OPT®

Machine Vision

L1 Series 10 Gigabit Port Industrial Line Scan Camera Specifications

V2. 1. 0

Preface

Overview

This article briefly describes the content of the 10 Gigabit Ethernet port Line Scan industrial camera, including product introduction, networking, basic parameters and quick operation of the application software.

Symbol Conventions

The following symbols may appear in this document, and the meanings they represent are listed below:

Markings	Explain
	Represents a high potential danger and, if not avoided, can lead to casualties or serious injury.
	Represents a moderate or low potential hazard that, if not avoided.
	Indicates a potential risk, potentially to device damage, data loss, reduced device performance, or unpredictable results.
	Represents electrostatically sensitive devices.
	Represents a high-pressure danger.
	Represent the intense laser radiation.
	To a dangerous moving parts, stay away from the moving fan blades.
	It means the mechanical injury of the equipment parts.
	Can help you solve a problem or save your time.
	The presentation is additional information to the text, an emphasis and supplement to the text.

Notes on safe use

警告

- During the installation of products and use, the electrical safety regulations of the country and the region must be strictly observed.
- Please use the power adapter provided by the regular manufacturer. For the specific requirements, please refer to the power adapter parameters.
- To reduce the risk of fire or electric shock, do not let the product get rain or damp.
- Easy-to-use power-off equipment should be included in the building installation assembly line.
- When installed in a operating environment, make sure the product is secured.
- If the product is not working properly, please contact the nearest service center and do not remove or modify the product in any way.
- (The Company shall not be liable for problems caused by unapproved modifications or repairs).

注意

- Avoid installing the product in a vibration or impact environment and keep the product away from electromagnetic interference.(Ignoring this item may damage the product).
- Do not touch the heat dissipation parts of the product directly to avoid scalding.
- Do not install indoor products in an environment that may drench with water or other fluids.
- Do not use the product in extremely hot, extremely cold, dusty, corrosive or high humidity environment. See the specific temperature and humidity requirements.
- Avoid focusing the lens on bright light (such as lighting, sunlight or laser beam, etc.), which can damage the image sensor.
- Do not touch the image sensor directly. If necessary to clean, slightly moisten the soft clean cloth with alcohol and gently wipe the dust. When the product is not used, add the dust cover to protect the image sensor.
- Please keep all the original packaging materials of the camera properly, so that if there is a problem, package the camera with the packaging materials, and send it to the agent or return to the manufacturer for processing. The Company shall not be liable for accidental damage during transportation caused by the original packaging materials.

说明

Quality requirements for the installation and maintenance personnel:

- Have the qualification certificate or experience in the installation and maintenance of weak current system, and have the experience and qualification in the relevant work, in addition to must have the following knowledge and operation skills.
- Basic knowledge and operation skills of low voltage wiring and low voltage electronic line wiring.
- The ability to read the contents of this manual.

CONTENS

Chapter1 Product overview

1. 1. Product presentation

The 10 Gigabit Ethernet Line Scan Industrial Camera is a highly reliable and cost-effective line scan industrial camera. It adopts high-performance sensor chip, transmits uncompressed image data in real time via 10Gb Ethernet, and is compatible with any application development tools conforming to GigE Vision and GenICam standards. The maximum transmission rate of 10Gb/s can satisfy the requirements of most industrial applications, and it can work stably in a variety of harsh environments.

Graph1-1 Appearance

1. 2. Product characteristics

- The 10 Gigabit Ethernet interface has a maximum transmission distance of up to 100m.
- Support software trigger/hardware trigger/hybrid trigger/free acquisition and other modes.
- Supports ISP functions such as gamma correction, lookup table, black level correction, brightness, contrast, etc.
- Color camera supports interpolation, white balance, color conversion matrix, hue, saturation and so on.
- Support multiple image data format output, ROI, mirroring and so on.
- Comply with GigE Vision 2.0 protocol and GenICam standard.
- Support DC 12V~24V voltage supply.
- Compliant with EMC, RoHS certification.

1. 3. Typical networking

The most typical networking mode of industrial camera is point-to-point connection, that is, the host machine and the industrial camera do not need other network media, through the network cable.

A single host machine can also be connected to multiple industrial cameras through multiple network ports or switches, as shown in the figure below.

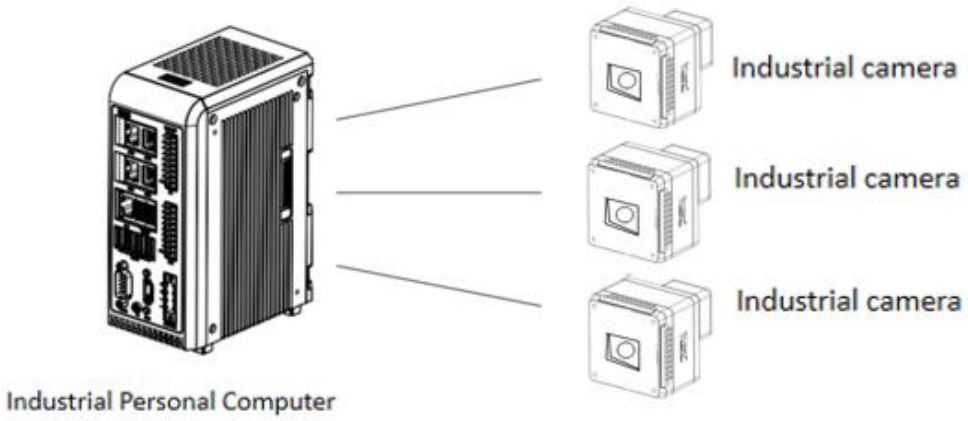


Fig. 1-2 Typical networking mode

1. 4. Environmental requirements

The environmental requirements for 10 Gigabit Ethernet Line Scan industrial cameras are as follows:

- Temperature and humidity
  The ambient temperature should not exceed 50℃, and it is best to work in an air-conditioned environment.
  - ◇ Housing temperature during operation: 0℃ ~60℃.
  - ◇ Ambient humidity: 20%~80% without exposed.
  - ◇ Storage temperature: -30℃ ~ + 80℃.
  - ◇ Storage humidity: 20%~80% non-exposed.
- The equipment is installed indoors, in a stable position, and the front and back with enough heat dissipation space.
- Ensure a certain flow of air.

Chapter2 Interface description

2.1. Camera structure size

The structure size of the product is as follows: Type 1: including OPT-CL1-M4-XG 3-01

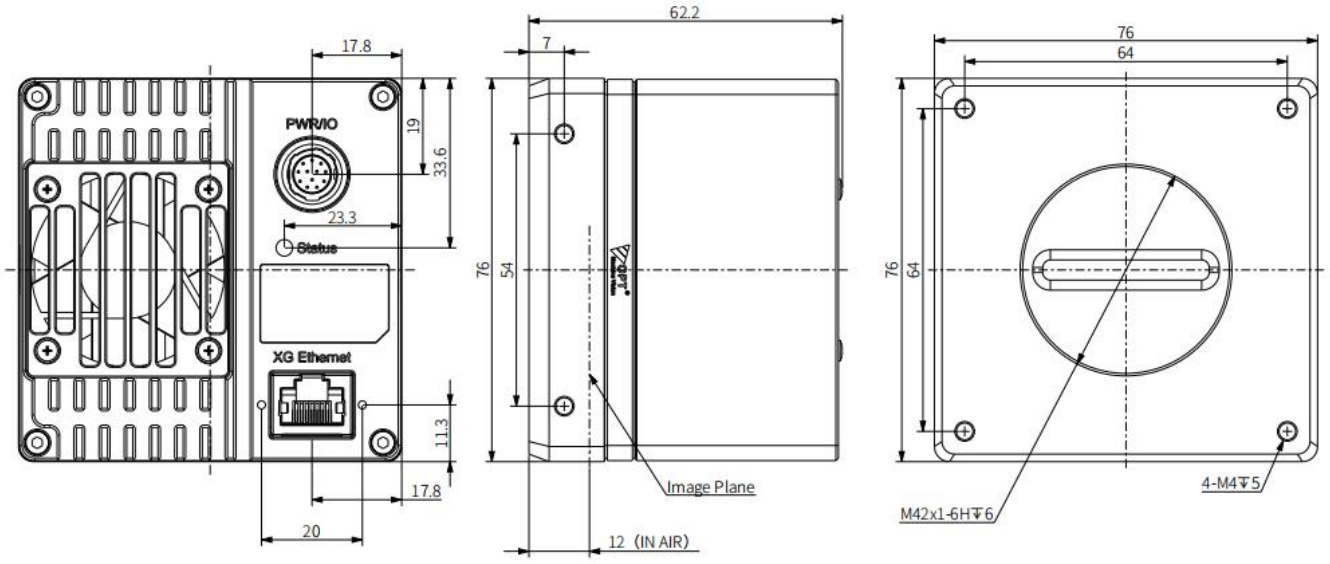


Figure 2-1 Dimensional drawing of Line Scan camera with 10 Gigabit ports

Type 2: including OPT-CL1-M8-XG 3-01, OPT-CL1-M16-XG 3-01

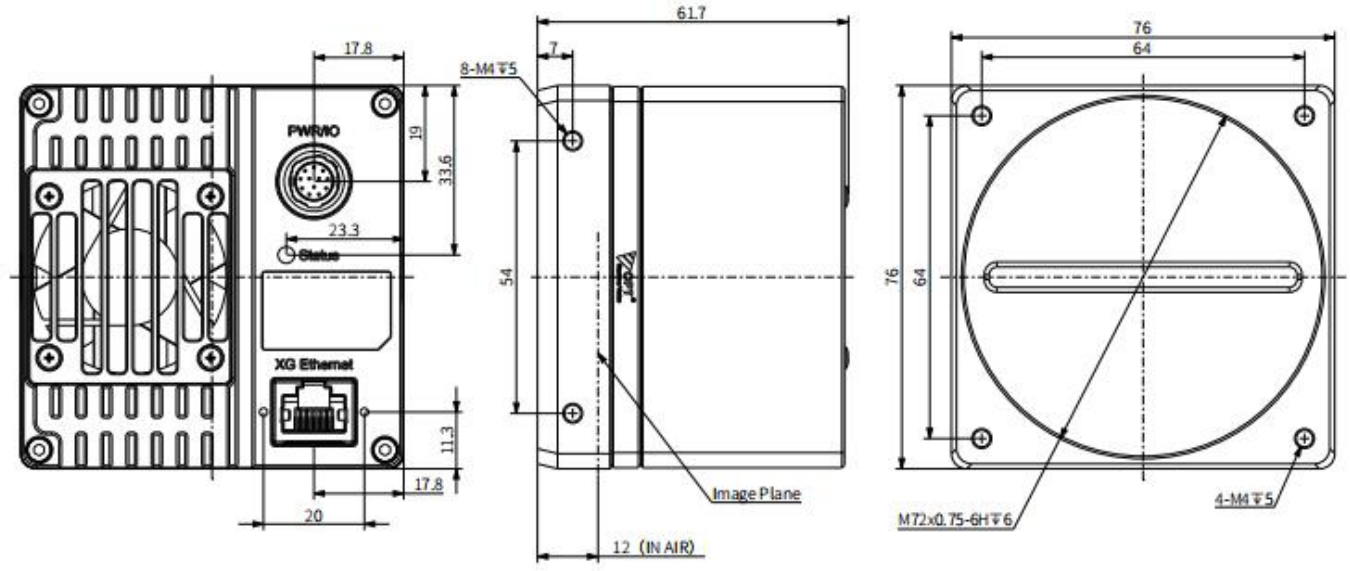


Figure 2-1 Dimensional drawing of Line Scan camera with 10 Gigabit ports

2.2. Interface specification

There are two interfaces on the back of the device, network interface, 12pin power supply and I / 0 interface, as shown in the figure below:

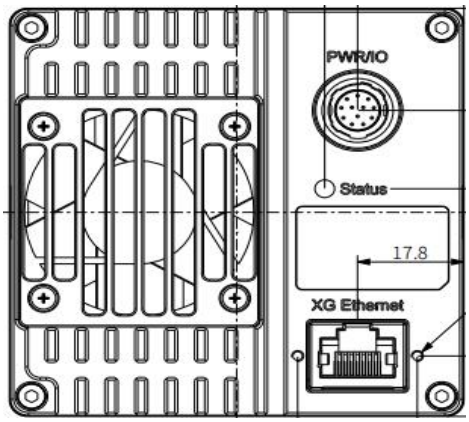


Figure 2-2 Dimensional Drawing of 10 Gigabit Port Line Array Camera

2.3. Network interface

Network interface, namely RJ 45 network port, Ethernet 10000Mbps transmission interface, used for camera control, data transmission.

In order to ensure the transmission quality, the network cable had better use the shielding super 6 twisted pair cable to prevent excessive data retransmission and packet loss.

2.4. 12 PIN power supply and I / 0 interface

The pin signal of the I / 0 interface is defined as followsTable 2-1As shown.

outside2-1Definition of pipe foot signal

pin	signal	explain
1	GND	Power to
2	PWR	The DC 12V and ~ 24 V camera power supply
3	IN Line1+	Encoder input Encoder A +
4	IN Line1-	Encoder input to Encoder A-
5	IN Line2+	Encoder input Encoder B +
6	IN Line2-	Encoder input to Encoder B-
7	OUT GND	Optically coupled isolated output ground
8	OUT Line5	Optically coupled isolation output Line Out1
9	OUT Line6	Optically coupled isolation output Line Out2
10	IN G ND	Optically coupled isolated input ground
11	IN Line4	Optically coupled-isolated input to Line2
12	IN Line3	Optically coupled-isolated input to Line1

12 Pin parent pin position sorting and wiring definition (wiring definition and I / O interface correspondence) are as follows:

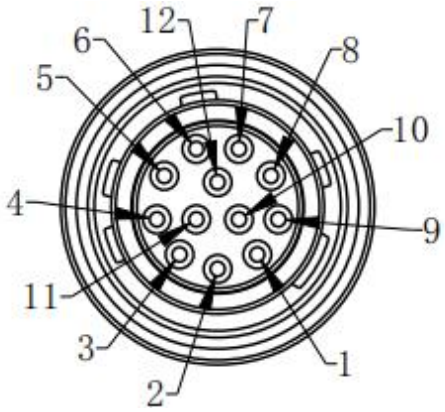


Figure 2-3 12pin pin placement

outside2-2 12pin female plug pin wiring definition

pin	signal	Line color
1	GND	black
2	PWR	red
3	IN Line1+	White Orange
4	IN Line1-	Orange
5	IN Line2-	Green
6	IN Line2+	White green
7	OUT GND	white
8	OUT Line5	White Brown
9	OUT Line6	Brown
10	IN G ND	Grey
11	IN Line4	blue
12	IN Line3	White blue

2.4.Electrical specifications

2.4.1. Electrical specification of power supply and network ports

outside2-3 Electrical specifications of the power supply and the network port

parameter	explain
Camera power specifications	DC + 12V~ + 24V, <1% ripple, powered by the camera 12-core Hirose connector; A minimum of 26 AWG cables is required.
EMI standard	Radiation Interference (Radiation) QP：30-230MHz，40dBuV/m@10m； 230-1000MHz，47dBuV/m@10m； Conducting interference (Conduction) 0.15-0.5MHz，79dBuV-QP；66dBuV-AV； 0.5-30MHz，73dBuV-QP；60dBuV-AV；

EMS standard	Electrostatic immunity (ESD) contact discharge: ± 4kV air discharge: ± 8kV Electric fast-changing pulse group (EFT) ± 2kV Surge immunity (Surge) ± 2kV Conductance immunity (Conducted Susceptibility) 0.15-80MHz，10V，80% AM(1KHz) Radiation immunity (Radiated Susceptibility) 80-1000MHz，10V/m； 1.4-2.0GHz，3V/m； 2.0-2.7GHz，1V/m；
EMC standard	Class A

说明

- Support for DC + 12V~ + 24V external power supply.
- The power supply must meet the SELV and LPS specifications.

2.4.2. Electrical specification of the IO interface

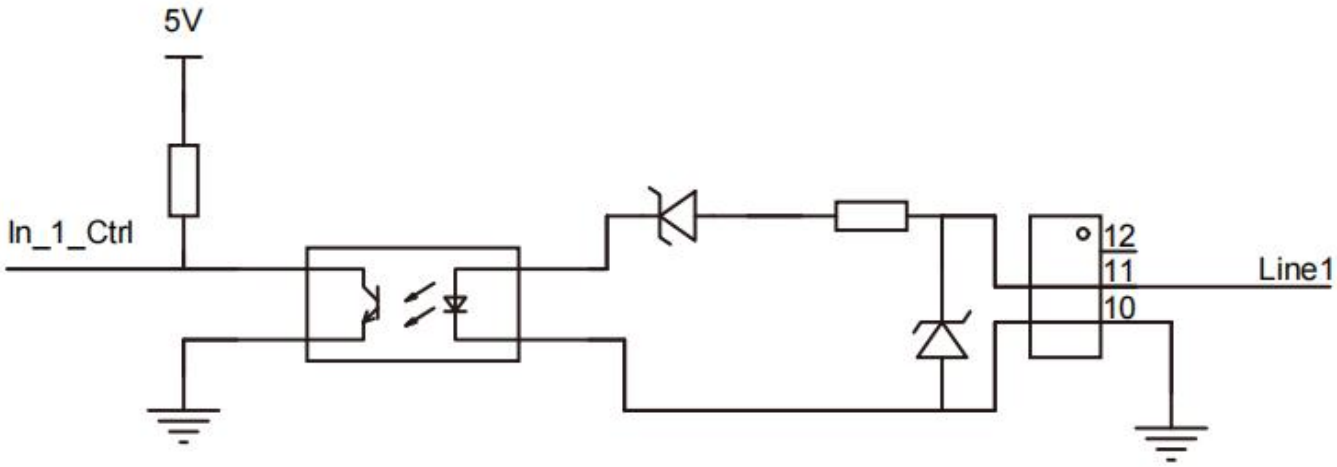
2.4.2.1. Light-coupled isolation input

Outside2-4 Optically coupled isolated input

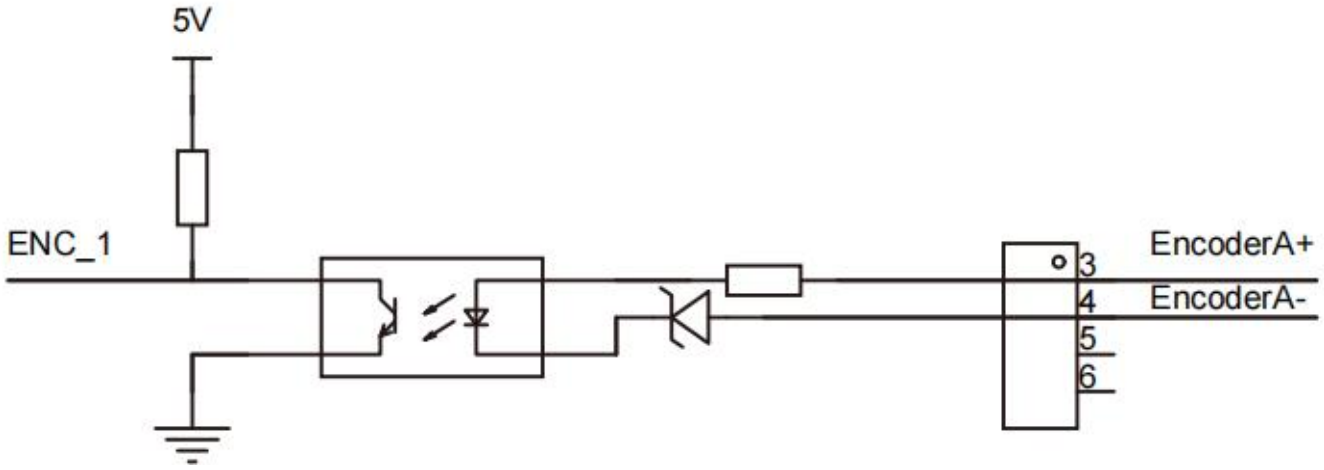
input voltage	description
30V	Limit voltage, the input must not exceed this limit value, otherwise it will cause equipment damage
DC 0～24V	I / O input safe operating voltage range
DC 0～1.4V	Represents logical 0
DC >1.4V～2.2V	The input state is flipped in this area and the logic state is variable in this voltage range
DC >2.2V	Represents logical 1

注意

Isolation of the I / O input port infusion current from 5 mA to 15 mA.



Graph2-4 Frames trigger the optical coupling isolation input circuit diagram



Graph2-5 Circuit diagram of encoder

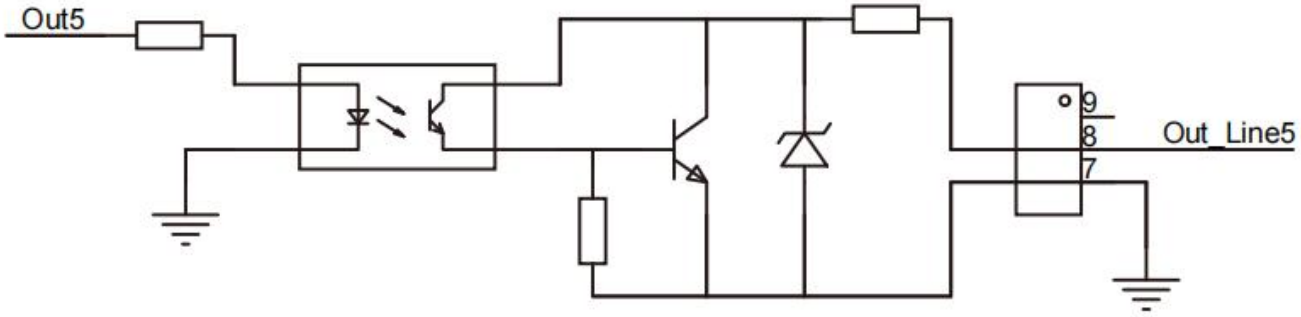
2.4.2.2. Optical coupling isolation output

outside2-5 Optical coupling isolation output

voltage	description
DC 30V	Limit voltage, the input must not exceed this limit value, otherwise it will cause equipment damage
DC ＜3.3V	The I / O output may be wrong
DC 3.3V～+24V	I / O output safe working range

注意

Isolation I / O output passes up to 50 mA.

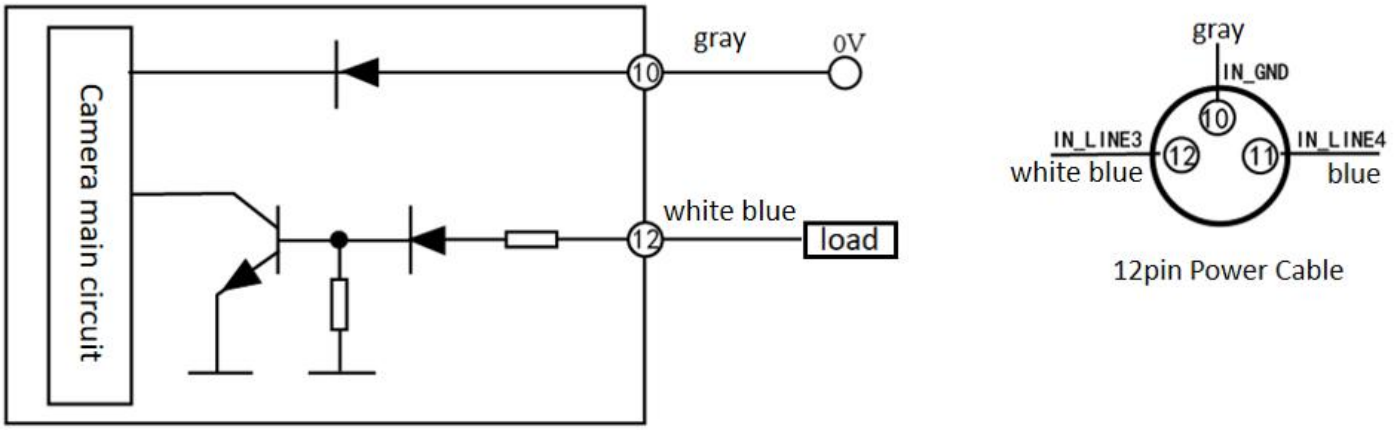


Graph2-6 Optical coupling isolation output circuit diagram

2.5. Camera wiring diagram

2.5.1. Frame trigger optical coupling isolation input

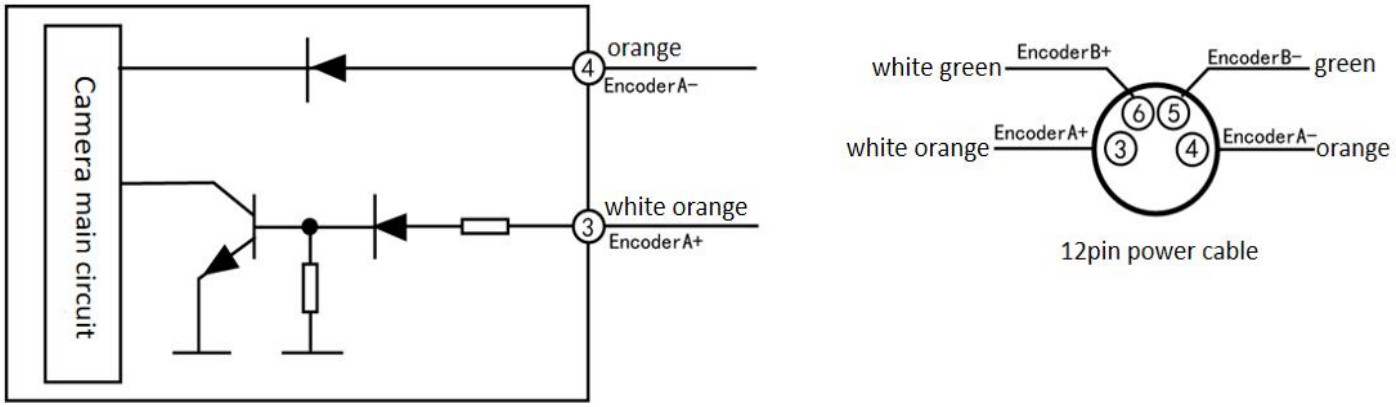
The input of the camera is connected to the optical coupling isolation output of the loaded frame signal



graph2-7 frames trigger the optical coupling isolation input wiring diagram

2.5.2. The encoder triggers the optical coupling isolation input

The encoder input of the camera is connected to the photocoupled isolation output of the loaded encoder signal



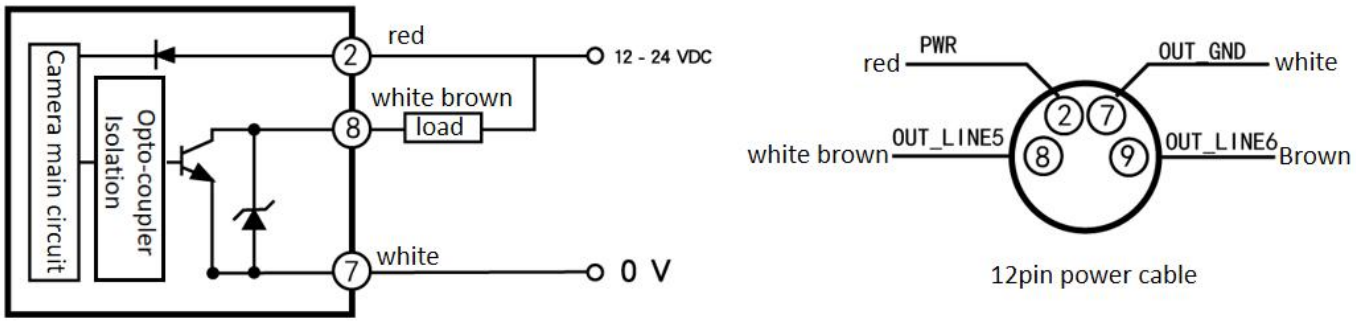
Graph2-8 The encoder triggers the optical coupling for isolating the input wiring diagram

2.5.3. Optical coupling isolation output

The optical coupling isolation output signal of the camera is connected with the input of the load, and the connection mode is divided into NPN load and PNP load.

NPN

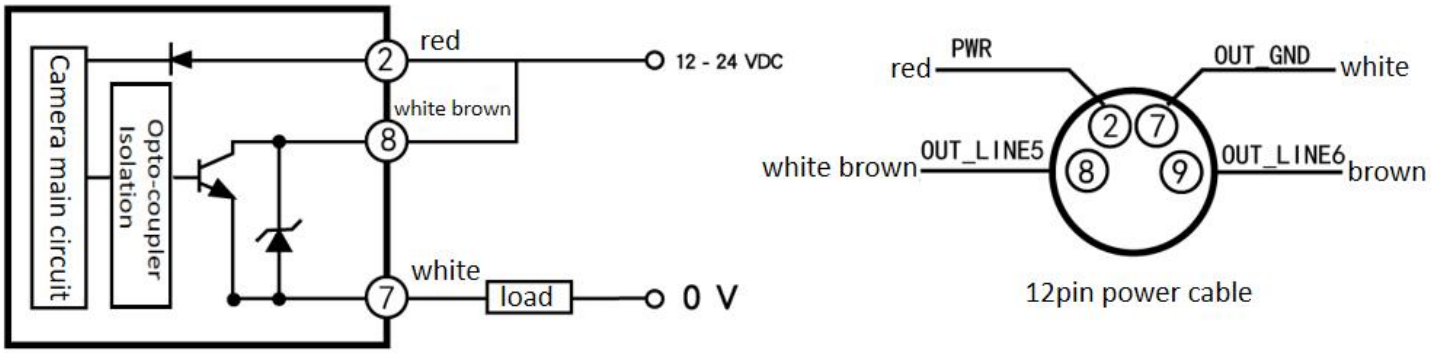
Output Circuit Wiring Diagram



Graph2-9 Optical coupling isolation output load NPN wiring diagram

PNP

Output Circuit Wiring Diagram



Graph2-10 Optical coupling isolation output load PNP wiring diagram

2.6. Status indicator light

The status indicator light description of the equipment is shown in Table 2-8.

Table 2-8 indicator instructions

● Color and status	● diagram matic sketch	● explain
Close		The equipment is not powered
Orange lamp		System start
Green flash flash for at least 1 second		Link detection is in progress
The green light flash slowly		The device and the host have been connected and wait for the camera or camera to wait for drawing
Orange lights flash slowly		The device is in the acquisition trigger mode, waiting for the trigger
The orange and green lights flicker		The device is in the trigger acquisition mode and the camera receives the trigger acceptance to capture the image
The green light is always bright		The device is in free acquisition mode, collecting images

Chapter3 Product installation

Installation is mainly divided into hardware installation and application installation.

3.1. Hardware installation

Before installation, please check the equipment for obvious damage and confirm whether it is consistent with the supporting list.

1. Attach the camera to the mounting position and select the appropriate lens to mount to the camera.
2. Connect the camera to a 10 Gigabit LAN card using a Super Category 6 cable (we recommend using our recommended 10 Gigabit LAN card).
3. Select any of the following power supply modes.

Direct power supply: use 12-pin power supply I / O cable to the appropriate power adapter according to the correct wiring method, see the I / O interface definition1.4Definition of power supply and I / O interfacechapters and sections。

12V power adapter power supply: use the 12 PIN power line provided by the company, which is a 2-pin power line and the adapter information.

3.2. Application installation

The host takes the following steps to install the application:

说明

Contact the relevant technical support personnel for the application installation package.

1. Open the software, double-click the desktop shortcut, and open the application installation package. 

2. If the driver has been installed before, it will pop up in Figure 3-1 window, confirm whether to automatically uninstall and reinstall as required, and if click Yes, start to uninstall.

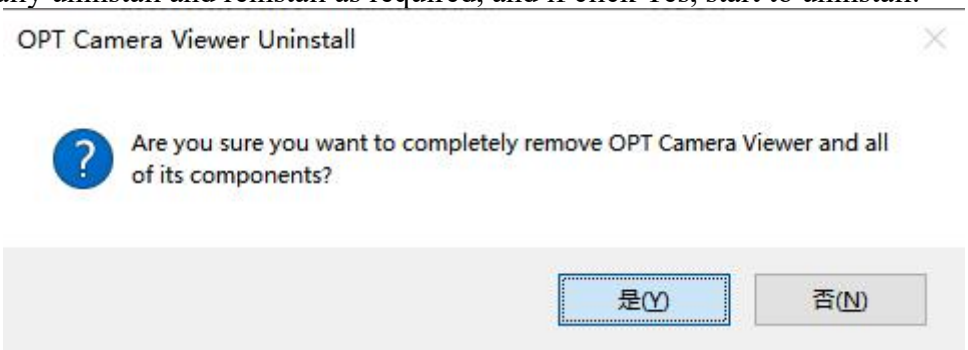


Figure 3-1 Prepare the unloading window

3. Enter the unloading installation window as shown in Figure 3-2, waiting for uninstall (if the driver has not been installed before, steps 2 and 3 are required)

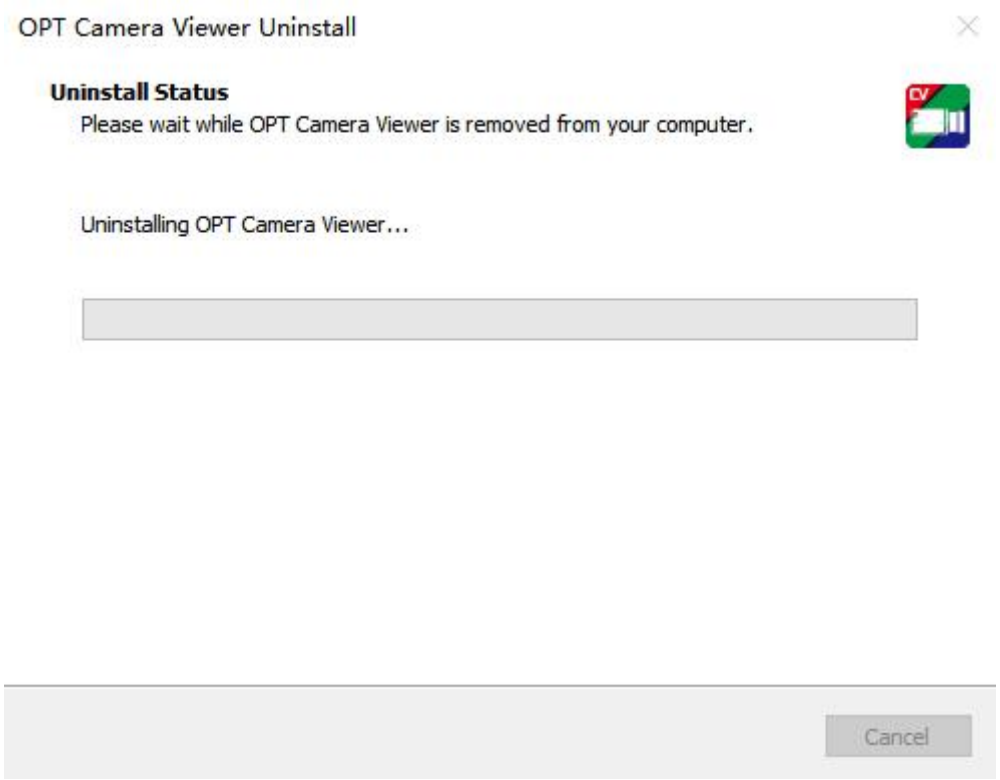


Figure 3-2, Unloading window

4. After the uninstallation is completed, directly enter the installation process, and the license agreement window will pop up as shown in Figure 3-3. After carefully reading the license agreement, confirm the agreed license terms, and then click the next button to continue the installation process.

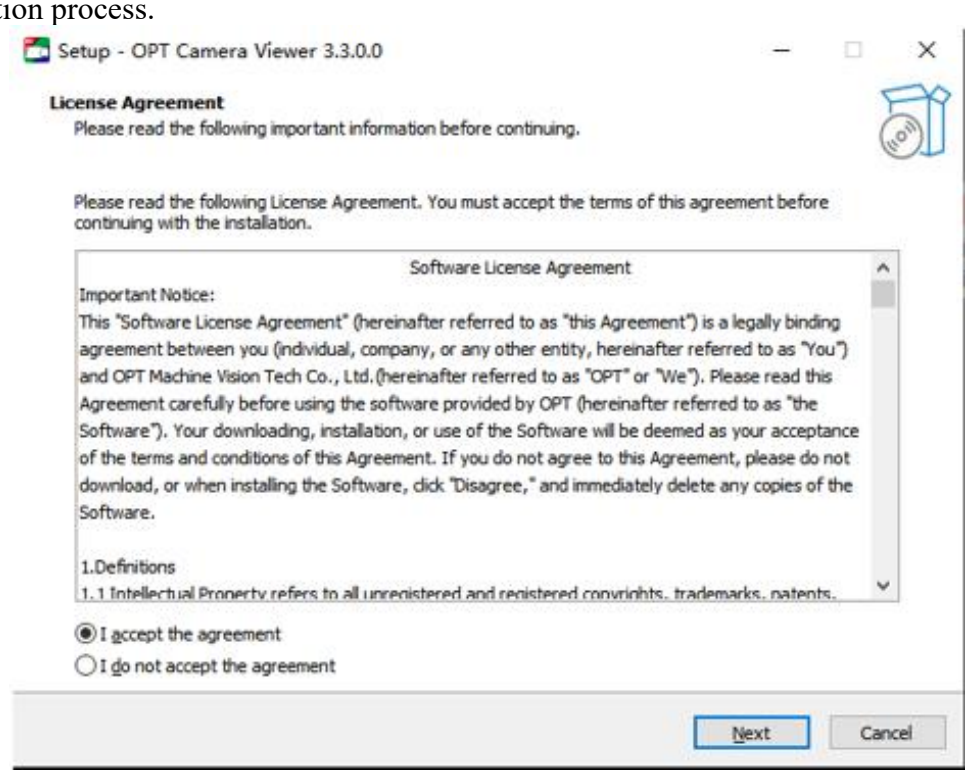


Figure 3-3 Prepare the installation window

5. Enter the installation folder window as shown in Figure 3-4, select the software installation path

(default path: C: \ Program Files \ OPT \ OPTCameraViewer Demo) and click the next button to continue the installation process.

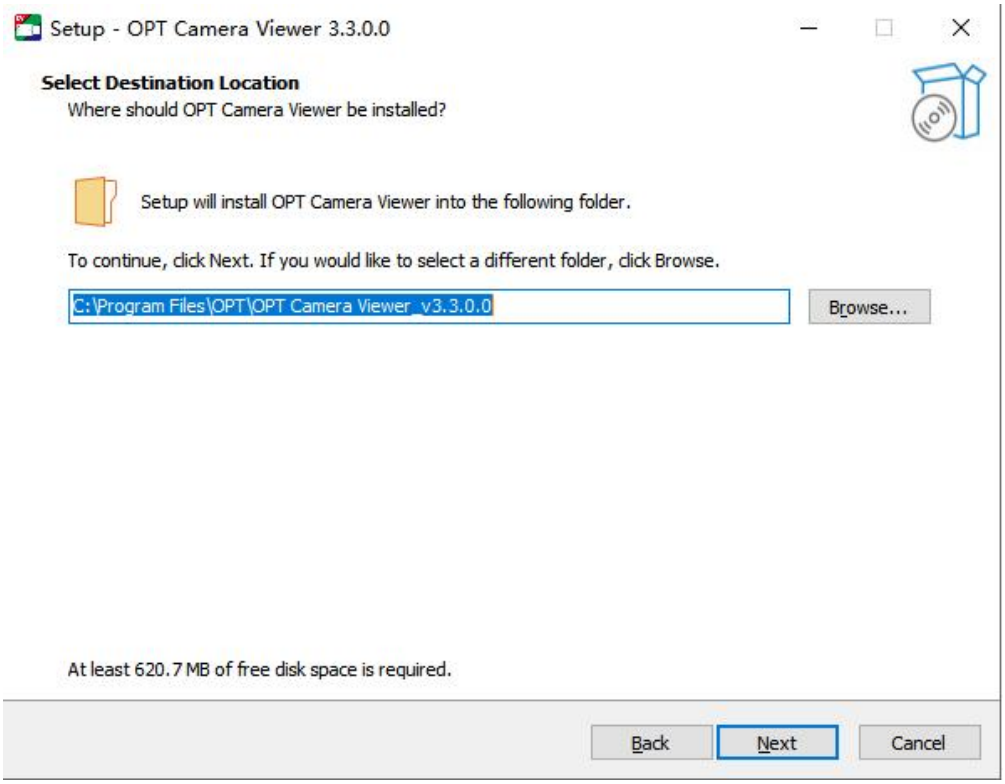


Figure 3-4 Installation folder window

6. Enter the preparation for installation window as shown in Figure 3-5, check the installation summary information and click the next button to continue the installation process.

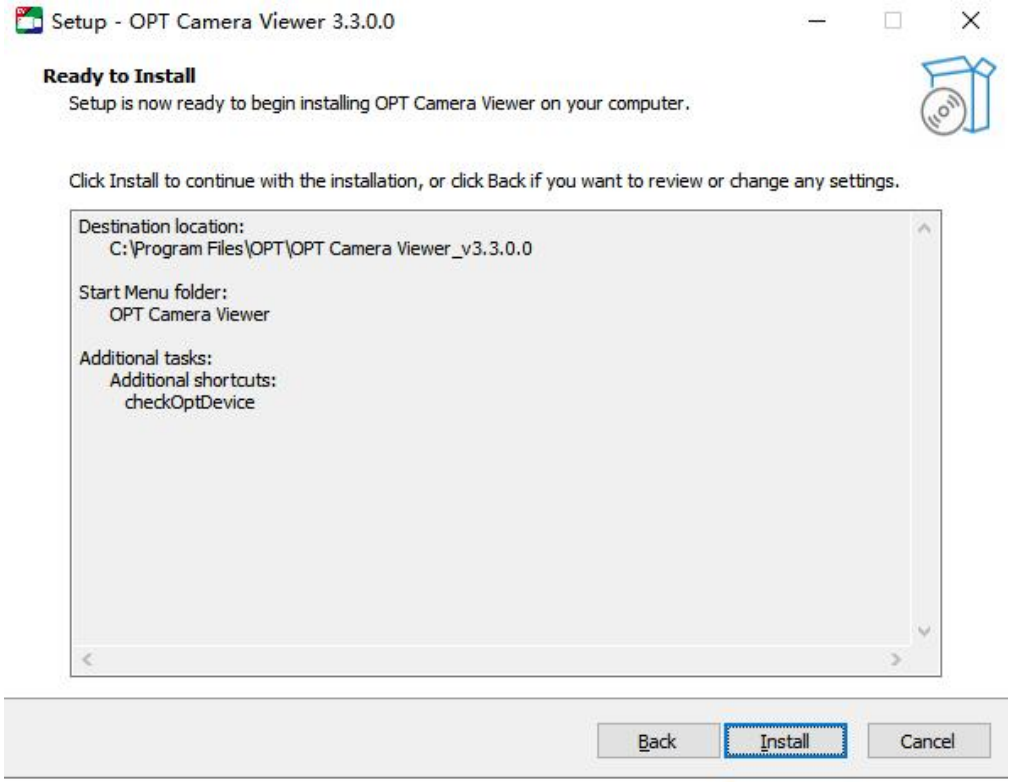


Figure 3-5 Prepare the installation window

7. Enter the installation window as shown in Figure 3-6 and wait for installation.

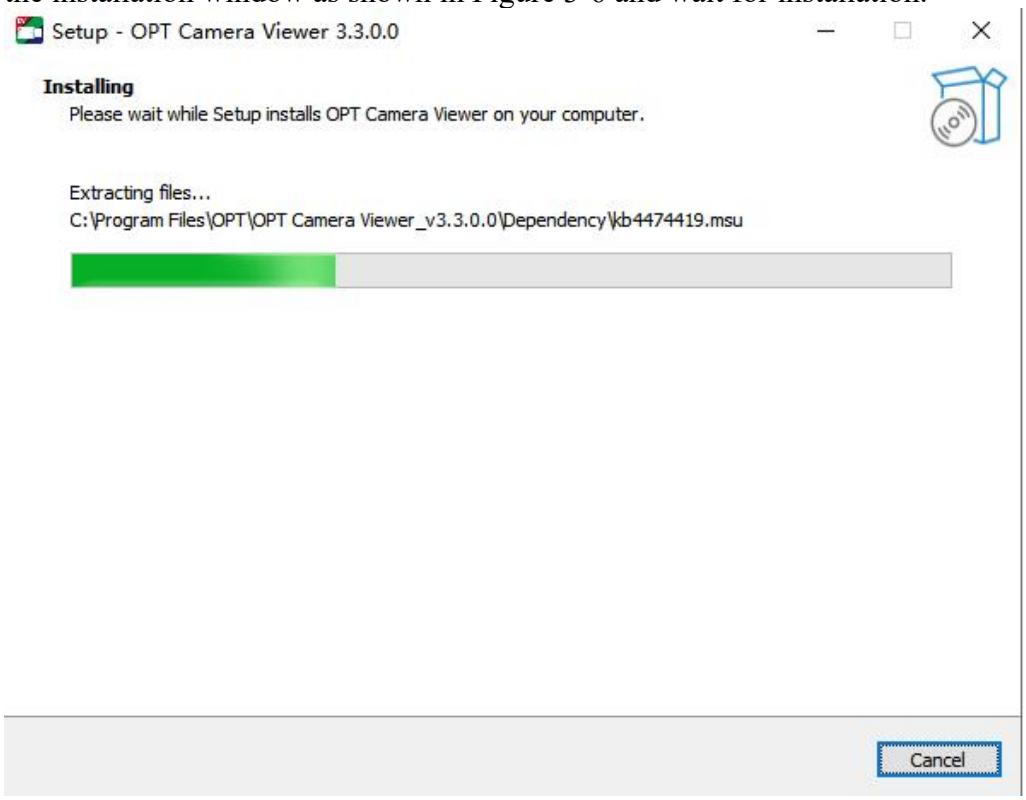


Figure 3-6, showing the installation window

8.The software installation success window is shown in Figure 3-7. The software OPT Camera Viewer is installed successfully, click the complete button to end the installation process.

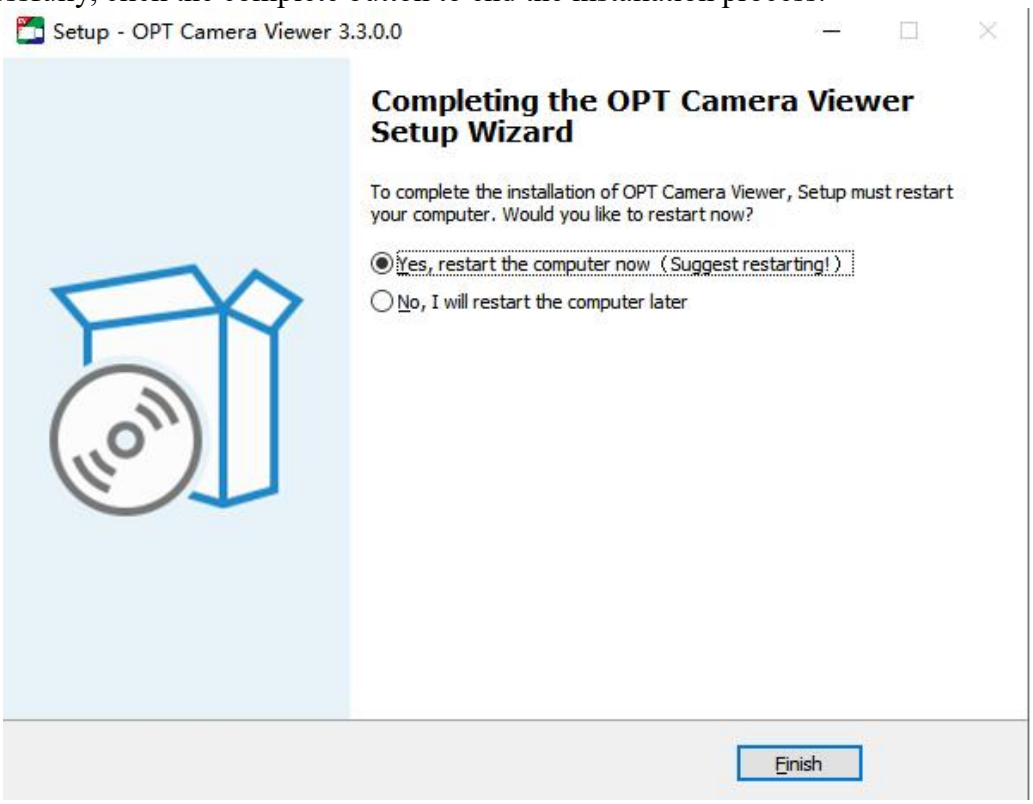


Figure 3-7 Windows for software installation success

Chapter4 Network settings

注意

- Make sure the 10Gb Ethernet line matrix industrial camera is correctly wired to the PC.
- Install the application on the PC for details in the"3.2Application installation”。

After the 10Gb Ethernet line array industrial camera is connected to the cable, the application installed in the host computer can detect the camera online and ensure that the camera IP and the IP of the local computer are in the same network segment, and the camera will be able to operate normally.

The specific operation steps of network setting are as follows:

1. Open the software.

Open the application software by double-clicking the desktop shortcut . The software will automatically detect all online devices. The interface is shown in Figure 4-1.

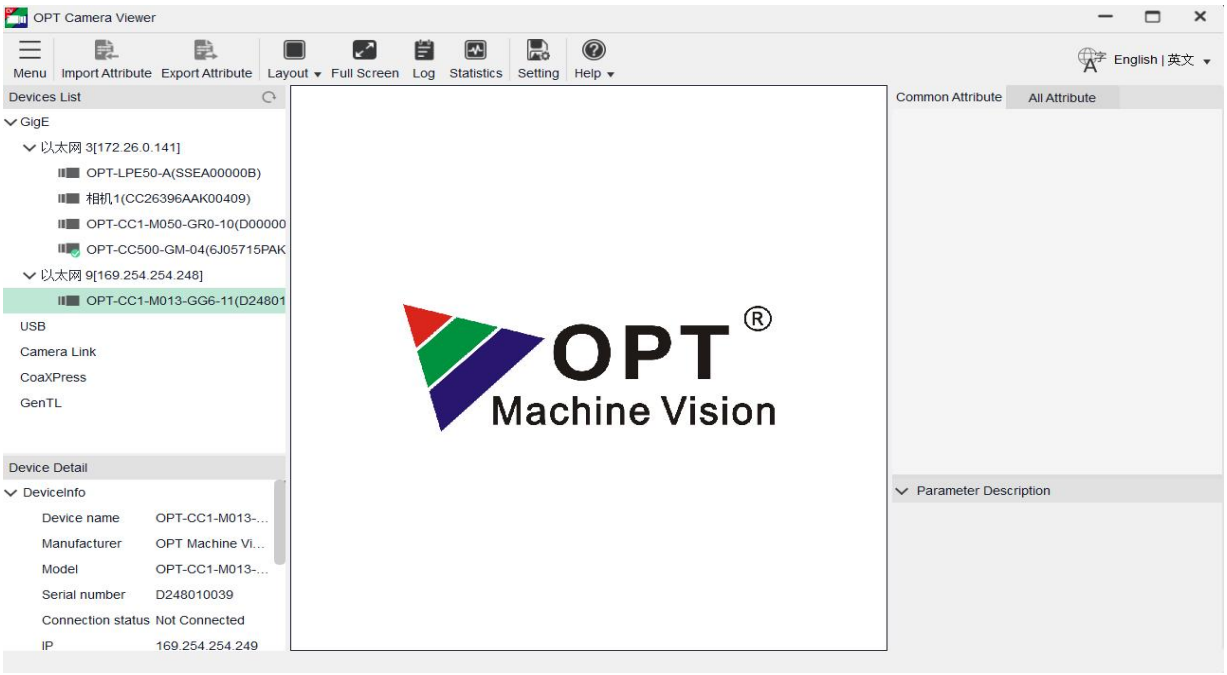


Figure 4-1 Software window

2. Camera IP settings.

Click to select the device information, and then right-click to configure the IP, as shown in Figure 4-2.

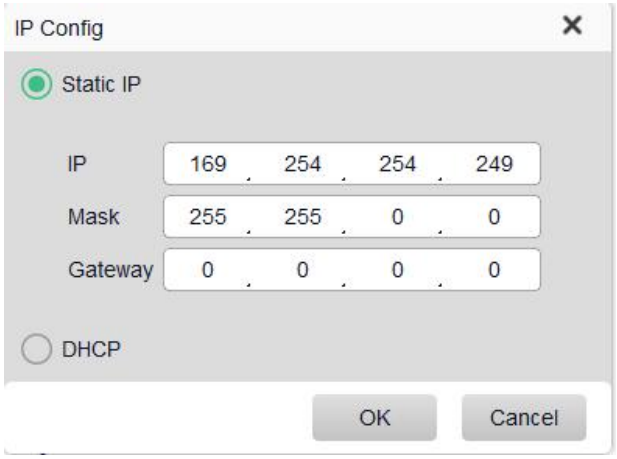


Fig. 4-2 IP setting interface

3. Equipment connection.

Select the target camera and click to connect the device. After the connection is successful, click.

The device tab and property tab are shown in Figure 4-2.

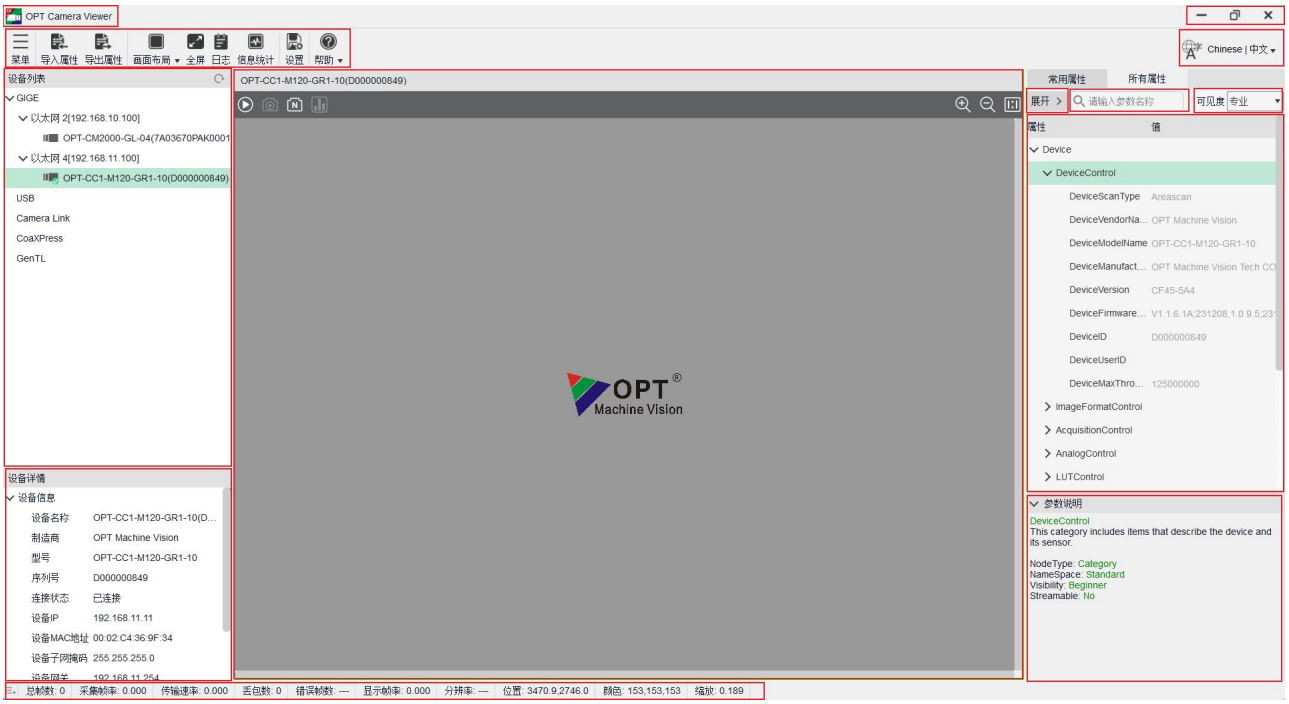
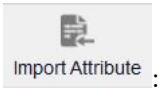
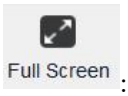
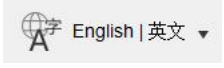


Figure 4-2 Successful device connection (Device tab)

说明

You can click to disconnect the device.

Table 4-1 OPT Camera Viewer parameters

Serial Number	Parameters	Parameter Description
1	Menu Bar	Provides functions for files, views, settings, tools, and help. For more information, see Table 4-2.
2	Control Tool Area	Provides quick, easy manipulation of camera images as follows: ●  : Click the icon to quickly import configuration parameter attribute information. (This icon appears gray when the camera is in stream fetching state.) ●  : Click the icon to quickly export the configuration parameter attribute information. (This icon appears gray when the camera is in stream fetching state.) ●  : The screen layout is a display setting for the preview multi-window layout. ●  : Click the icon to globally expand the image preview, press the keyboard ESC to return. (Global preview is also available by double-clicking under the Image Preview window) ●  : Quickly use the log information preview function, the information type can be customized selection and support the output to save as text view. ●  : Click this icon for a quick preview of the information statistics. ●  : Click this icon to jump to the settings window for image saving and caching options. ●  : Click the icon to quickly view the software version information, etc. ●  : Click this icon to select the software system display language.
3	Equipment List	Displays a list of devices that detect all online devices, Including GigE, USB, CameraLink and other common multi-protocol interface devices.  : Refresh. Click the icon to manually refresh the online device information.  Click this icon to manually configure the camera IP.:
		 : The device is in a connectable state.
		 : The device is connected.

4	Equipment Details	The details of the camera and the connection information of the interface are displayed here.
5	Image Preview Window	Display camera real-time image data, and the camera real-time information statistics and display.
6	Functional Parameter Area	Parameter items for this camera in different (operation level) roles.  : parameter visibility. You can click to select an entry, professional, or master role from the drop-down menu as needed. The parameters for each role are slightly different.
7	Parameter Interpretation Area	Click a parameter property item to display the explanation of the parameter.
8	Window Action Menu	●  : Maximize the window. ●  : Restores the window size downward. ● : Minimum speech window. ●  : Close the application.
9	Data Flow Area	The frame rate, total frames, transfer rate, error frames, and display frame rate in the camera capture are shown here.

Table 4-2 Menu Bar-Parameter Interpretation

Menu Bar		Description
File	Import Properties	Import configuration parameter attribute information as a file.
	Export Properties	Export configuration parameter attribute information as a file
	Save Ganicam XML	Saves the output XML file information.
View	Equipment List	 You can choose to open or hide the above four windows.
	Equipment Details	
	Common Properties	
	All Properties	
Setup	Image Save	Set the image save path, image format, etc.
	Cache Options	Set the cache parameters for the data stream.
Tools	Driver Management	The relevant basic drivers of the OPT Camera Viewer can be loaded or enabled autonomously.
	Bandwidth Management	Monitor network bandwidth and data transmission.
	Network card property settings	Can switch and configure the computer network card parameters.
	Log	Log information preview (including device parameter update, event message channel, pull stream cache and other event notifications), information type can be customized selection and support output saved as text view
	Information statistics	Statistics can be set to capture the frame rate, bandwidth, the number of images received, frame loss rate, the number of error images.
Help	Firmware Upgrade	The camera firmware can be upgraded.
	About	View the current software version information (software version number, software belonging and official website).
	Help documentation	Path location to place the relevant Operations Guide document

Chapter5 Main function description

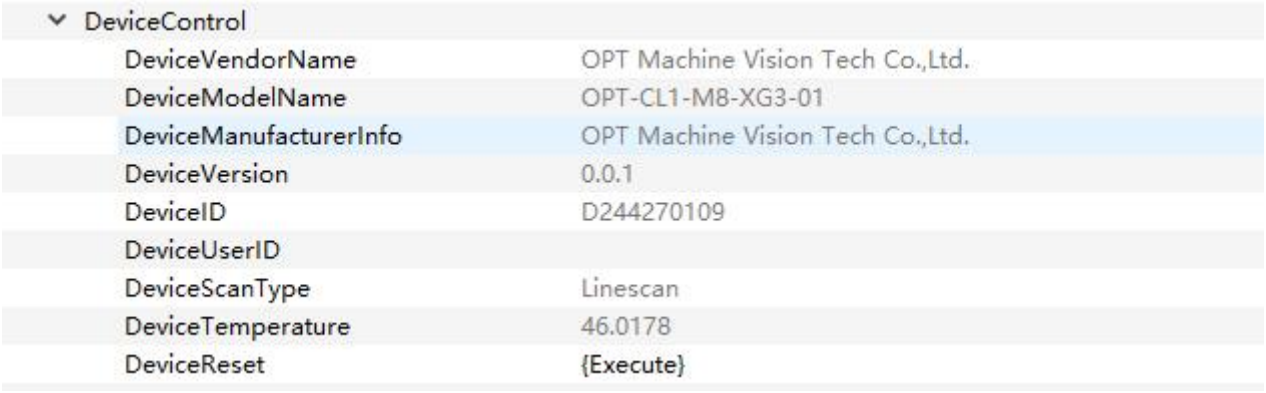
This chapter mainly explains the functional parameters related to the industrial camera, the specific parameter information please be inTable 4-1Look up in the serial number # 5.

说明

- Industrial cameras support user level selection: entry (Beginner), professional (Expert) or master (Guru), with slightly different parameters in the attribute window at each level. See the user level selection operationTable 4-1Serial number 5.
- The parameter item shown in black indicates that the parameter can be modified or set, and the parameter item shown in gray indicates that the parameter does not support a change or set in the current running mode.

5.1. Device Control (Equipment Management)

In the properties, you can view the device information and modify the device name, such asgraph 5-1As shown; for detailed parameter settings, seeTable 5-1。



graph5-1device management

outside5-1Equipment management — a parameter interpretation

parameter	explain
DeviceVendorName	Equipment supplier.
DeviceModeName	unit type.
DeviceManufacturerInfo	Equipment manufacturer.
DeviceVersion	Device software version.
Device ID	Device serial number.
DeviceUserID	User-defined device name.
DeviceScanType	Scan type of Sensor, such as line array or line array.

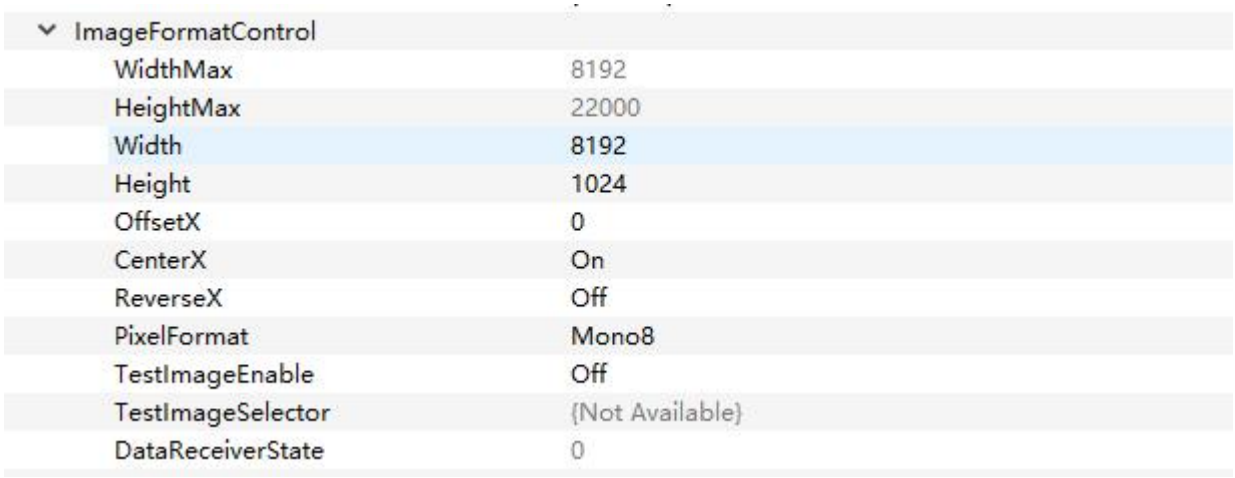
parameter	explain
CoreAuthChecksum	Checksum of the license equipment based on SHA-1
DeviceTemperature	Actual temperature value of the motherboard chip (℃).
DeviceReset	The device restart button, you can call the API to let the camera restart.

5.2.ImageFormatControl (Image format management)

In this attribute, the image size of the current device, image pixel format, region of interest, and test image mode can be modified, e. ggraph 5-2As shown; detailed parameter settingsgraph 5-2。

说明

The image output format supported by the industrial camera should be the format supported by the camera.



graph5-2Image format management

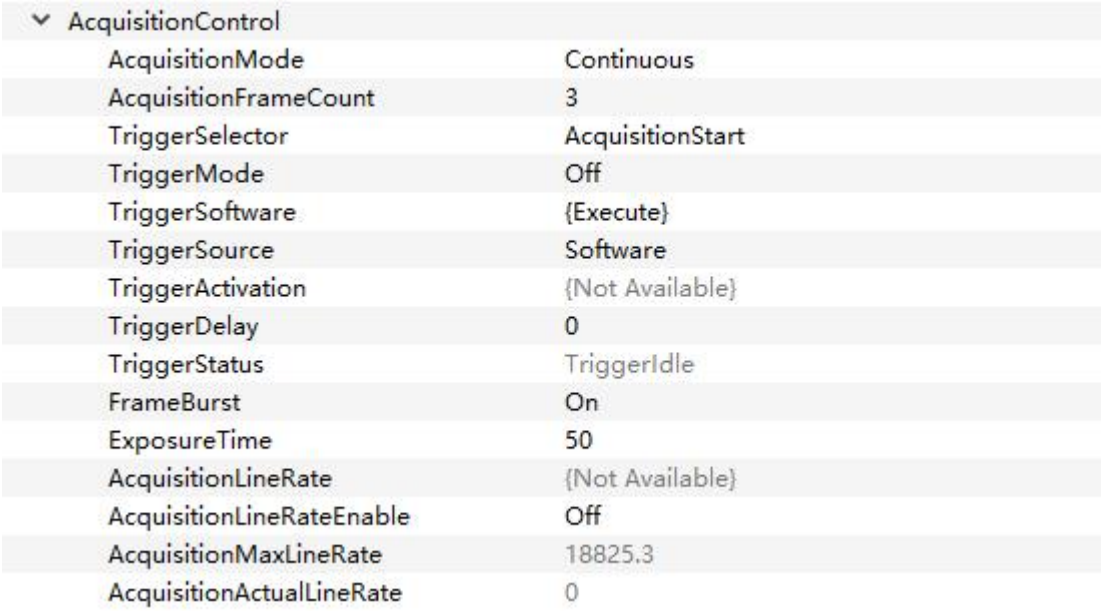
outside5-2Image format management- -parameter interpretation

parameter	explain
WidthMax	Maximum image width (pixels), will be affected by decimation, etc.
HeightMax	Maximum image height (pixels), will be affected by decimation, etc.
Width	Actual output of the image width (pixels).
Height	Actual output image height (pixels).
OffsetX	Image horizontal offset, from the top left, the maximum determined by the value of Width.
Center X	The output image is centered.
ReverseX	Image flipped horizontally, flipped is based on the Sensor original size, not based on the image after ROI.

parameter	explain
ReverseY	Image is flipped vertically. The flip is based on the Sensor original size, not based on the image after the ROI.
PixelFormat	Image output format. Different models have different support formats.
TestImage Enable	Test image enables control
TestImageSelector	Select the type of the test image sent by the device
DataReceiverState	Device data acquisition status

5.3. AcquisitionControl (Acquisition management)

In this attribute, the image acquisition mode, trigger mode, exposure time, etc., etcgraph 5-3As shown; for detailed parameter settings, seeTable 5-3。



graph5-3Collection management

outside5-3Acquisition management – Parameter interpretation

parameter	explain
AcquisitionMode	Image acquisition mode: • SingleFrame (Single frame): refers to one frame at a time, automatic stop pull flow after collection. • MultiFrame (Multiple frames): refers to the number of frames of AcquisitionFrameCount value, automatically stop pulling flow after acquisition. • Continue (Continuous): continuous acquisition until Acquisition Stop stops collecting pull flow.
AcquisitionFrameCount	Set the multi-frame acquisition effectively, control the trigger once, the camera to capture the number of pictures
TriggerSelector	Trigger type selection. Select FrameStart (Frame Trigger) or AcquisitionStart (Image Acquisition Trigger) in TriggerSelector and select On / Off on or off

parameter	explain
	this trigger mode in TriggerMode. Only one trigger mode is enabled for FrameStart (frame trigger) or AcquisitionStart (image acquisition trigger). When one type is enabled, the TriggerMode of the other type must be selected as Off.
TriggerMode	Controls whether the device trigger mode is turned on
TriggerSoftware	Soft trigger button. Click or call the API to produce a soft trigger.
TriggerSource	Trigger way. TriggerSource Support for SoftwareTrigger (software trigger) and lineN (hardware trigger). ● When selecting the software trigger, click or call the API in the TriggerSoftware to produce a soft trigger. ● When selecting hardware trigger, set RisingEdge (rise edge trigger) or FallingEdge (drop edge trigger) at TriggerActivation, and then the external cable completes the hard trigger. 说明 AcquisitionStart and FrameStart can select trigger sources separately.
TriggerActivation	Trigger way. It includes five triggering modes: rising edge, falling edge, double edge and high and low level, in the setting.
TriggerDelay	Trigger delay. Refers to the time when the camera receives the trigger signal and the trigger takes effect, if the trigger source is soft or hard trigger.
TriggerStatus	Displays the camera trigger state, waiting for or executing triggering
FrameBurst	Not long acquisition, when the frame touch level is opened, when the item is opened, the image will be collected to fill a short frame.
ExposureTime	exposure time.
ExposureAuto	automatic exposure. ● Off indicates off automatic exposure. ● Once indicates that the camera can automatically modify the exposure according to the ambient brightness, and the modified values are shown in gray in ExposureTime. Continue shows that the camera can continuously modify the ExposureTime according to the brightness of the environment, and the modified values are shown in gray in ExposureTime.
AcquisitionLineRate	Image line frequency. The AcquisitionLineRate sets the limit line frequency only when the AcquisitionLineRateEnable is True. 说明 If the set line frequency exceeds the maximum frame rate value of the camera in the current mode, the actual output frame rate of the
AcquisitionLineRateEnable	

parameter	explain
	camera is AcquisitionActualLineRate, rather than the value set by AcquisitionLineRate.
AcquisitionMaxLineRate	Maximum line frequency that can be set
AcquisitionActualLineRate	Line frequency of the actual camera acquisition image.

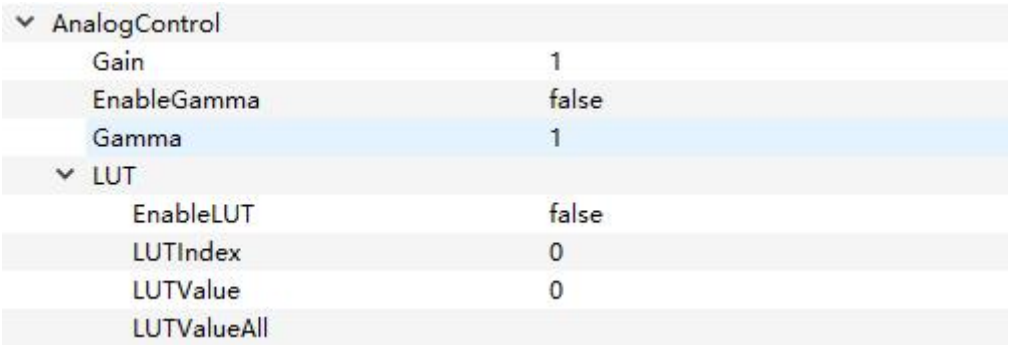
5.4. AnalogControl (analog control)

In this attribute, the image analog signal collected by the camera can be adjusted, including the lookup table, black level, Gamma correction, e. ggraph 5-4; see for detailed parameter settingsTable 5-4。

说明

LUT: the abbreviation for the search table.

LUT and Gamma are mutually exclusive. If gamma is enabled, LUT is not work; for LUT to take effect, Gamma needs to be set to 1.



graph5-4 Simulated control

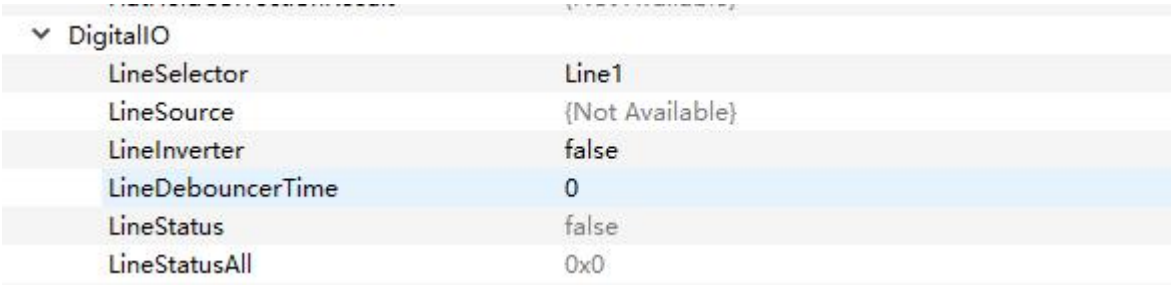
outside5-4 Simulation control- -parameter interpretation

parameter		explain
Gain		The larger the gain value, the brighter the image, different models have different setting ranges, the default value is 1. 说明 Priority enable enable analog gain.
EnableGamma		Used to set the image gamma value. Use to correct for a nonlinear correction of the image data due to the nonlinear response of the display etc, the smaller the Gamma value, the brighter the image. Gamma value is set to range from 1 to 4, with default to 1, Gamma treatment is not done. Set the image gamma value to be valid when EnableGamma is True.
Gamma		
LUT	EnableLUT	In this attribute, the gray range of interest, which can

parameter		explain
	LUTIndex	be a linear curve or a custom mapping curve In LUTIndex sets the value of the target traction object in all LUTs. In LUTValue, modify the value of the object pulled by LUTIndex. LUTValueAll Modify all Index values to the same value. The LUTIndex and LUTValue operations are valid only when the EnableLUT is True.
	LUTValue	
	LUTValueAll	

5.5.DigitalIO (Digital input / output)

In this attribute, different I / O input or output signals can be managed, e. ggraph 5-5; see for detailed parameter settingsTable 5-5。



graph5-5 IO input / output management

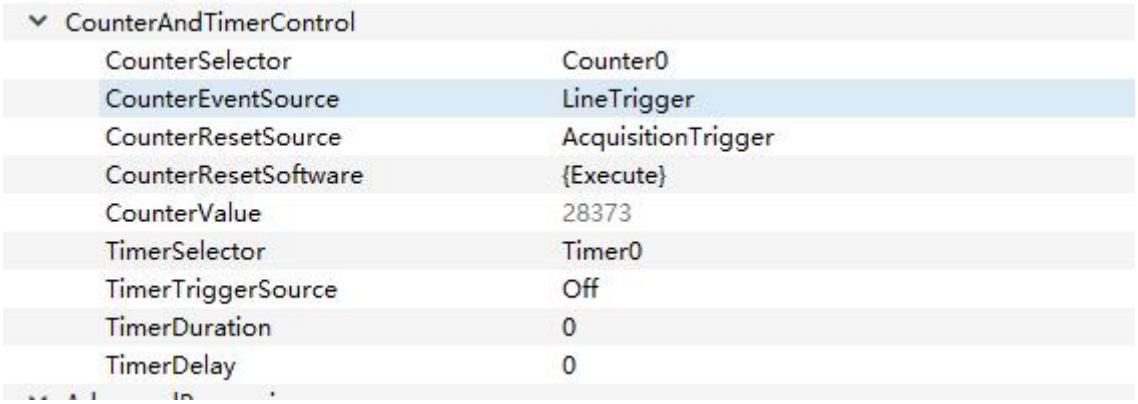
outside5-5 Digital input / output management-Parameter interpretation

parameter	explain
LineSelector	Use to select the external IO line to configure
LineSource	When selecting the IO line as the output, you can select the trigger source. There are several supported trigger sources: ● Inactive: Signal stability and unchanged ● ExposureActive: Output the signal when the exposure starts. ● FlashWindow: The light source controls the signal output. ● AcquisitionTriggerWait: Output acquisition trigger waiting state signal. ● FrameTriggerWait: The output frame triggers the waiting state signal. ● Timer0Active: The output signal when the counter 0 is full. ● Timer1Active: The output signal when the counter 1 is full.
LineInverter	To control the selected physical input or output line, True represents the signal, and False represents the signal.
LineDebouncerTime	When the IO line is the input, you can set the length of the extinction time. 说明 A pulse smaller than the set value is not considered as a valid trigger

parameter	explain
	input.
LineStatus	Indicates the current logical state of the selected row
LineStatusAll	Use to return the current state of all available lines.

5.6. Timer Control (Timer management)

In this attribute, the device-specific delay unit can be set, as shown in Figgraph 5-6As shown; for detailed parameter settings, seeTable 5-6。



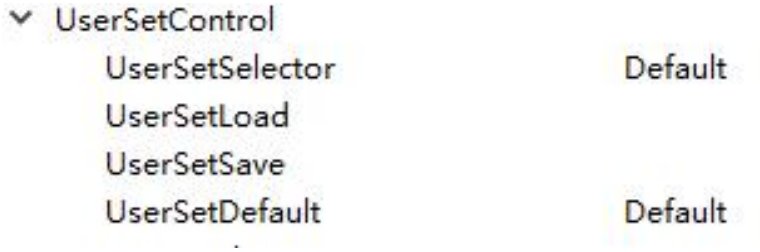
graph5-6 Counter and timer controls

outside5-6 Timer management- -parameter interpretation

parameter	explain
CounterSelector	Select the counter, the counter0, or the counter1.
CounterEventSource	Select the counter trigger count time, and the trigger count will set the counter trigger source according to the set trigger mode.
CounterResetSource	The counter reset control source, after setting, the original signal triggers the counter current value clear 0.
CounterResetSoftware	Reset soft start, when CounterResetSource is set to software, click execute counter clear 0.
CounterValue	Displays the counter count current value.
TimerSelector	Select the timer of the target to set it up.
TimerTriggerSource	Select the trigger source for the timer.
TimerDelay	Set the delay time of the timer (in us) after receiving the trigger.
TimerDuration	Set the hold time of the device timer (in us).

5.7. UserSetControl (User Settings Management)

In this attribute, you can save or load the user-adjusted parameter scheme, and set the default parameter configuration when the client is opening, such asgraph 5-7As shown; for detailed parameter settings, seeTable 5-7。



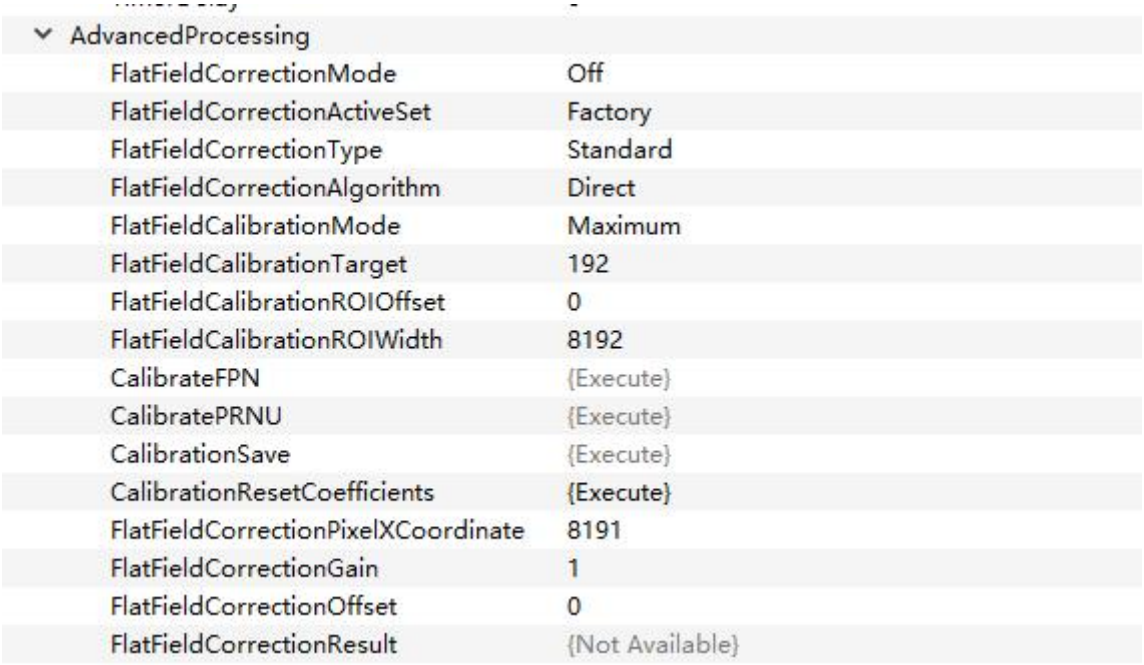
graph5-4User Settings Management

outside5-4User settings management-parameter settings

parameter	explain
UserSetSelector	UserSetSelector User settings for group selection. Currently supports Default, UserSet1, and UserSet2 Select which group to use for the subsequent UserSetLoad, UserSetSave.
UserSetLoad	UserSetLoad User settings loading. Restvert the camera configuration to a user-selected configuration.
UserSetSave	UserSetSave User settings to save. Save the current configuration to the selected group, which is not supported for the Default group.
UserSetDefault	Power up to the default user settings. UserSet1 and UserSet2 need to be performed before UserSetSave can be displayed here.

5.8. AdvancedProcessing (AdvancedProcessing)

In this attribute, you can set the parameter terms of the automatic function, as shown in Figgraph 5-8As shown; for detailed parameter settings, seeTable 5-8。



graph5-8 Advanced processing parameter item settings

outside5-8 Advanced processing parameter term setting- -parameter interpretation

parameter	explain
FlatFieldCorrectionMode	Flat field correction mode; OFF closes flat field correction, ON opens correction mode (for correction), active activates flat field correction (use this mode after correction)
FlatFieldCorrectionActiveSet	Different parameters saved were selected in active state, including factory, userset1, userset2 and userset3
FlatFieldCorrectionType	Correction type, and the default is the standard
FlatFieldCorrectionAlgorithm	Flat-field correction algorithm, with direct correction, low-pass filtering and then correction
FlatFieldCalibrationMode	Open field correction, correction mode, optional Maximum (maximum value), Average (average value), Target (target value) three correction modes.
FlatFieldCalibrationTarget	When FlatFieldCalibrationMode is set to Target (target value) correction, this parameter is valid and the image can be corrected to the target gray range.
FlatFieldCalibrationROlOffset	This item can control the effective range of level field correction; when two parameters are combined, FlatFieldCalibrationROlOffset is the effective area offset; FlatFieldCalibrationROlWidth is the width range of the effective area; the range setting must not exceed the maximum width range of the camera.
FlatFieldCalibrationROlWidth	
CalibrateFPN	Dark field correction, click execution, correction in the dark environment.
CalibratePRNU	Open field correction, click execution, in the environment is half bright (gray scale above 150), correction use.
CalibrationSave	Use with FlatFieldCorrectionActiveSet, save the corrected parameters, and can be directly selected in the next use.
CalibrationResetCoefficients	Reset, reset the correction parameters, and reply to the images before the correction
FlatFieldCorrectionPixelXCoordinate	Flat field corrected pixel X coordinates to set the image gain before pixel flat field correction.
FlatFieldCorrectionGain	Flat-field correction gain,
FlatFieldCorrectionOffset	Correct the offset
FlatFieldCorrectionResult	Flat-field correction results

5.9. ISPControl (ISP Management)

In this attribute, the image sharpness, brightness, saturation, contrast, etc. can be adjusted, e. ggraph 5-10See; see Table 5-9 for detailed parameter settings.

说明

Chromaticity, saturation is only suitable for color cameras (model OPT-CC1-M060-GR 1-02,

OPT-CC1-M050-GG 1-03, OPT-CC1-M200-GR 1-00 does not have this function.) The ten gigabit wire scan series supports digital shift, brightness, and contrast.

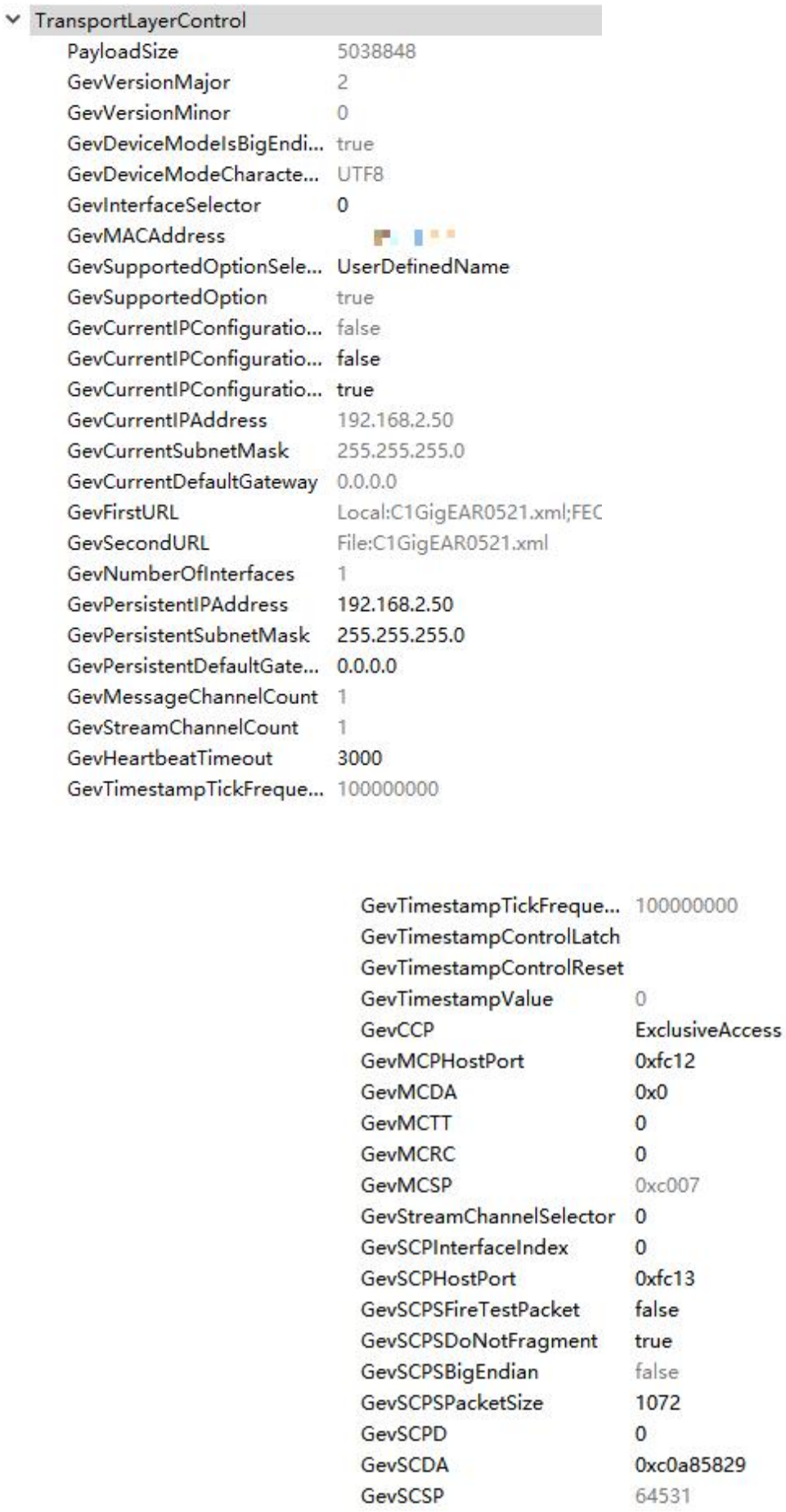
graph5-9 The ISP management

outside5-9 ISP management-Parameter interpretation

parameter	explain
Digital Shift	Adjust (0~4) DigitalShift to collect all data left (default is 0).
Brightness	luminance. Adjust the exposure target brightness value, the default value is 50, the larger the value, the exposure will adjust the image brighter, the maximum can be set to 100, the minimum set to 0.
Contrast	Contrast Set the contrast intensity, the larger the value, the more obvious the contrast, the maximum can be set to 100.

5.10. TransportLayerControl (Transport Layer Management)

In this attribute, you can set the transmission protocol-related parameters of the camera, such asgraph 5-11; see also for detailed parameter settingsTable 5-11。



graph5-0 Transport layer management

outside5-0 Transport layer management

parameter	explain
PayloadSize	The length of each message.
GevVersionMajor	Major version of the protocol specification.
GevVersionMinor	Minor version of the protocol specification.
GevDeviceModelBigEndian	End value of the device register.
GevDeviceModeCharacterSet	The character set used by all the strings of the boot register.
GevInterfaceSelector	The number of network ports of the device, the value is timed from 0, so the value is 0.
GevMACAddress	The MAC address of the network port.
GevSupportedOptionSelector	GevSupportedOptionSelector Select one of the existing projects to support the GEV access. GevSupportedOption Returns whether the GevSupportedOptionSelector selection item supports the selected GEV.
GevSupportedOption	
GevCurrentIPConfigurationLLA	Turn on the LLA function. When True is selected in GevCurrentIPconfigurationLLA, the IP is LLA.
GevCurrentIPConfigurationDHCP	Turn on the DHCP function. When True is selected in GevCurrentIPconfigurationDHCP, the IP of the device is DHCP, and the device IP can be automatically obtained.
GevCurrentIPConfigurationPersistentIP	Static IP function. When True is selected in GevCurrentIPconfigurationPersistentIP, the IP is static. 说明 The priority relationship of the three IP configurations is: static IP> DHCP> LLA.
GevCurrentIPAddress	The IP address of the current device.
GevCurrentSubnetMask	The subnet mask of the current device.
GevCurrentDefaultGateway	The gateway of the current device.
GevFirstURL	Gets the first URL address for the GenICam XML
GevSecondURL	Gets the second URL address for the GenICam XML
GevNumberOfInterfaces	Number of physical network interfaces supported by the device.
GevPersistentIPAddress	Set up the static IP address of the device.
sGevPersistentSubnetMask	Set the subnet mask for the static IP of the device.
GevPersistentDefaultGateway	The gateway to set the static IP of the device.
GevMessageChannelCount	Displays the number of message channels supported by

	this device.
GevStreamChannelCount	Displays the number of flow channels supported by this device.
GevHeartbeatTimeout	Set the heartbeat timeout time.
GevTimestampTickFrequency	Defines the frequency of the timestamps.
GevTimestampControlLatch	Locch the current timestamp to GevTimestampValue.
GevTimestampControlReset	Reset used for internal timestamps.
GevTimestampValue	Time stamp used for storing the latch.
GevCCP	Control the application for access to the camera. ● ExclusiveAccess: The application of the connected camera can modify the register. ● ControlAccess: The application connected to the camera can only read the register and can not modify the register.
GevMCPHostPort	Set up the port for the camera message channel.
GevMCDA	Set the destination address of the camera message channel.
GevMCTT	Message channel timeout time.
GevMCRC	Maximum number of message channel repasses.
GevMCSP	Displays the source port number of the message channel.
GevStreamChannelSelector	If the camera supports multiple channels, select Channel No.
GevSCPinterfaceIndex	Displays the logical channel number corresponding to the device.
GevSCPHostPort	Port number used in the camera circulation channel.
GevSCPSFireTestPacket	Send a test message.
GevSCPSDoNotFragment	If the message is too long, whether to slice to send, and add the slice position 1 in the IP head.

GevStreamChannelSelector	If the camera supports multiple channels, select Channel No.
GevSCPinterfaceIndex	Displays the logical channel number corresponding to the device.
GevSCPHostPort	Port number used in the camera circulation channel.
GevSCPSFireTestPacket	Send a test message.
GevSCPSDoNotFragment	If the message is too long, whether to slice to send, and add the slice position 1 in the IP head.
GevSCPSBigEndian	Set the end of the pixel data flow for the circulation channel.
GevSCPSPacketSize	Set up the message length of the circulation channel.
GevSCPD	Control of the interval between the packets.

	说明 Modifying this value can reduce the requirements for the network card, but the maximum bandwidth will be affected to some extent, and the acquisition time of a single frame will be increased.
GevSCDA	The destination address of the circulation channel.
GevSCSP	The source port of the circulation

5.11. ActionControl (Action management)

In this attribute, the type of event notification can be selected and enabled, as shown in Figgraph 5-8As shown; for detailed parameter settings, seeTable 5-8。

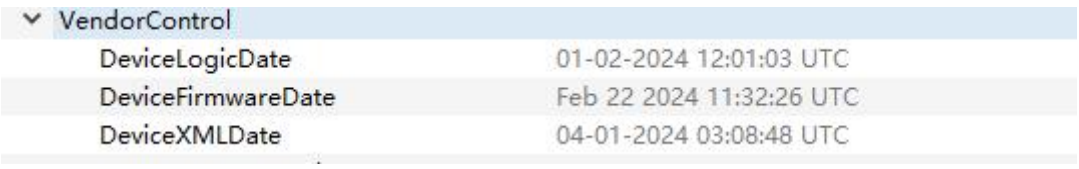
graph5-11 Event notification

outside5-11 Event notification management-parameter interpretation

parameter	explain
ActionDeviceKey	Provide a device key that allows the device to check the validity of the action commands.
ActionSelector	Select the action signal to which to apply further action settings
ActionGroupMask	Provide a mask, using which the device will verify the operation upon receipt of the action protocol message.
ActionGroupKey	Provide a key, which the device will use to verify the operation when receiving the operation protocol message.

5.11. VendorControl (Supplier management)

In this attribute, firmware update information for the device is included, see Table 5-12 for detailed parameter settings.



graph5-12 Event notification

outside5-12 Supplier management- -parameter interpretation

parameter	explain
DeviceLogicDate	The devices logical bitstream burns the date
DeviceFirmwareDate	Logical firmware burn date of the device
DeviceXMLDate	Device electronic file XML date

Chapter6 Frequently asked questions

You may encounter some problems when using industrial cameras. If the following problems occur, please check according to the solution, if

Unable to solve or encounter other problems, please contact our technical support timely.

problem description	Possible cause	resolvent
Start the client software and find the camera	The camera does not start properly or the network cable connection is abnormal	Check the camera power and network connection (observe the LED indicator and the Link light of the camera).
Starting the client can enumerate to the camera, but the connection failed	The camera and the client are not in the same LAN The camera has been connected by another program	Use the IP Configuration tool to modify the IP address After disconnect the other program control of the camera, reconnect.
Preview the picture all black	The lens aperture is closed The camera works abnormally	Turn on the lens aperture Power off restart camera
Preview is normal but cannot trigger	Trigger mode is not open or trigger source selection error External trigger connection error	Confirm whether the trigger mode of the camera is on, and whether the selected trigger source and the used IO interface are consistent Confirm that the trigger signal input and the wiring are normal
Megabit network cameras failed to reach ten gigabit bandwidth	The network used is gigabit	Check the network transmission environment to ensure that the linked devices (switches, network cable, network card) are connected.
External trigger cannot be enabled.	External trigger connection error. The Trigger mode did not select an external trigger.	Select the correct trigger mode, and ensure that the external connection is correct.
When the client software views the image, it finds that the image is reversed.	When the equipment is installed, the direction installation is wrong.	You can correct the image by using Properties> ImageFormatControl> ReverseX (horizontal flip) or ReverseY (vertical flip) software.

Chapter7 Contact way

China · Dongguan headquarters
One of 66 South Xingfa Road, Changan Town, Dongguan City, Guangdong Province
Tel：+86-769-82716188 Fax：+86-769-81606698
Email：optmv@optmv.com Web：www.optmv.com

Suzhou subsidiary: Opte Vision Technology (Suzhou) Co., LTD
11 / F, Building D, Dongchuang Science Park, No.216 Jinfeng Road, Mudu Town, Wuzhong District, Suzhou City, Jiangsu Province
Tel：+86-512-67904405 Email：opt8016@optmv.com

Shenzhen branch
Room 09,21 / F, Building F, Xihai Mingzhu Building, No.1 Taoyuan Road, Nanshan District, Shenzhen City

Central China Service Point
Room 1107, Building A, Building 2, Optics Valley Technology Port, No.18, Huayuan North Road, East Lake High-tech Zone, Wuhan city, Hubei Province
Tel：+86-027-87969886 Email：yangfan@optmv.com

Southwest Service Point
Room 601-3, Building 3, Jewelry Center, No.52, Shuxin Road, Jinniu District, Chengdu City, Sichuan Province
Tel：+86-18938210069 Email：opt8008@optmv.com

Ningde subsidiary: Nde Opt Vision Technology Co., LTD
Construction Industry Association Building 6F, No.36, Funing North Road, Dongqiao Economic and Technological Development Zone, Ningde City, Fujian Province
Tel：+86-18938210580Email：liyongjun@optmv.com

A Hong Kong subsidiary: OPT Vision Limited
Room 1003,10 / F, Block 1, Lippo Centre, 89 Admiralty Road, Hong Kong

Taiwan service point
24212F, 226 Central Road, Xinzhuang District, Xinbei City, Taiwan
Tel：+886-903117815 Email：opttw2@optmv.com

A German subsidiary: OPT Machine Vision GmbH
Wilhelm-Haas-Strasse 6,70771 Leinfelden-Echterdingen (Stuttgart), Germany
Tel：+49（0）71144708961 Email：sales.eu@optmv.com

American service point
20195 Stevens Creek Blvd. #230, Cupertino, CA95014
Tel：+1-408-8165577 Email：edwardyu@optmv.com

Service Points in Malaysia
110-02-01, Summerton COMplex, 11900 Bayan Lepas, Penang, Malaysia
Tel：+60 164484978 Email：optmy@optmv.com