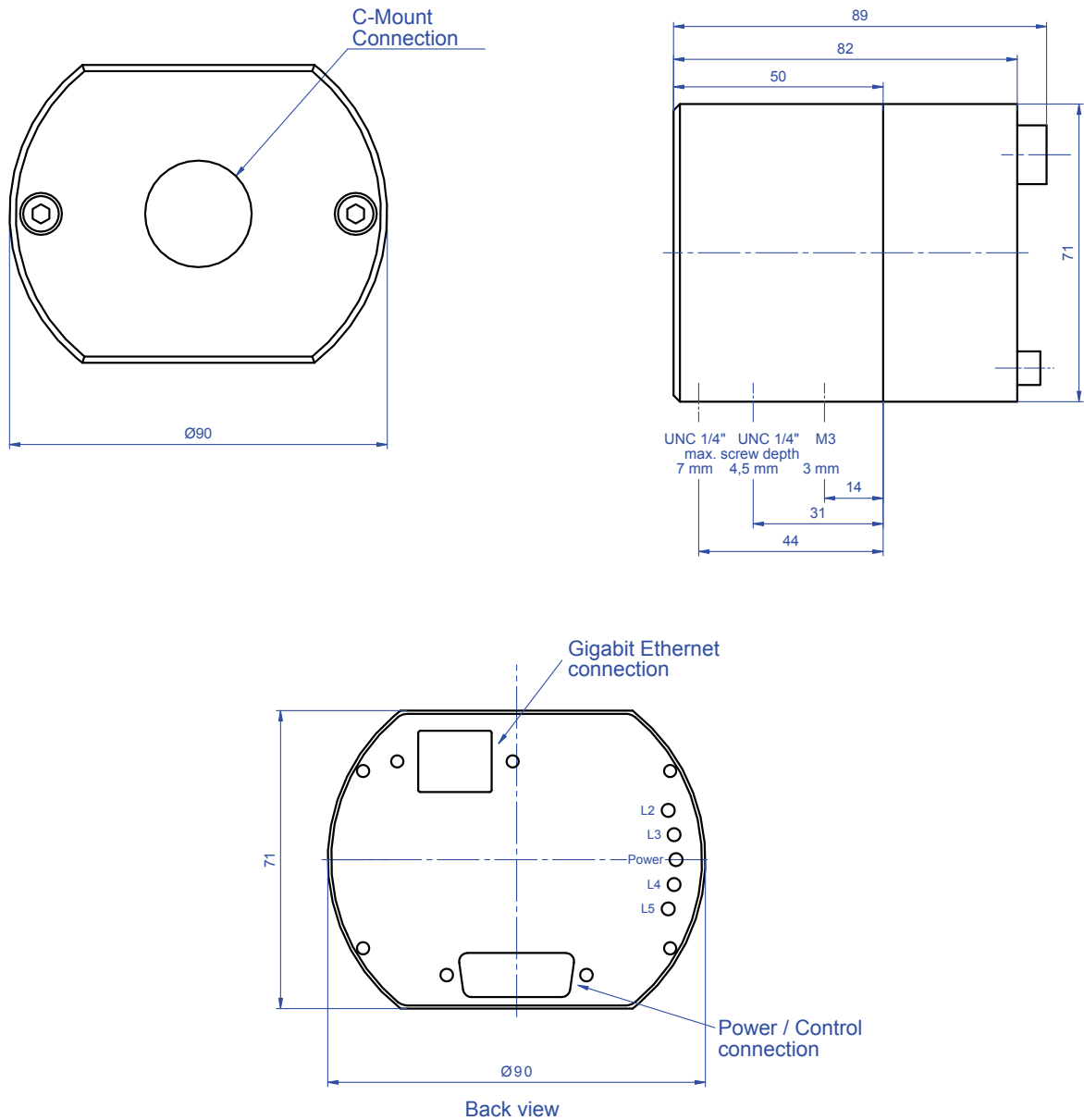


Figure 7: Camera dimensions: Bigeye P-132B (front/side/back)

LED	Color	Description
L2	Red	Camera is operational
L3	Red	Image-on-demand mode
Power	Green	Power indicator
L4	Red	Exposure input activity
L5	Red	Frame output activity

Table 7: Description of LEDs: Bigeye P-132B

Bigeye P-132B/C Cool and P-132B Solar Cool

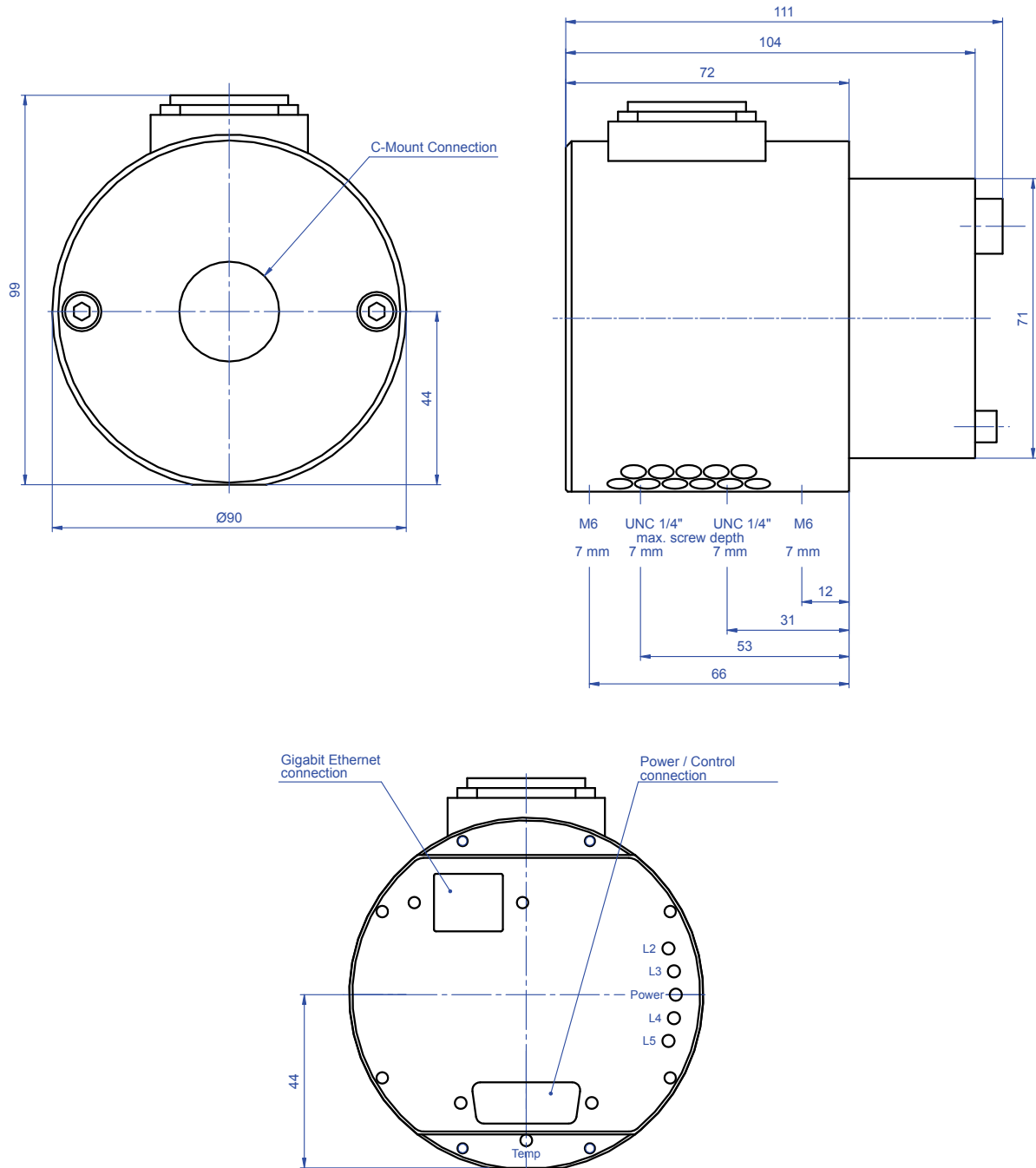


Figure 8: Camera dimensions: Bigeye P-132B/C Cool and P-132B Solar Cool (front/side/back)

LED	Color	Description
L2	Red	Camera is operational
L3	Red	Temperature state (same function as Temp LED)
Power	Green	Power indicator
L4	Red	Exposure input activity
L5	Red	Frame output activity
Temp	Red	Indicates that cooling temperature has not reached approx. -20 °C. If this LED is permanently lit during operation, then the temperature of the camera might be too high: Check the ambient temperature and ensure unhindered air flow.

Table 8: Description of LEDs: Bigeye P-132B/C Cool and P-132B Solar Cool

Bigeye P-629B Cool / Solar Cool

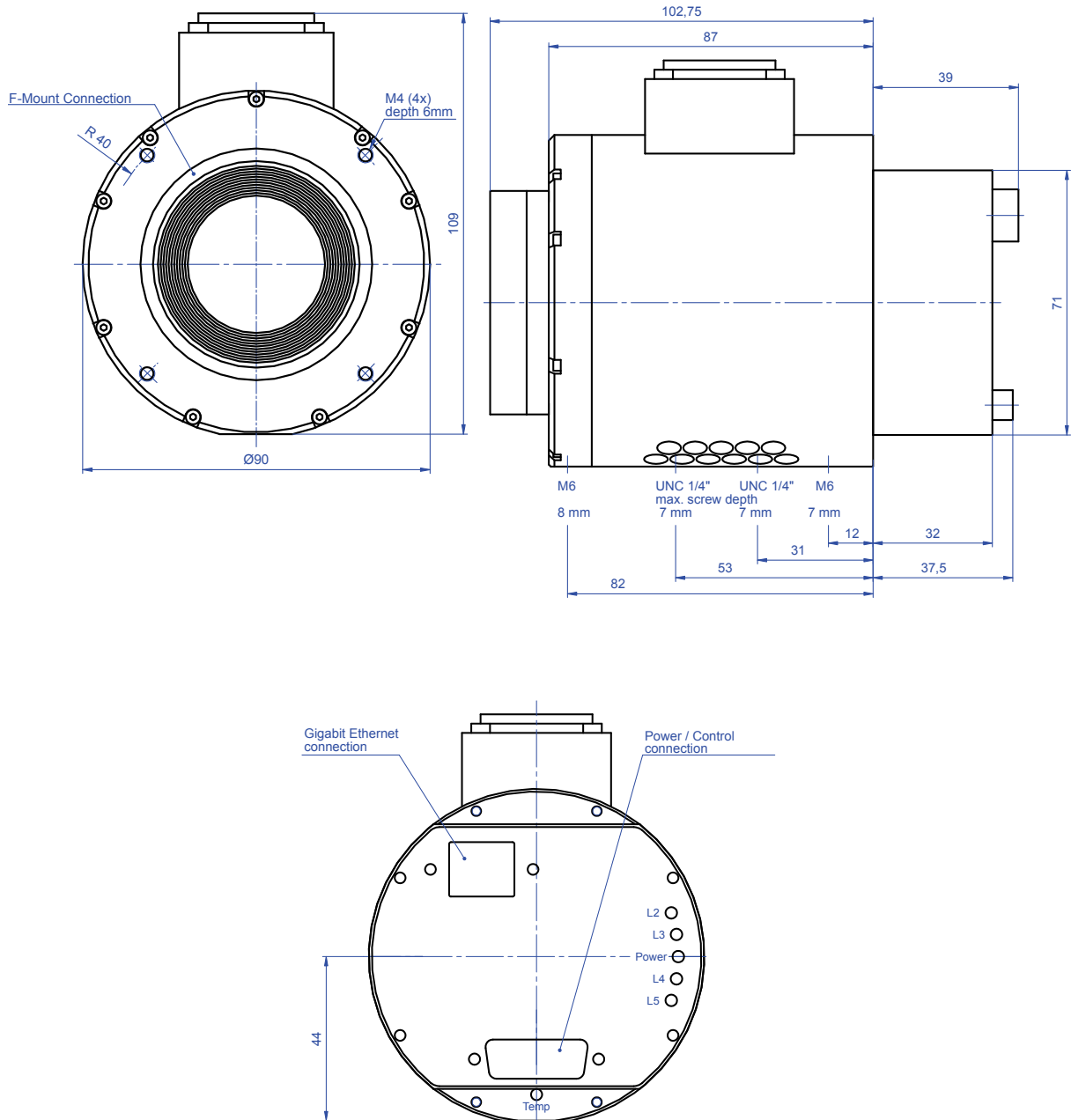


Figure 9: Camera dimensions: Bigeye P-629B Cool / Solar Cool (front/side/back)

LED	Color	Description
L2	Red	Camera is operational
L3	Red	Temperature state (same function as Temp LED)
Power	Green	Power indicator
L4	Red	Exposure input activity
L5	Red	Frame output activity
Temp	Red	Indicates that cooling temperature has not reached approx. +5 °C. If this LED is permanently lit during operation, then the temperature of the camera might be too high: Check the ambient temperature and ensure unhindered air flow.

Table 9: Description of LEDs: Bigeye P-629B Cool and Bigeye P-629B Solar Cool

Bigeye P-1100B/C Cool

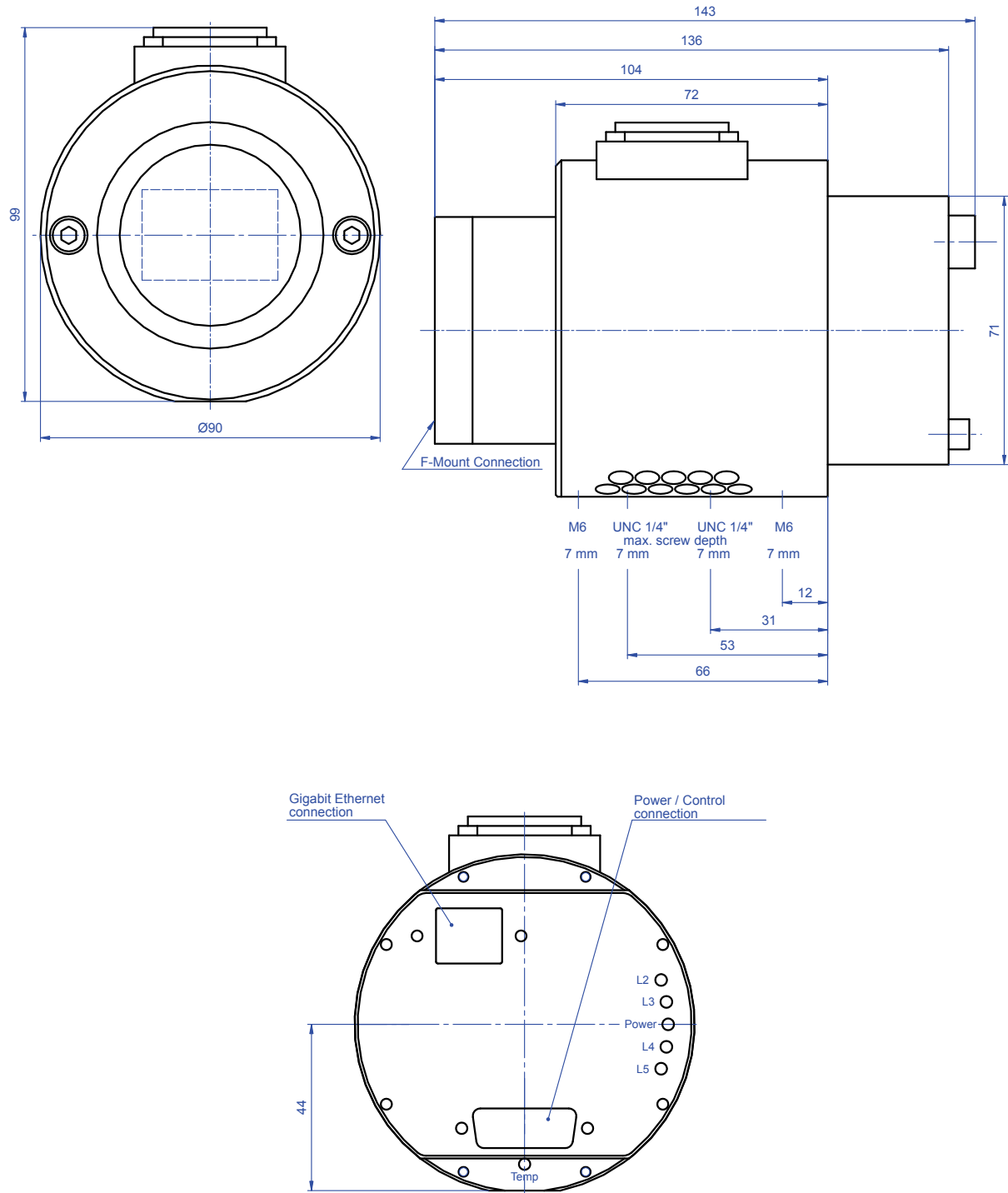


Figure 10: Camera dimensions: Bigeye P-1100B/C Cool (front/side/back)

LED	Color	Description
L2	Red	Camera is operational
L3	Red	Image-on-demand mode
Power	Green	Power indicator
L4	Red	Exposure input activity
L5	Red	Frame output activity
Temp	Red	Indicates that cooling temperature has not reached approx. 0 °C. If this LED is permanently lit during operation, then the temperature of the camera might be too high: Check the ambient temperature and ensure unhindered air flow.

Table 10: Description of LEDs: Bigeye P-1100B/C Cool

Camera interfaces

This chapter gives you information on the control junction, inputs and outputs and trigger features.

www



For accessories like cables see:

<http://www.alliedvisiontec.com/emea/products/accessories/gige-accessories.html>

Control junction

Camera I/O connector pin assignment (15-pin D-Sub jack)

This jack is intended for the power supply as well as for controlling the camera by the user.

Bigeye P-132B / P-132B Cool / P-132B Solar Cool

Pin	Signal	Direction	Level	Description
1	External Power		+12 V DC	Power supply max. 2.8 A
2				
3	External GND			
4				
5	---			Reserved
6	---			Reserved
7	RXD	In	RS232	Serial control
8	TXD	Out	RS232	Serial control
9	Mode input	+	12V, 20 mA max.	Internal pull-up resistor
10	Trigger input	-	12V, 20 mA max.	Optocoupler input
11		+		
12	Exposure output	-	12V, 20 mA max.	Optocoupler output
13		+		
14	Line-sync output	Out	5 V (at no load)	Active low
15	Frame-sync output	Out	5 V (at no load)	Active low

Figure 11: Camera I/O connector pin assignment (Bigeye P-132B/Cool/Solar Cool)

This jack is intended for the power supply as well as for controlling the camera by the user.

Bigeye P-629B Cool/Solar Cool

Pin	Signal	Direction	Level	Description
1	External Power		+12 V DC	Power supply 1.3 A ... max. 2.8 A
2				
3	External GND			
4				
5	---			Reserved
6	---			Reserved
7	RXD	In	RS232	Serial control
8	TXD	Out	RS232	Serial control
9	Mode input	+	12V, 20 mA max.	Internal pull-up resistor
10	Trigger input	-	12V, 20 mA max.	Optocoupler input
11		+		
12	Exposure output	-	12V, 20 mA max.	Optocoupler output
13		+		
14	Line-sync output	Out	5 V (at no load)	Active low
15	Frame-sync output	Out	5 V (at no load)	Active low

Figure 12: Camera I/O connector pin assignment (Bigeye P-629B Cool/Solar Cool)

This jack is intended for the power supply as well as for controlling the camera by the user.

Bigeye P-1100B Cool / P-1100C Cool

Pin	Signal	Direction	Level	Description
1	External Power		+12 V DC	Power supply max. 3.0 A
2				
3	External GND			
4				
5	---			Reserved
6	---			Reserved
7	RXD	In	RS232	Serial control
8	TXD	Out	RS232	Serial control
9	Mode input	+	12V, 20 mA max.	Internal pull-up resistor
10	Trigger input	-	12V, 20 mA max.	Optocoupler input
11		+		
12	Exposure output	-	12V, 20 mA max.	Optocoupler output
13		+		
14	Line-sync output	Out	5 V (at no load)	Active low
15	Frame-sync output	Out	5 V (at no load)	Active low

Figure 13: Camera I/O connector pin assignment (Bigeye P-1100B/C Cool)

Power supply (Pin 1-4)

- Bigeye P-132** The camera requires 12 V +5% at a current capacity of maximum 0.8 A. After attaining the end cooling temperature (- 20 °C) the current capacity goes down to approx. 1.9 ... 2.3 A. The exact value also depends on the ambient temperature of the camera (not for Bigeye P-132B, because it is uncooled).
- Bigeye P-629** The camera requires 12 V +5% at a current capacity of maximum 2.8 A. After attaining the end cooling temperature (- 20 °C) the current capacity goes down to approx. 1.3 ... 1.7 A. The exact value also depends on the ambient temperature of the camera.
- Bigeye P-1100** The camera requires 12 V +5% at a current capacity of maximum 3.0 A.

Mode input (Pin 9)

The mode input provides a method for switching the camera between different exposure control modes using an externally applied signal.

The individual function depends on the camera variant. The GigE Vision feature AcquisitionControl/TriggerMode can be used to switch the mode via software.

Note



- For more information see Chapter [Mode setting](#) on page 39.
- The active state (externally *low* or TriggerMode = *On*) is dominant, thus image-on-demand mode is active, if one of either settings is.

Bigeye P-132 The mode input switches between the continuous free-running operation with fixed 80 ms exposure time on the one hand and the image-on-demand mode (IOD) on the other hand.

For long-term exposures the image-on-demand mode (IOD mode) generally has to be activated. As a cooling of the sensor is only advantageous at longer exposure times, the cooling is generally only activated in the IOD mode. In the continuous mode the cooling is switched off. This feature allows to reduce the power consumption of the camera during standby. After re-enabling the IOD mode a cooling time of approx. 4 – 5 minutes is needed.

Input pin 9: open (or TTL high) ⇒ continuous operation (cooling off)
 GND (or TTL low) ⇒ image-on-demand (cooling active)

Bigeye P-629 This camera variant is always in image-on-demand mode and does not support continuous mode. Instead, this signal controls the behavior of the mechanical shutter.

The shutter is automatically closed during the read-out of the sensor, in order that no smear will take place. In case a pulsed light source is used, the shutter needs not to be closed. This can be forced by the corresponding mode setting.

Input pin 9: open (or TTL high) ⇒ shutter permanently open
 GND (or TTL low) ⇒ shutter closed during image output

Bigeye P-1100 The mode input switches between the continuous free-running operation with fixed 635 ms exposure time on the one hand and the image-on-demand mode (IOD mode) on the other hand.

For long-term exposures the image-on-demand mode (IOD mode) generally has to be activated. As a cooling of the sensor is only advantageous at longer exposure times, the cooling is generally only activated in the IOD mode. In the continuous mode the cooling is switched off. This feature allows to reduce the power consumption of the camera during standby. After re-enabling the IOD mode a cooling time of approx. 4 – 5 minutes is needed.

After switching to image-on-demand mode a break of at least 635 ms has to occur before the first image exposure can take place.

Input pin 9: open (or TTL high) ⇒ continuous operation (cooling off)
 GND (or TTL low) ⇒ image-on-demand (cooling active)

Trigger input (Pin 10, 11)

This input allows control of the electronic or electromechanical shutter by an externally applied signal. It is necessary to switch the camera into image-on-demand mode to enable direct exposure control.

Note For more information on image-on-demand mode: see Chapter [Mode setting](#) on page 39.



The signal is level-sensitive, thus the HIGH duration directly dictates the exposure time of the camera.

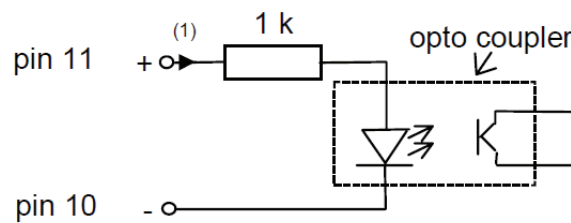


Figure 14: Trigger input diagram

The current through the opto coupler (1) should be greater than 1 mA and not exceed 20 mA:

5 ... 12V (HIGH)	Active exposure (only valid during IOD mode)
<0.8 V (LOW)	Inactive (falling edge starts frame output)

Exposure output (Pin 12, 13)

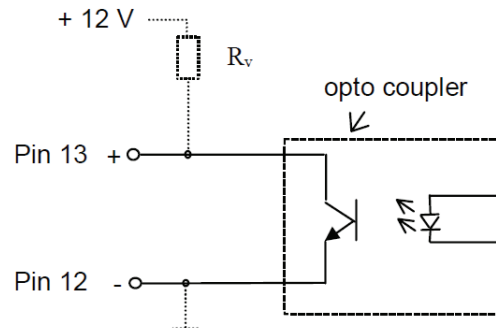


Figure 15: Exposure output

Caution The current which flows through the optocoupler should not exceed 20 mA (at 12 V $R_v \geq 600 \Omega$).



- Bigeye P-132** The exposure output indicates the active exposure time of the sensor.
Usage: synchronize an external strobe light source.
At the end of the exposure this output stays active approx. 76 μs (1 line) longer than the real exposure. The active exposure is indicated in the image-on-demand operation also by the LED **L4** on the backside of the camera. For using the exposure output an external resistor R_v according to the drawing has to be applied.
After the end of image exposure the 1024 active lines of the image are transmitted. This image output is displayed by LED L5 at the backside of the camera.
- Bigeye P-629** The exposure output indicates the active exposure time of the sensor.
Usage: synchronize an external strobe light source.
At the end of the exposure this output stays active approx. 658 μs (1 line) longer than the real exposure. The active exposure is indicated in the image-on-demand operation also by the LED **L4** on the backside of the camera. For using the exposure output an external resistor R_v according to the drawing has to be applied.
After the end of image exposure the 2048 active lines of the image are transmitted. This image output is displayed by LED L5 at the backside of the camera.
- Bigeye P-1100** The exposure output indicates the active exposure time of the sensor.
Usage: synchronize an external strobe light source.

At the end of the exposure this output stays active approx. 232 μs (1 line) longer than the real exposure. The active exposure is indicated in the image-on-demand operation also by the LED **L4** on the backside of the camera. For using the exposure output an external resistor R_v according to the drawing has to be applied.

After the end of image exposure the 2680 active lines of the image are transmitted. This image output is displayed by LED **L5** at the backside of the camera.

Line-sync output (Pin 14)

Bigeye P-132

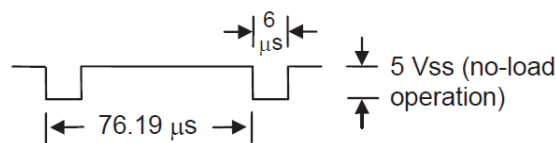


Figure 16: Line-sync output (**Bigeye P-132**)

The line-sync output (active low) supplies approx. 1200 mV at a termination with 75 Ω .

Bigeye P-629

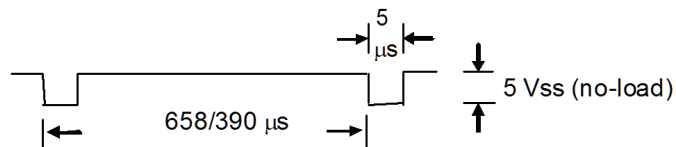


Figure 17: Line-sync output (**Bigeye P-629**)

The line-sync output (active low) supplies approx. 900 mV at a termination with 75 Ω .

Bigeye P-1100

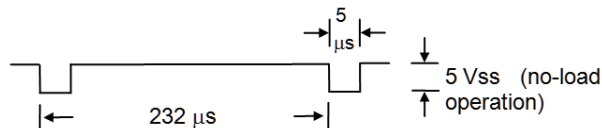


Figure 18: Line-sync output (**Bigeye P-1100**)

The line-sync output (active low) supplies approx. 1200 mV at a termination with 75 Ω .

Frame-sync output (Pin 15)

Bigeye P-132 The frame-sync output is only active in continuous operation.

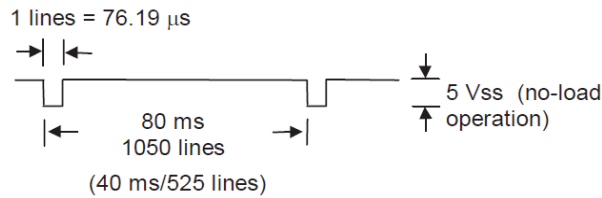


Figure 19: Frame-sync output (**Bigeye P-132**)

The frame-sync output (active low) supplies approx. 1200 mV at a termination with 75 Ω .

Bigeye P-629 The frame-sync output becomes active at the beginning of an image output.

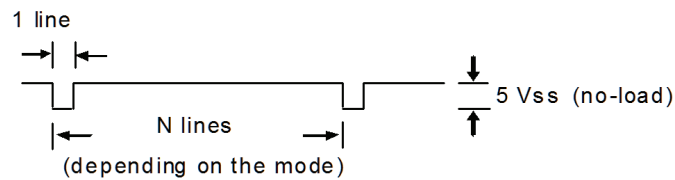


Figure 20: Frame-sync output (**Bigeye P-629**)

The frame-sync-output (active low) supplies approx. 900 mV at a termination with 75 Ω .

Bigeye P-1100 The frame-sync output is only active in continuous operation.

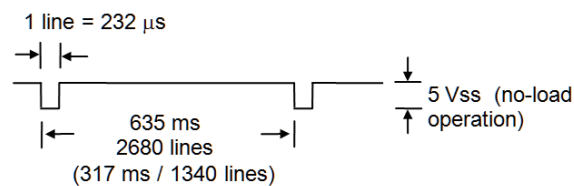


Figure 21: Line-sync output (**Bigeye P-1100**)

The frame-sync-output (active low) supplies approx. 1200 mV at a termination with 75 Ω .

GigE interface

The Bigeye cameras are equipped with a 1000Base-T Ethernet interface. The data connection between camera and PC can be established via a standard CAT5e patch cable to a 1000Base-T compatible Ethernet adapter card.

To control the Bigeye cameras use the AVT AcquireControl software or any GigE Vision V1.2 compliant 3rd party software package.

Pin assignment of Gigabit Ethernet jack

The **Bigeye P-008/032** cameras are equipped with a 1000Base-T Ethernet interface (RJ-45 connector). The data connection between camera and PC can be established via a standard CAT5e patch cable.

Note For more information see the **Pleora iPORT PT1000-VB Documentation**.

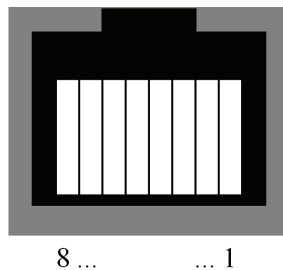


Figure 22: Front view of the Gigabit Ethernet jack

Pin	Signal
1	D1+
2	D1-
3	D2+
4	D3+
5	D3-
6	D2-
7	D4+
8	D4-

Table 11: GigE jack: pin assignment

Exposure control

Exposure time and dark time can be controlled using the features from the branch **AcquisitionControl** of the GigE Vision feature tree.

tbd: More detailed explanation of timing constraints (regarding frame rate and exposure time) of the individual camera models.

AcquisitionControl

Feature	Description
AcquisitionMode	This feature controls the acquisition mode of the software. This feature works independently (!) of the chosen camera mode (Continuous, IOD hardware trigger, IOD hardware timer). It describes how many frames should be acquired.
AcquisitionStart	Starts the image acquisition of the camera.
AcquisitionStop	Stops the image acquisition of the camera.
TriggerMode	Modifies the trigger mode of the camera. When the trigger mode is "Off", the camera will generate frames independently. When the trigger mode is "On" the camera is switched to the so called IOD (Image On Demand) mode. In this mode the camera waits for an external trigger signal or a timer pulse generated internally. To control exposure and dark time trigger mode must be switched to "On".
ExposureMode	Start or stop the internal exposure signal timer.
ExposureTime	This feature is used to set the Exposure time (in microseconds).
ExposureTimeAbs	This feature is used to set the Exposure time (in microseconds).
ExposureTimeGranularity	Exposure time granularity
ExposureTimeAbsMs	This feature is used to set the Exposure time (in milliseconds).
DarkTime	This feature is used to set the Dark time (in microseconds).
DarkTimeAbs	This feature is used to set the Dark time (in microseconds).
DarkTimeGranularity	Dark time granularity
DarkTimeAbsMs	This feature is used to set the Dark time (in milliseconds).

Table 12: Camera standard feature: AcquisitionControl

Note



Bigeye P-132, Bigeye P-1100: The TriggerMode feature has to be set to **On** and the timer has to be enabled via ExposureMode in order to control the exposure.

Note



Bigeye P-629: The timer has to be enabled via the ExposureMode feature in order to control the exposure. Set the TriggerMode feature to **On** if the electromechanical shutter operation is needed, otherwise it will stay permanently open.

Beside the internal exposure control capabilities also direct exposure control by an externally applied signal is possible. In this case the ExposureMode has to be configured to **Off** to deactivate the internal timer.

Mode setting

The GigE Vision feature AcquisitionControl/TriggerMode setting provides a method for switching the camera between different exposure control modes. The individual function depends on the camera variant.

The *Mode input (Pin 9)* can be used to control this setting using an external signal.

Note



For more information see Chapter [Mode input \(Pin 9\)](#) on page 32.

Note



The active state (externally *low* at pin 9 or TriggerMode = **On**) is dominant, thus image-on-demand is active if one of either settings is.

Camera	TriggerMode	Description
Bigeye P-132B	On	Image-on-demand mode. Exposure control via ExposureTime and DarkTime features (ExposureMode = Timed) or externally (ExposureMode = Off).
	Off	Continuous mode with fixed exposure time and frame rate.
Bigeye P-132x Cool	On	Image-on-demand mode. Peltier cooling active. Exposure control via ExposureTime and DarkTime features (ExposureMode = Timed) or externally (ExposureMode = Off).
	Off	Continuous mode with fixed exposure time and frame rate. Peltier cooling inactive (power saving).

Table 13: TriggerMode

Camera	TriggerMode	Description
Bigeye P-629	On	Image-on-demand mode. Electromechanical shutter enabled. Exposure control via ExposureTime and DarkTime features (ExposureMode = Timed) or externally (ExposureMode = Off).
	Off	Image-on-demand mode. Electromechanical shutter always open. Exposure control via ExposureTime and DarkTime features (ExposureMode = Timed) or externally (ExposureMode = Off).
Bigeye P-1100	On	Image-on-demand mode. Peltier cooling active. Exposure control via ExposureTime and DarkTime features (ExposureMode = Timed) or externally (ExposureMode = Off).
	Off	Continuous mode with fixed exposure time and frame rate. Peltier cooling inactive (power saving).

Table 13: TriggerMode

Binning

Each Bigeye camera variant supports one distinct binning configuration (either 1 x 2 or 2 x 2) which can be switched on or off.

This is controlled using the GigE Vision features **BinningVertical** and **BinningHorizontal** from the ImageSizeControl branch of the feature tree.

In the case of 2 x 2 binning the two features are coupled. This if one of **BinningVertical** or **BinningHorizontal** is changed, the counterpart is automatically changed, too.

ImageSizeControl

Feature	Description
BinningVertical	Number of horizontal photo-sensitive cells to combine together. This increases the intensity (or signal-to-noise ratio) of the pixels and reduces the horizontal resolution (width) of the image.
BinningHorizontal	Number of vertical photo-sensitive cells to combine together. This increases the intensity (or signal-to-noise ratio) of the pixels and reduces the vertical resolution (height) of the image.

Table 14: Camera standard feature: ImageSizeControl

Gain

Use the GigE Vision feature Gain from the feature branch AnalogControls to change the analog gain setting.

Value **1** selects 0 dB gain and Value **2** switches to +6 dB gain.

AnalogControls

Feature	Description
Gain	This feature controls the selected gain as a raw integer value.

Table 15: Camera standard feature: AnalogControls

Appendix

GigE Vision feature description for AVT Bigeye cameras

DeviceInformation

Feature	Description
DeviceModeName	Name of the attached camera model.
DeviceID	Unique 32 bit device ID of the AVT camera model.
DeviceUserID	User ID field. This field can be accessed (R/W) by the user to store an additional device identifier.
DeviceScanType	This feature specifies the scan type of the sensor (Areascan or Linescan).

Table 16: Standard: DeviceInformation

ImageSizeControl

Feature	Description
SensorWidth	Maximum width of the sensor in pixels.
SensorHeight	Maximum height of the sensor in pixels.
WidthMax	This feature represents the maximum width (in pixels) of the image after horizontal binning, decimation or any other function changing the horizontal dimensions of the image.
HeightMax	This feature represents the maximum height (in pixels) of the image after vertical binning, decimation or any other function changing the vertical dimensions of the image.
Width	This feature represents the actual image width expelled by the camera (in pixels).
Height	This feature represents the actual image height expelled by the camera (in pixels).
OffsetX	This feature represents the horizontal offset from the origin to the AOI (in pixels).
OffsetY	This feature represents the vertical offset from the origin to the AOI (in pixels).
BinningVertical	Number of horizontal photo-sensitive cells to combine together. This increases the intensity (or signal-to-noise ratio) of the pixels and reduces the horizontal resolution (width) of the image.
BinningHorizontal	Number of vertical photo-sensitive cells to combine together. This increases the intensity (or signal-to-noise ratio) of the pixels and reduces the vertical resolution (height) of the image.
DecimationHorizontal	Unused.
DecimationVertical	Unused.
PixelFormat	List with all available pixel formats of the camera, e.g. MONO12.
TestImageSelector	Enables or disables the internal test image generator of the camera.

Table 17: Camera standard feature: ImageSizeControl

AcquisitionControl

Feature	Description
AcquisitionMode	This feature controls the acquisition mode of the software. This feature works independently (!) of the chosen camera mode (Continuous, IOD hardware trigger, IOD hardware timer). It describes how many frames should be acquired.
AcquisitionStart	Starts the image acquisition of the camera.
AcquisitionStop	Stops the image acquisition of the camera.
TriggerMode	Modifies the trigger mode of the camera. When the trigger mode is "Off", the camera will generate frames independently. When the trigger mode is "On" the camera is switched to the so called IOD (image-on-demand) mode. In this mode the camera waits for an external trigger signal or an timer pulse generated internally. To control exposure and dark time, trigger mode must be switched to "On".
ExposureMode	Start or stop the internal exposure signal timer.
ExposureTime	This feature is used to set the Exposure time (in microseconds).
ExposureTimeAbs	This feature is used to set the Exposure time (in microseconds).
ExposureTimeGranularity	Exposure time granularity.
ExposureTimeAbsMs	This feature is used to set the Exposure time (in milliseconds).
DarkTime	This feature is used to set the Dark time (in microseconds).
DarkTimeAbs	This feature is used to set the Dark time (in microseconds).
DarkTimeGranularity	Dark time granularity.
DarkTimeAbsMs	This feature is used to set the Dark time (in milliseconds).

Table 18: Camera standard feature: AcquisitionControl

AnalogControls

Feature	Description
Gain	This feature controls the selected gain as a raw integer value.

Table 19: Camera standard feature: AnalogControls

CameraSpecialFeatures

This feature is not available for Bigeye P-1100B/C Cool and Bigeye P-132B.

Feature	Description
CameraTemperatureState	Camera temperature state. 0 = The camera temperature is OK. 1 = The camera temperature is outside the optimum range.
CameraTemperatureStateReg	Camera temperature state register.
QueryCameraTemperatureState	Query camera temperature state.

Table 20: Camera special feature: Camera temperature

Index

A

AcquisitionControl..... 38, 44
AnalogControls 44

B

Binning 40
BinningHorizontal..... 43
BinningVertical..... 43

C

camera dimensions21, 23, 25, 27
camera interfaces 29
CameraSpecialFeatures 45
CameraTemperatureState 45
CameraTemperatureStateReg 45
CE..... 9
Conformity 9
Contacting 5
Control junction 29

D

declaration of conformity 9
DeviceInformation 42
document history 6

E

Exposure control 38
Exposure output.....29, 30, 31, 34
External GND 29, 30, 31
External Power 29, 30, 31

F

FCC Class B 9
Frame-sync output.....29, 30, 31, 36

G

Gain 41, 44
Gigabit Ethernet jack..... 37
GigE interface 37
GigE jack pin assignment..... 37

GigE Vision

feature description..... 42

I

ImageSizeControl 40, 43
I/O connector 29

L

Legal notice 2
Line-sync output29, 30, 31, 35

M

Mode input..... 32
Mode input (Pin 9)..... 39
Mode setting 39

P

Pin assignment
Gigabit Ethernet jack 37
PoE..... 10
Power supply 31

Q

QueryCameraTemperatureState 45

R

RJ-45 37
RoHS (2002/95/EC) 9

S

Specifications

Bigeye P-1100B/C Cool 16
Bigeye P-132B..... 10
Bigeye P-132B Cool 12
Bigeye P-629B Cool 14
Bigeye P-629B Solar Cool 14
specifications 10
Spectral Sensitivity
Bigeye P-629B Solar Cool 19, 20
Spectral sensitivity 18

Bigeye P-132B.....	18
Bigeye P-132B Cool	18
Bigeye P-132B Solar Cool	19
Bigeye P-629B Cool	19, 20
styles	7
Support	5
symbols.....	7

T

Technical information.....	5
Trigger input	29, 30, 31, 33
TriggerMode	39