



**CAM-CIC-3100-3-G-1/GC1;
GigE Large Area Scan Industrial Camera
User Manual**

**2023 August 18
V1.1.0**

Abstract

The document briefly describes GigE Large Area Scan Industrial Camera, including product introduction, networking, basic parameters and applications for quick operation.

Symbol Convention

The following symbols may appear in this document, and their meanings are as follows:

Symbol	Description
 Danger	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 Warning	Indicates a moderate or low level of potential danger which, if not avoided, could result in minor or moderate injury.
 Caution	Indicates a potential risk that, if ignored, could result in damage to device, loss of data, degraded performance, or unpredictable results.
 Tips	It can help you solve a problem or save you time.
 Instructions	Indicates additional information to the text, which is to emphasize or supplement.

Important Safety Instructions

Here is the proper use of the product and prevention of dangers as well as loss of property, etc. Be sure to follow the instructions when using.



Caution

- Please do not place or install the device in the location with strong sunlight or near the heat-generating equipment, make sure the cover temperature is controlled below 50°C.
- Please do not install the device in a humid place with dust or soot, please make sure the lens cover is locked if the camera is not connected to the lens, which is to avoid dust entering the camera.
- Please install the device in a stable location to avoid falling of the device.
- Please avoid water or other liquid dripping or splashing on the device and make sure there is no object full of liquid placed on the device, so to avoid liquid flowing into the device.
- Please install the device in a location with good ventilation, and do not block the ventilation opening of the device.
- Use the device only within the rated input and output range.
- Please do not dismantle the device at will.
- Please transport, use and store the device within the allowable range of humidity and temperature.

Special Announcement

- Please note that the manual is for reference only.
- The manual will be regularly updated according to the product update; the updated content will be added to the manual without prior announcement.
- The company is not liable for any loss caused by the operation which is not implemented according to the manual.
- There may be some technical deviation, errors which are not consistent with the product function and operation or misprint, please refer to the company's final explanation if there is any doubt or dispute.

Contents

Contents

Foreword	II
Important Safety Instructions	III
Directory	4
1 Product Overview	5
1.1 Product Introduction	5
1.2 Product Features	5
1.3 Typical Networking.....	6
1.4 Main Technical Parameters	6
1.5 Spectral Curve	8
1.6 Environmental Requirements.....	9
2 Interface Description	10
2.1 Product Dimensions	10
2.2 Interface Description.....	10
2.2.1 Network Interface	11
2.2.2 12pin Power and I/O Interface	11
2.3 Electrical Specification.....	11
2.3.1 Power Supply and Network Port Electrical Specifications.....	11
2.3.2 IO Port Electrical Specification	12
2.4 Indicator Light Description	13
3 FAQ	14
4 Cleaning and Maintenance	16

1 Product Overview

1.1 Product Introduction

GigE Large area scan camera adopts high-performance sensor chip and realizes real-time non-compressed image data transmission via GigE, which is compatible with any application development tool which meets GigE Vision and GenICam standard. Max transmission rate 1Gb/s can satisfy the requirements of transmission rate in most industrial applications. It can work in various harsh environments stably with high reliability and cost performance.

1.2 Product Features

Easy installation, convenient operation, support:

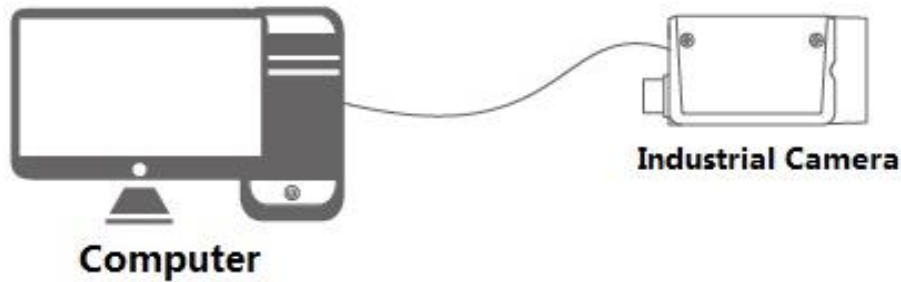
- Gigabit Ethernet interface, with a maximum transmission distance of 100m.
- A patented flatness mediation scheme to eliminate area defocusing.
- Excellent heat dissipation design, precise temperature control and constant temperature maintenance.
- Support Software Trigger/Hardware Trigger/Free Run Mode.
- Support user-defined ROI, horizontal mirroring and vertical mirroring.
- Support ISP functions including Auto Exposure/Auto Gain/Auto BlackLevel/Gamma Correction and LUT.
- Color cameras support automatic white balance.
- Support for FFC function to provide more uniform picture quality.
- Support fan speed adaptive function for setting the target temperature of the sensor.
- Conform to GigE Vision V2.0 protocol and GenICam standard.

1.3 Typical Networking

The most typical networking mode of a large area scan camera is point-to-point connection, which needs no other network medium between the host computer and industrial camera. It can be connected through cable, please refer to Figure 1-1.

A host computer can also connect multiple industrial cameras through multiple network ports or switches.

Figure 1-1 Typical Networking



1.4 Main Technical Parameters

Main technical parameters of the GigE Large Area Scan Industrial Camera are as follow:

Sheet 1-1 CAM-CIC-3100-3-G-1 Technical Parameters

31MP GigE Mono Large Area Scan Industrial Camera		
Sensor	Sensor Model	IMX342
	Sensor Type	CMOS
	Mono/Color	Mono
	Shutter	Global
	Resolution	6464 × 4852
	Pixel Size [μ m]	3.45 × 3.45
	Sensor Size	22.3 mm × 16.7 mm CMOS
	Bit Depth	12
	Frame Rate	3.6
Image	Dynamic Range	73dB
	Signal to Noise Ratio (SNR)	>40dB
	Gain	0dB~30dB
	Exposure Time	3 μ S~15S
	Image Format	Mono: Mono8/10/10p/12/12p;
Physical Interface	Data Interface	GigE
	IO Interface	3x Opto-isolated input, 3x Opto-isolated output, 1x RS232

31MP GigE Mono Large Area Scan Industrial Camera		
		interface
	Lens Mount	M58 x 0.75
Power/Weight Dimension/ Certification	Power Supply	DC 24V power supply via the 12-pin Hirose interface
	Power Consumption	24 V $\approx$ 7.86 W
	Temperature	Storage Temperature: -30 °C $\sim$ +80 °C ; Operating Temperature: -30°C $\sim$ +50°C
	Dimension	72mm $\times$ 72mm $\times$ 64mm(Not including the lens mount and the rear case connectors)
	Weight	487 g
	Certification	Conforms to CE, FCC, RoHS, GigE Vision V2.0 and GenICam
	Software	GenICam and GigE Vision supported devices

Sheet 1-2 CAM-CIC-3100-3-GC1 Technical Parameters

31MP GigE Color Large Area Scan Industrial Camera		
Sensor	Sensor Model	IMX342
	Sensor Type	CMOS
	Mono/Color	Color
	Shutter	Global
	Resolution	6464 $\times$ 4852
	Pixel Size [μ m]	3.45 $\times$ 3.45
	Sensor Size	22.3 mm $\times$ 16.7 mm CMOS
	Bit Depth	12
	Frame Rate	3.6
Image	Dynamic Range	73dB
	Signal to Noise Ratio (SNR)	>40dB
	Gain	0dB $\sim$ 30dB
	Exposure Time	3 μ S $\sim$ 15S
	Image Format	Color:Mono8,BayerRG8/10/10Packed/12/12Packed, BayerGB8/10/10Packed/12/12Packed
Physical Interface	Data Interface	GigE
	IO Interface	3x Opto-isolated input, 3x Opto-isolated output, 1x RS232 interface
	Lens Mount	M58 x 0.75
Power/Weight Dimension/ Certification	Power Supply	DC 24V power supply via the 12-pin Hirose interface
	Power Consumption	24 V $\approx$ 7.86 W

31MP GigE Color Large Area Scan Industrial Camera		
	Temperature	Storage Temperature: -30 °C ~ +80 °C ; Operating Temperature: -30°C~+50°C
	Dimension	72mm×72mm×64mm (Not including the lens mount and the rear case connectors)
	Weight	487 g
	Certification	Conforms to CE, FCC, RoHS, GigE Vision V2.0 and GenICam
	Software	GenICam and GigE Vision supported devices

1.5 Spectral Curve

The following spectral curve data are derived from the manual of the selected chip.

Figure 1-2 IMX342 Mono Spectral Response

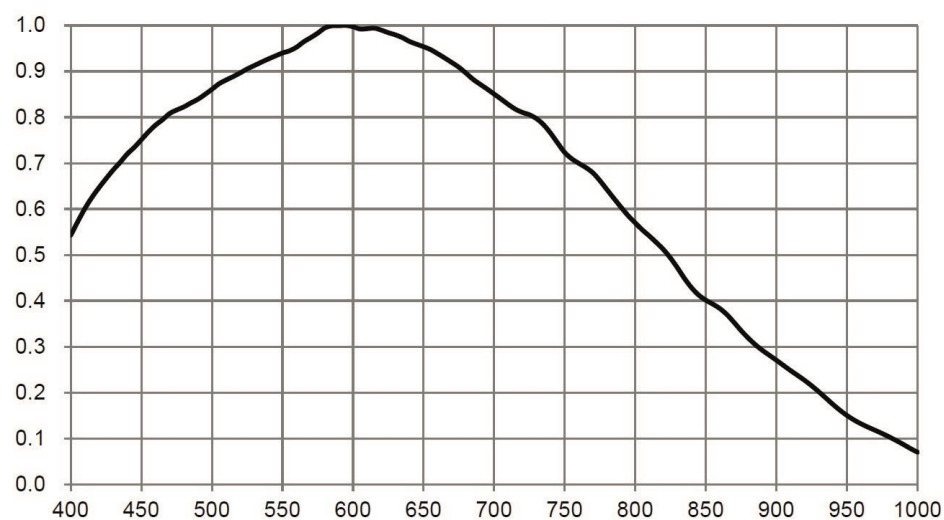
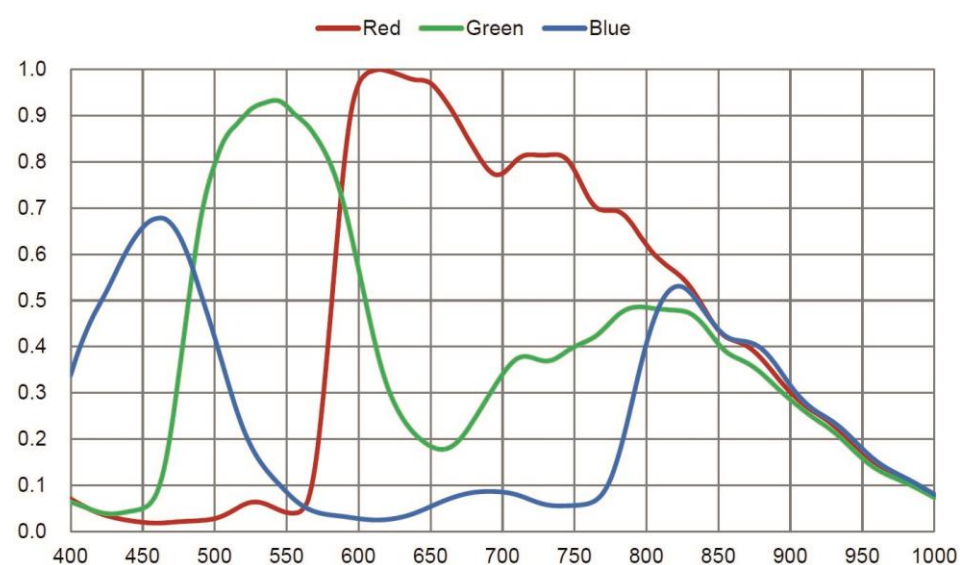


Figure 1-3 IMX342 Color Spectral Response



1.6 Environmental Requirements

The following are the environmental requirements for GigE large area scan industrial camera:

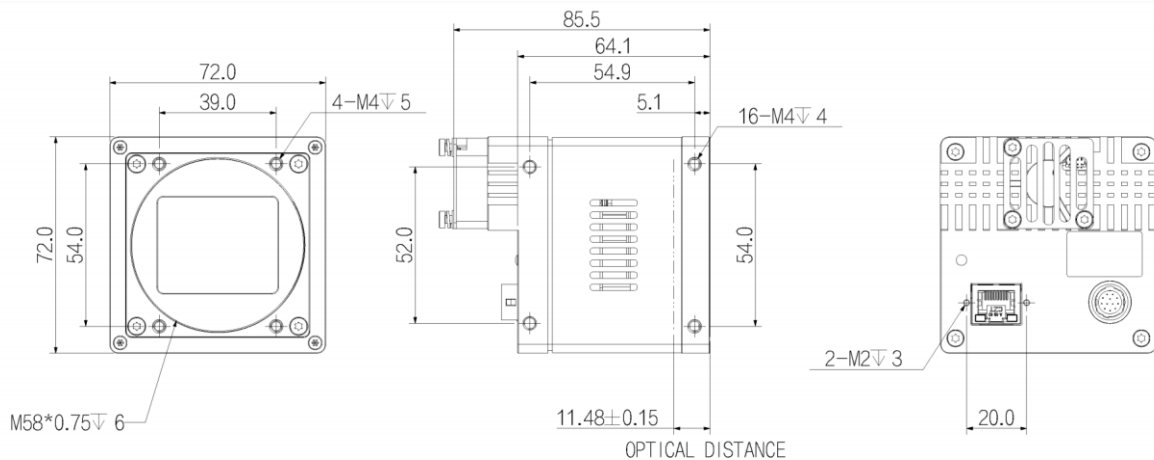
- Temperature and humidity
Ambient temperature should not exceed 50 °C, it is best to work in an air-conditioned environment.
 - ◇ Operating cover temperature: 0°C~50°C.
 - ◇ Operating ambient humidity: 20%~80% no condensation.
 - ◇ Storage temperature: -30°C~+80°C.
 - ◇ Storage humidity: 20%~80% no condensation.
- Please install the device in a stable location indoors, with enough heat dissipation space.
- Please keep certain ventilation.

2 Interface Description

2.1 Product Dimensions

The product dimensions are as follows:

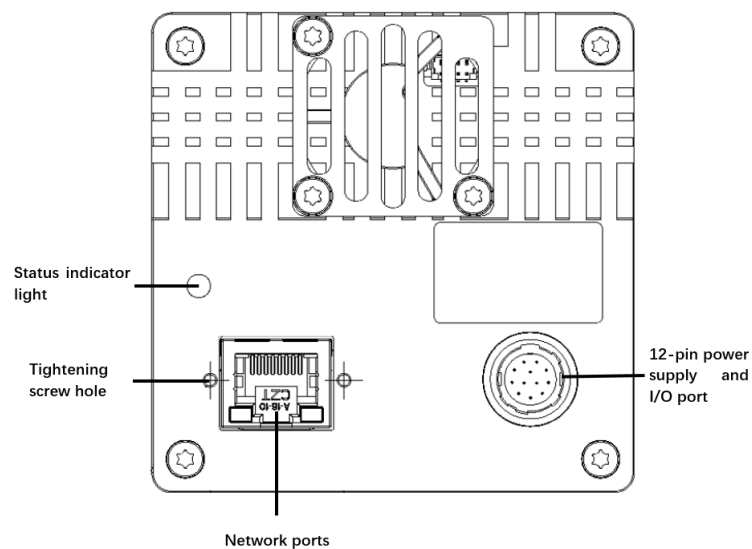
Figure 2-1 CAM-CIC-3100-3-GC1/ CAM-CIC-3100-3-G-1 (Unit: mm)



2.2 Interface Description

The back of the device has two interfaces, the network interface and 12pin power as well as I/O interface, as shown below:

Figure 2-2 CAM-CIC-3100-3-GC1/ CAM-CIC-3100-3-G-1 Interface Description



2.2.1 Network Interface

Network interface, RJ45 Ethernet port, three-speed Ethernet 10M / 100M / 1000Mbps transmission interface for camera control, data transmission.

It is best to use shielded twisted-pair Category 6 cable in order to ensure the transmission quality, as well as to prevent too much data retransmission and packet loss phenomenon.

2.2.2 12pin Power and I/O Interface

Sheet 2-1 lists the pin signal definition of the I/O interface.

Sheet 2-1 Pin Signal Definition

Pin	Signal	Description
1	-	Camera power ground and RS232 signal ground
2	-	+9VDC ~ +24 VDC camera power supply
3	RXD RS232	Serial port receive
4	TXD RS232	Serial port transmit
5	Line3	Opto-isolated input
6	Line4	Opto-isolated input
7	Line5	Opto-isolated input
8	OPT_IN_GND	Opto-isolated input ground,not to connect to the power GND
9	Line0	Opto-isolated output
10	Line1	Opto-isolated output
11	Line2	Opto-isolated output
12	OPT_OUT_GND	Opto-isolated output ground,not to connect to the power GND

2.3 Electrical Specification

2.3.1 Power Supply and Network Port Electrical Specifications

Sheet 2-2 Power Supply and Network Port Electrical Specifications

Parameter	Description
Power specification	+9 VDC to +24 VDC, <1% ripple, power supply by the Hirose 12-pin connector of the camera*; 26 AWG cables or better.
EMS Standard	ESD (GBT17626.2/IEC61000-4-2): Metal housing contact 6 kV

	Surge (IEC61000-4-5): Ethernet port: 2 kV common mode, 1 kV differential mode (100/700 μ s) Power port: 2 kV common mode (1.2/50 μ s)
EMC Standard	Class B

*: The power supply should meet SELV and LPS specifications.

2.3.2 IO Port Electrical Specification

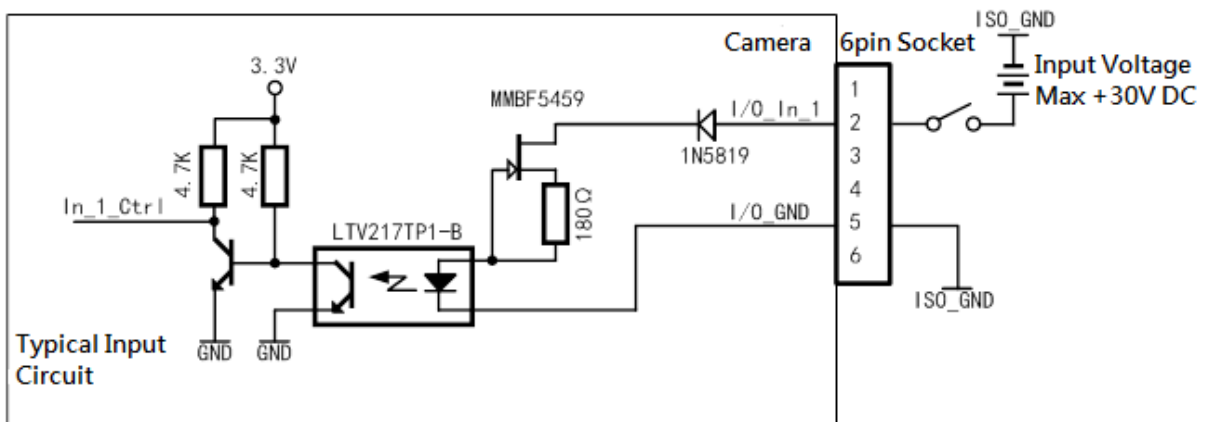
2.3.2.1 Opto-isolated Input

Sheet 2-3 Opto-isolated input

Input Voltage	Description
DC 30V	Limit voltage: input voltage should not exceed this limit, otherwise it will cause damage to the device
DC 0~24V	I/O input safe operating voltage range
DC 0~1.4V	Indicates logical 0
DC >1.4V~2.2V	Input state reverses and logic state is not certain
DC >2.2V	Indicates logical 1

Sink current of Opto-isolated input: 5 mA to 15 mA.

Figure 2-3 Opto-isolated Input Circuit



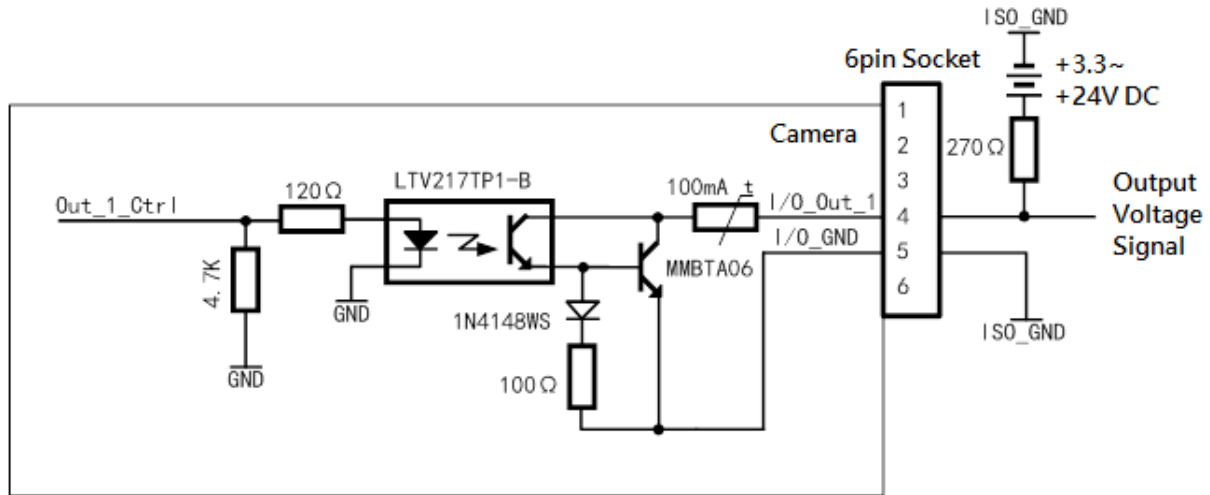
2.3.2.2 Opto-isolated Output

Sheet 2-4 Opto-isolated Output

Output Voltage	Description
+30.0VDC	Limit voltage, which must be not exceeded; otherwise, the equipment may be damaged.
<+3.3VDC	I/O output may be incorrect
+3.3~+24VDC	Safe operating voltage output range

The max continuous current of isolated I/O output is 50mA.

Figure 2-4 Opto-isolated Output Circuit



Typical Voltage Output Circuit

2.4 Indicator Light Description

The indicator light description of the device is shown in Sheet 2-.

Sheet 2-5 Indicator Light Description

Status	Indicator light status		Note
Normal	Red	Red light quick flashing	Device booting.
	Blue	Blue light slight brightness	IP is assigned, and the application software API is not connected to the device.
		Blue light high brightness	The application software API is connected to the device, free mode, no image transmission.
		Blue light quick flashing	The application software API is connected to the device, free mode, with image transmission.
		Blue light slow flashing	Use trigger mode.
	Red and Blue	Red and blue light alternate flashing	Firmware upgrading.
Abnormal	Red	Red light normally on	Device abnormality: such as no stream, firmware upgrade failure etc.
		Red light slow flashing	Network disconnected.

3 FAQ

You can solve problems that you may encounter with following instructions:

1. Application fails to discover the device.

Reason analysis:

- The camera fails to boot up normally.
- Connection of network cable is abnormal.
- The camera and the Host PC running the client are not in the same LAN.

Solutions:

Reboot the camera, check if cable connection is correct or the indicator light is normal. Add device to the same LAN of the host PC running the client.

2. Application can discover the camera, but connection failed.

Reason analysis:

- The camera fails to boot up normally.
- The device IP is not added to the same network segment of the host PC.
- Another client has been connected to the camera.

Solutions:

Reboot the camera; change camera IP address to the same network segment of the host PC; or disconnect the camera from the other client and connect it to this client.

3. The preview interface is all black in the application.

Reason analysis:

- Lens aperture is blocked.
- Camera runs abnormally.

Solutions:

Open lens aperture, power off and reboot the camera device.

4. It fails to enable external trigger.

Reason analysis:

- External trigger connection is wrong.
- It fails to select external trigger in trigger mode.

Solutions:

Select correct trigger mode and make sure external connection is correct.

4 Cleaning and Maintenance

This chapter mainly introduces cleaning and replacement of color filter.

We have installed a fully transparent protective glass for the mono camera with the main purpose of preventing dust from falling on the surface of the image sensor. The color camera is equipped with a low-pass filter that cuts off to the near-infrared band. If you have special requirements, such as not using a color filter or using another light-transmitting filter, you can replace the entire filter mount of the image sensor (no need of removing the cover).

If the surface of the filter needs to be cleaned, we recommend using the special cleaning agent for optical devices that can clean the surface without leaving a mark.