



# ID2000 Series Smart Code Reader

User Manual

## Legal Information

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### About this Manual

The Manual includes instructions for using and managing the Product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version of this Manual at the Hikrobot website (<https://www.hikrobotics.com/>). Please use this Manual with the guidance and assistance of professionals trained in supporting the Product.

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## Regulatory Information

### FCC Information

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

#### FCC Conditions

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

### EU Conformity Statement



This product and - if applicable - the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European standards listed under the EMC Directive 2014/30/EU, LVD Directive 2014/35/EU, the RoHS Directive 2011/65/EU.






2012/19/EU (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: <http://www.recyclethis.info>.



2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: <http://www.recyclethis.info>.

## Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 <b>Danger</b>	Indicates a hazardous situation which, if not avoided, will or could result in death or serious injury.
 <b>Caution</b>	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
 <b>Note</b>	Provides additional information to emphasize or supplement important points of the main text.

## Available Model

This manual is applicable to the ID2000 Series Smart Code Reader.

## Safety Instruction

These instructions are intended to ensure that the user can use the product correctly to avoid danger or property loss.

### Laws and Regulations

The device should be used in compliance with local laws, electrical safety regulations, and fire prevention regulations.

### Power Supply

- When wiring or dismantling, make sure that the device power is cut off, and do not operate under electrification.
- Avoid contact with exposed circuit. When the device is powered on, avoid contact with exposed junctions and parts.
- DO NOT connect multiple devices to one power adapter, to avoid over-heating or fire hazards caused by overload.
- Make sure the plug is properly connected to the power socket.

### Transportation

- The product contains precision optical components and electronic components. During transportation, storage and installation, incorrect operations like heavy pressure and violent vibration should be avoided. Otherwise, the product may be damaged.
- Avoid sudden collision, and pack the product with the accompanied carton and cushioning material or similar package.

### Using Environment

- Do not touch the heat-radiating part of the device to avoid scalding.
- In order to reduce the risk of fire or electric shock, do not let the product get wet or damp.
- Do not drop objects onto the product and avoid vigorous vibration.
- Keep the product away from magnetic interference.
- Do not use the product in extremely heat, extremely cold, dusty environment, corrosive environment or high humidity environment.
- Do not aim the product lens at objects of strong light, such as the sun and incandescent lamp. Otherwise, the lens may be damaged.
- The product should be stored in dry environment without corrosive gas. Avoid placing the product in direct sunlight and poorly ventilated locations, or near heat sources such as heater or heating (ignoring this warning may lead to fire hazards).
- Do not operate in explosive environment.
- Keep the surrounding area well ventilated to avoid heat accumulation. Do not contact the radiator directly to avoid scald.

### Electrostatic Protection

- Remove all conductive objects (such as jewelry, watch, etc.) on the product body before touching the product, and touch the grounding metal bracket by hand to release the static electricity.
- It is suggested to wear anti-static suit to prevent damage to the equipment caused by static electricity.
- When installing or maintaining the product, please wear anti-static wrist band or anti-static gloves. Make sure that the wristband is tightly attached to the skin and is reliably grounded.
- It is forbidden to touch exposed circuit boards with bare hands. Static electricity generated by human body may damage electrostatic sensitive components on circuit boards.
- When touching electrostatic sensitive components or devices, proper grounding measures must be taken.
- Put electrostatic sensitive components into anti-static bags for protection.
- It is suggested to place humidifier in dry environment to maintain suitable humidity and reduce static electricity generation.

### Maintenance

- If the product is not working properly, contact the store or the nearest service center. Do not disassemble or modify the device in any way. (The company does not bear any liability for any problem arising from unauthorized modification or maintenance).
- Please properly preserve all the original packaging materials of the product so that when

problems arise, the product can be packed with packaging materials and sent to the agent or returned to the manufacturer for processing. The company does not bear any liability for accidental damage during transportation caused by non-original packaging.

- This product is a precision electronic device, no components can be maintained by user, please do not disassemble the device arbitrarily.

### **Cleaning**

Please do not touch the image sensor directly. If the sensor needs to be cleaned, please use a clean rag and wet it with alcohol, then gently wipe off the dirt; if the device is not in use, please cover the image sensor with dust cover for protection.

### **Installation**

Please do not install the product on vibrating surface or places that are vulnerable to impact.

### **Personnel Requirement**

Quality requirements for installation and maintenance personnel: qualification certificate or working experience in weak current system installation and maintenance, and relevant working experience and qualifications. Besides, the personnel must possess the following knowledge and operation skills:

- The basic knowledge and operation skills of low voltage wiring and Low voltage electronic circuit connection.
- The ability to comprehend the contents of this manual.

## **Contact Information**

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## Chapter 1 Appearance

### Note

Appearance here is for reference only. Refer to the device's specification for detailed dimension information.

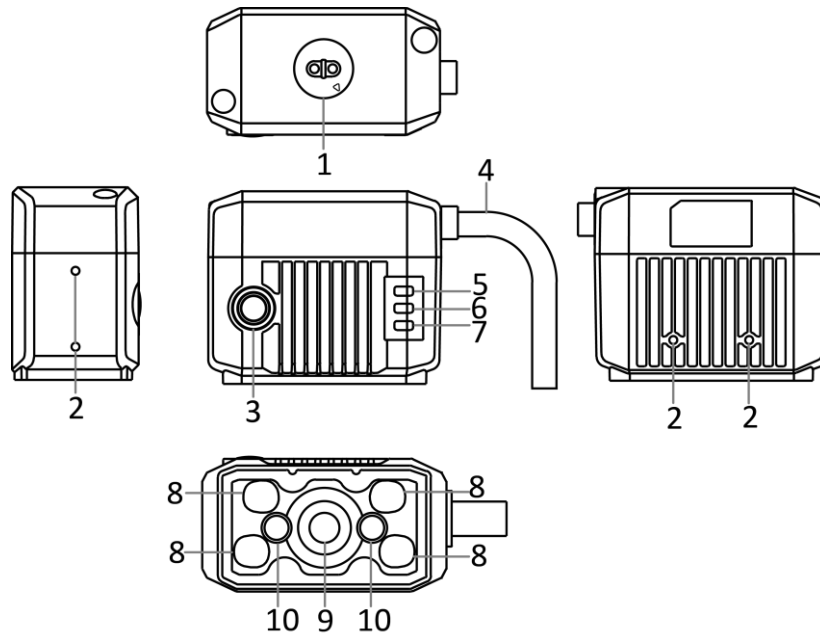


Figure 1-1 Appearance (Type I Vari Focal Device)

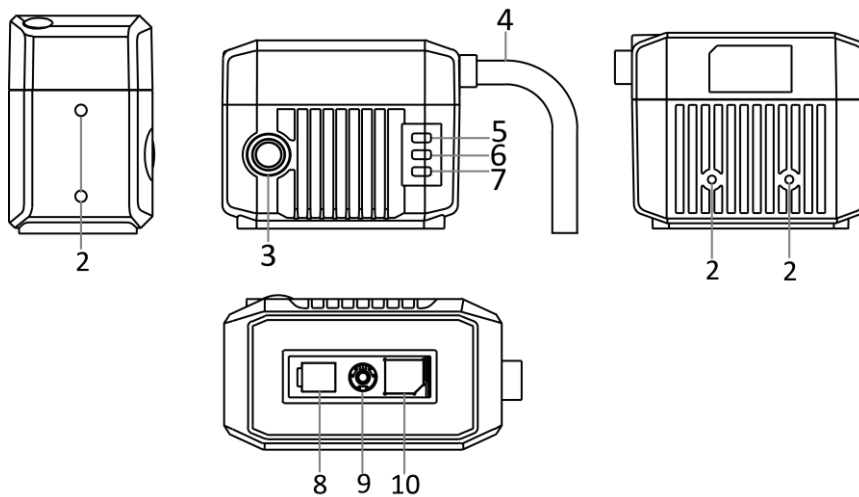




Figure 1-2 Appearance (Type II Fixed Focal Device)

**Table 1-1 Description**

No.	Name	Description
1	Focus Knob	<p>It is used to adjust focal length manually.</p> <p> <b>Note</b> Only type I device has the focus knob, and type II device does not support adjusting focal length.</p>
2	Screw Hole	It is used to fix the device to the installation position. You should use M2 screw.
3	Button	When the device is in trigger mode, press the button and the device triggers once.
4	SR Cable	SR cable connector provides power, I/O, Ethernet, and serial port.
5	LNK Indicator	It is a network status indicator. The indicator is flashing green when the network transmission is normal. Otherwise, it is unlit.
6	STS Indicator	It is a status indicator. The indicator is green when the device operates normally. When the device starts up or exception occurs, it is red.
7	PWR Indicator	It is a power indicator. The indicator is green when the device operates normally. Otherwise, it is red.
8	Light Source	<p>It is a LED light source used to provide light when the device acquires images.</p> <p> <b>Note</b> The light source color is different by device models.</p>
9	Sensor	It is used to acquire images.
10	Aiming Light	It helps to indicate the field of view and aim targets.

## Chapter 2 Interface

### 2.1 17-Pin Interface for Vari Focal Device

The vari focal devices all have a 17-pin interface as shown below. However, their specific pin definitions are different by device models.

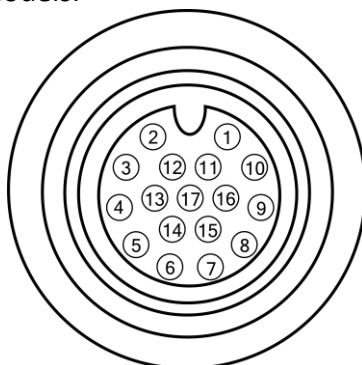


Figure 2-1 17-Pin Interface

#### 2.1.1 Pin Definitions for Network Device

Refer to the table below to get pin definitions for the network device.

##### Note

You should refer to the table below and the label attached to the cable to wire the device.

Table 2-1 Pin Definitions (Network Device)

No.	Signal	I/O Signal Source	Description
1	DC_PWR	--	Direct current power supply positive
2	GND	Line 0/1/2/3-	Direct current power supply negative
3	OUT_R	--	Output pull-up and pull-down resistor
4	RS232_TX	--	RS-232 serial port output
5	RS232_RX	--	RS-232 serial port input
6	MDI0+	--	Fast Ethernet signal MDI0+
7	MDI1-	--	Fast Ethernet signal MDI1-
8	GPIO2	Line 2+	It can be configured as input or output, and is output by default.

No.	Signal	I/O Signal Source	Description
9	GND	Line 0/1/2/3-	Direct current power supply negative
10	GPIO3	Line 3+	It can be configured as input or output, and is output by default.
11	GND	Line 0/1/2/3-	Direct current power supply negative
12	IN_R	--	Input pull-up and pull-down resistor
13	Reserved		
14	MDI0-	--	Fast Ethernet signal MDI0-
15	MDI1+	--	Fast Ethernet signal MDI1+
16	GPIO0	Line 0+	It can be configured as input or output, and is input by default.
17	GPIO1	Line 1+	It can be configured as input or output, and is input by default.

## 2.1.2 Pin Definitions for USB Device

Refer to the table below to get pin definitions for the USB device.



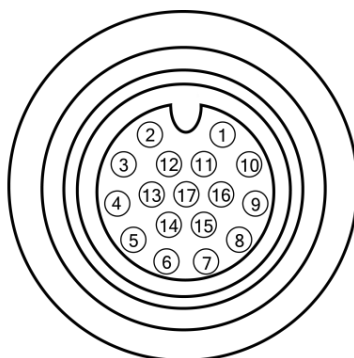
**Note**

You should refer to the table below and the label attached to the cable to wire the device.

**Table 2-2 Pin Definitions (USB Device)**

No.	Name	Description	No.	Name	Description
1	DC_PWR	Direct current power supply positive	9	Reserved.	--
2	Reserved.	--	10	Reserved.	--
3	USB_DM	USB signal negative	11	GND	Direct current power supply negative
4	Reserved.	--	12	USB_DP	USB signal positive
5	Reserved.	--	13	Reserved.	--
6	Reserved.	--	14	Reserved.	--
7	Reserved.	--	15	Reserved.	--
8	Reserved.	--	16	Reserved.	--
--	--	--	17	Reserved.	--

## 2.2 17-Pin Interface for Fixed Focal Device



**Figure 2-2 17-Pin Interface**

Refer to the table below to get pin definitions for the fixed focal device.

### Note

You should refer to the table below and the label attached to the cable to wire the device.

**Table 2-3 Pin Definitions (Fixed Focal Device)**

No.	Signal	I/O Signal Source	Description
1	DC_PWR	--	Direct current power supply positive
2	OUT_COM	LineOut 0/1 signal ground	Output common port
3	OUT_R	--	Output pull-up and pull-down resistor
4	RS232TX	--	RS-232 serial port output
5	RS232RX	--	RS-232 serial port input
6	MDI0+	--	Fast Ethernet signal MDI0+
7	MDI1-	--	Fast Ethernet signal MDI1-
8	OPTO_OUT0	LineOut 0 signal line	Opto-isolated output 0
9	IN_COM	LineIn 0/1 signal ground	Input common port
10	OPTO_OUT1	LineOut 1 signal line	Opto-isolated output 1
11	GND	--	Direct current power supply negative
12	IN_R	--	Input pull-up and pull-down resistor
13	Reserved		
14	MDI0-	--	Fast Ethernet signal MDI0-
15	MDI1+	--	Fast Ethernet signal MDI1+

No.	Signal	I/O Signal Source	Description
16	OPTO_IN0	LineIn 0 signal line	Opto-isolated input 0
17	OPTO_IN1	LineIn 1 signal line	Opto-isolated input 1

## 2.3 17-Pin Cable

You should use the supplied 17-pin cable to wire the device according to actual demands.

### Note

The supplied 17-pin cable is different by device models.

### 2.3.1 17-Pin Cable for Network Device

You should use the supplied 17-pin cable for network device to wire the network device. The cable has a 9-pin serial port connector that corresponds to 4th and 5th pins of the device's 17-pin interface, and a RJ45 connector that corresponds to 6th, 7th, 14th, and 15th pins of the 17-pin interface.

### Caution

You cannot use the 12 V power plug of the 9-pin serial port connector and power supply open line at the same time. Otherwise, damaging to power supply may occur.

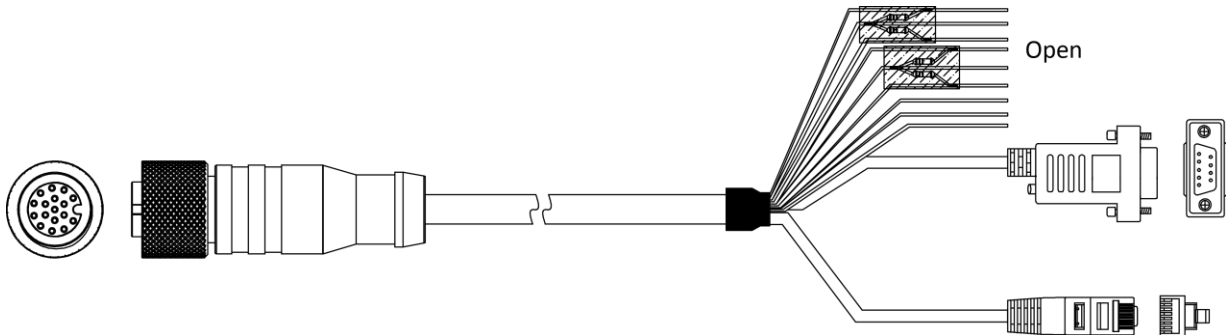


Figure 2-3 17-Pin Cable for Network Device

### 2.3.2 17-Pin Cable for USB Device

You should use the supplied 17-pin cable for USB device to wire the USB device. The cable has a 17-pin M12 connector for connecting with the device, and a USB interface for connecting with the PC.

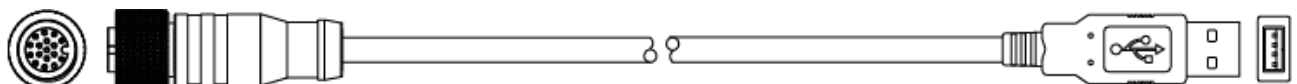


Figure 2-4 17-Pin Cable for USB Device

## Chapter 3 I/O Wiring

### 3.1 Electrical Feature and Wiring of Vari Focal Device

#### 3.1.1 Bi-Directional Signal

The device supports 4-ch bi-directional signals: Line 0/1/2/3. You can set them as input signal or output signal according to demands.

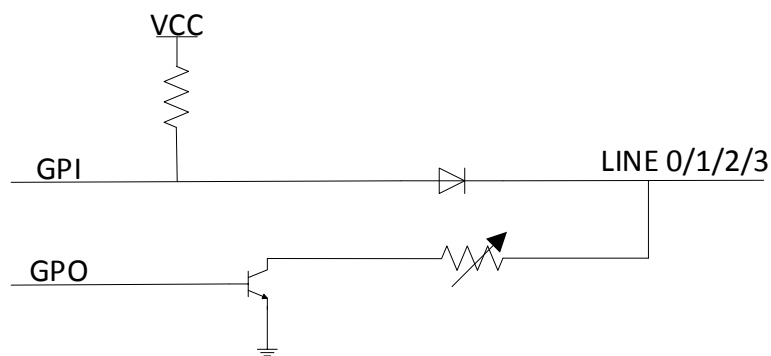


Figure 3-1 Internal Circuit of Bi-Directional Signal

#### Configured as Input Signal



#### Note

The maximum input current is 25 mA.

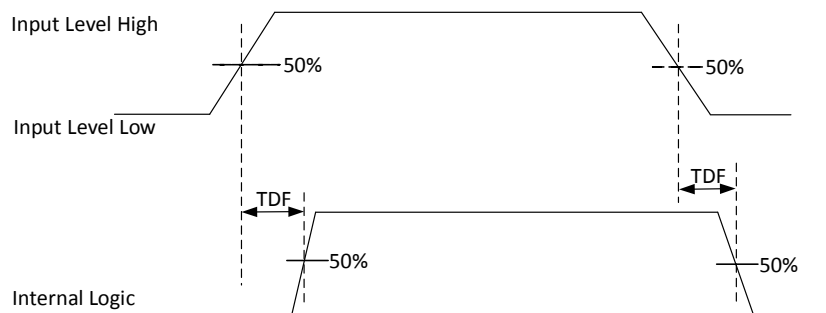


Figure 3-2 Input Logic Level

Table 3-1 Input Electrical Feature

Parameter Name	Parameter Symbol	Value
Input Logic Level Low	VL	1 VDC
Input Logic Level High	VH	2 VDC
Input Falling Delay	TDF	200 ns
Input Rising Delay	TDR	1 $\mu$ s
Input Falling Time	TF	200 ns
Input Rising Time	TR	1 $\mu$ s

## Configured as Output Signal

### Note

- If the external voltage and resistance change, the corresponding current of output signal and output logic level low may differ.
- The maximum output current is 25 mA.

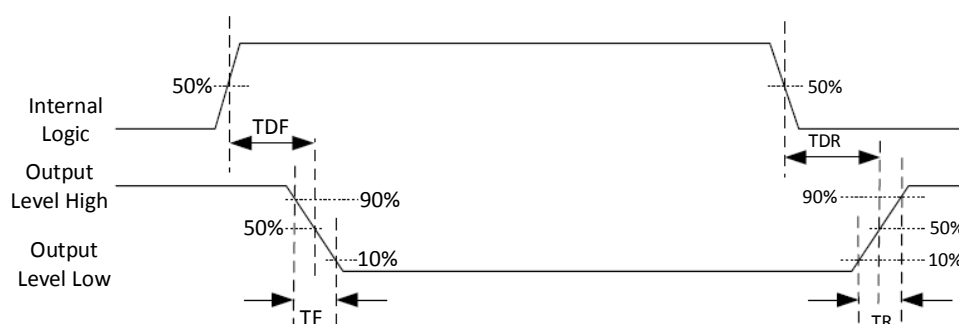


Figure 3-3 Output Logic Level

When the external voltage is 12 VDC and pull-up resistor is 1 K $\Omega$ , output electric feature is shown below.

Table 3-2 Output Electrical Feature

Parameter Name	Parameter Symbol	Value
Output Logic Level Low	VL	500 mV
Output Logic Level High	VH	12 VDC (external pull-up resistor)
Output Falling Delay	TDF	330 ns
Output Rising Delay	TDR	4.4 $\mu$ s
Output Falling Time	TF	116 ns

Parameter Name	Parameter Symbol	Value
Output Rising Time	TR	3.8 $\mu$ s

When the pull-up resistor is 1 K $\Omega$ , relation between different external voltages and output logic level low is shown below.

**Table 3-3 Parameters of Output Logic Level Low**

External Voltage	Output Logic Level Low (VL)
3.3 VDC	180 mV
5 VDC	260 mV
12 VDC	500 mV
24 VDC	900 mV

### 3.1.2 Input Signal Wiring

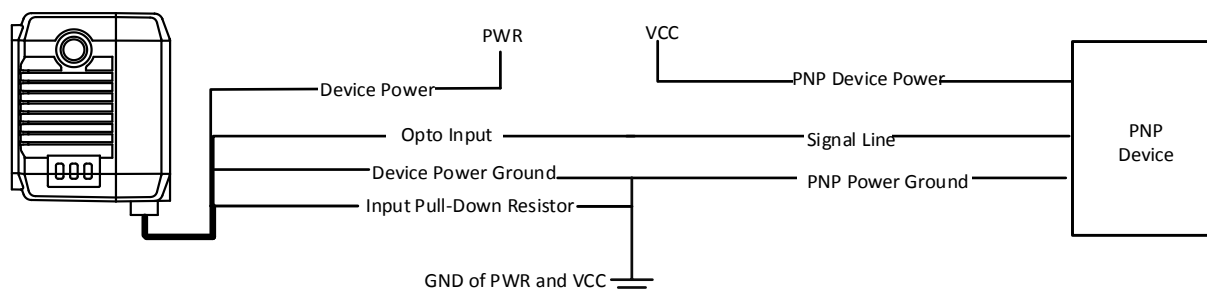
The device can receive the external input signal via I/O interface, and this section introduces input signal wiring.

#### Note

- Input signal wiring may differ by external device types.
- The supplied 17-pin cable has pull-up and pull-down resistors.
- The voltage of VCC should be equal to or less than that of PWR. Otherwise, the output signal exception may occur.

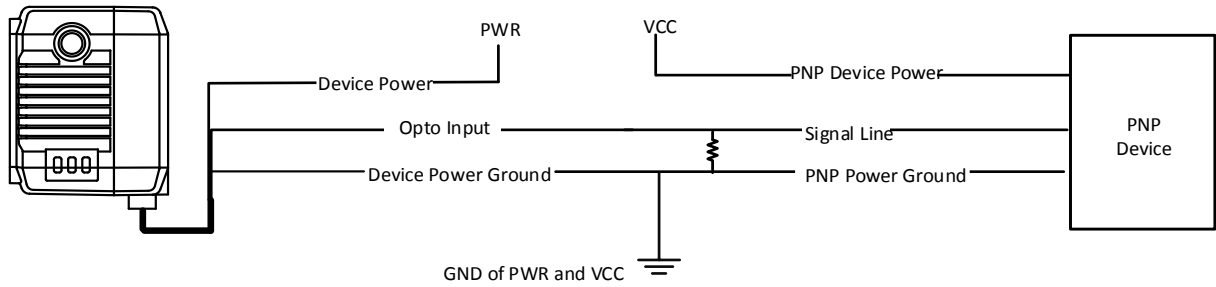
#### PNP Device

If you use the pull-down resistor of the supplied 17-pin cable, the wiring is shown below.



**Figure 3-4 Input Signal Connecting to PNP Device (Pull-Down Resistor of 17-Pin Cable Used)**

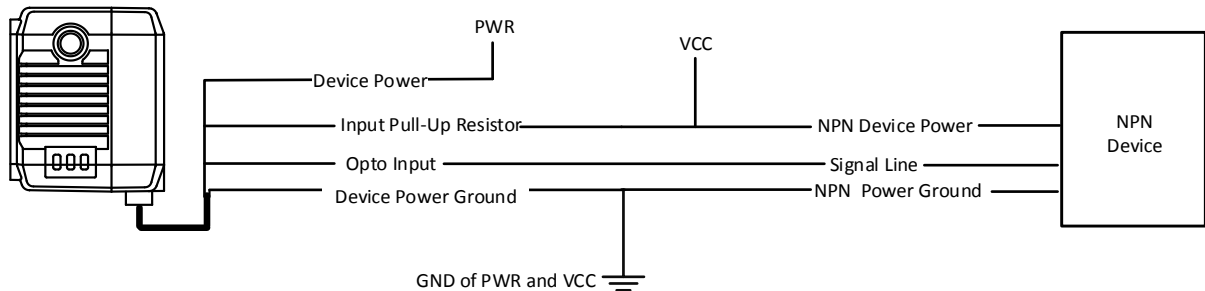
If you use external pull-down resistor, it is recommended to use 1 K $\Omega$  pull-down resistor.



**Figure 3-5 Input Signal Connecting to PNP Device (External Pull-Down Resistor Used)**

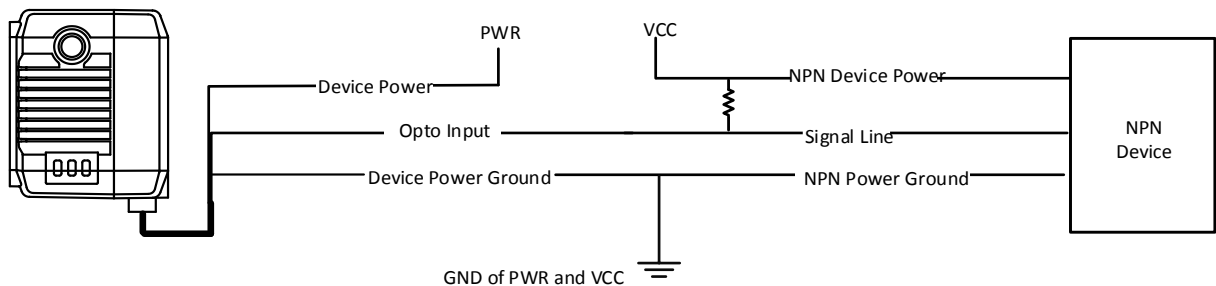
## NPN Device

If the VCC of NPN device is 12 VDC or 24 VDC, and the pull-up resistor of the supplied 17-pin cable is used.



**Figure 3-6 Input Signal Connecting to NPN Device (Pull-Up Resistor of 17-Pin Cable Used)**

If the VCC of NPN device is 12 VDC or 24 VDC and the external pull-up resistor is used, it is recommended to use 1 K $\Omega$  pull-up resistor.



**Figure 3-7 Input Signal Connecting to NPN Device (External Pull-Up Resistor Used)**

## Switch

The switch can provide low electrical level to trigger the bi-directional I/O.

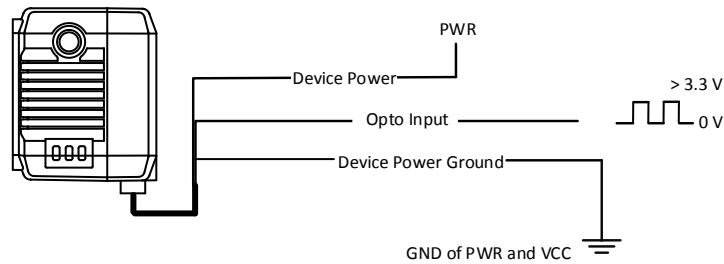


Figure 3-8 Input Signal Connecting to Switch

### 3.1.3 Output Signal Wiring

If the device uses bi-directional I/O as output signal, it is required to use a pull-up resistor when connecting the device to both PNP and NPN devices.

#### Note

- Output signal wiring may differ by external device types.
- The supplied 17-pin cable has pull-up and pull-down resistors.
- The voltage of VCC should be equal to or less than that of PWR. Otherwise, the output signal exception may occur.

If you use the pull-up resistor of the supplied 17-pin cable, the wiring is shown below.

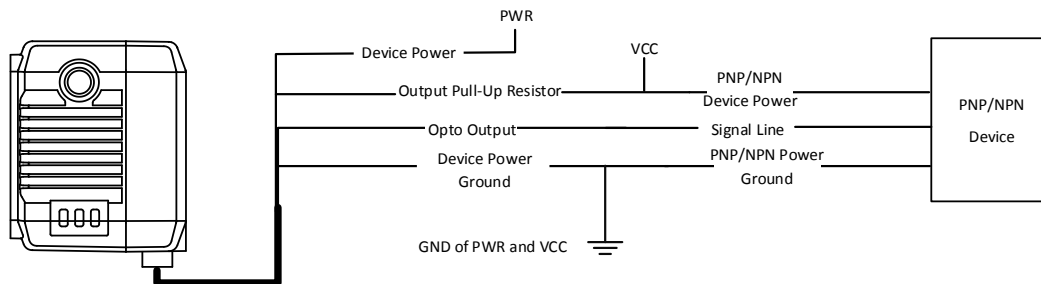


Figure 3-9 Output Signal Connecting to PNP/NPN Device (Pull-Up Resistor of 17-Pin Cable Used)

If you use external pull-up resistor, it is recommended to use 1 K $\Omega$  pull-up resistor.

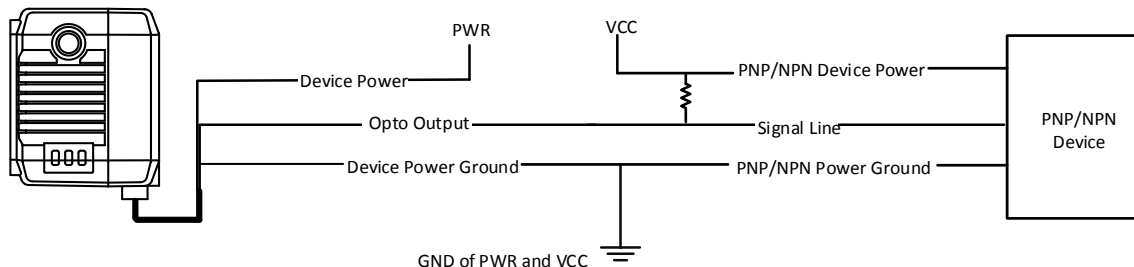


Figure 3-10 Output Signal Connecting to PNP/NPN Device (External Pull-Up Resistor Used)

## 3.2 Electrical Feature and Wiring of Fixed Focal Device

### 3.2.1 Input Signal

The device's LineIn 0/1 are input signals, and their internal circuit is as follows.

#### Note

- The input voltage ranges from 5 VDC to 30 VDC.
- The maximum current is 25 mA.
- The breakdown voltage is 36 VDC. Keep voltage stable.

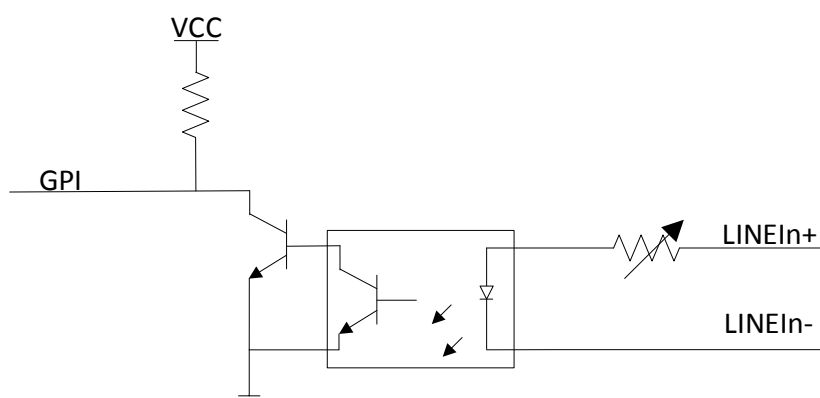


Figure 3-11 Internal Circuit of Input Signal

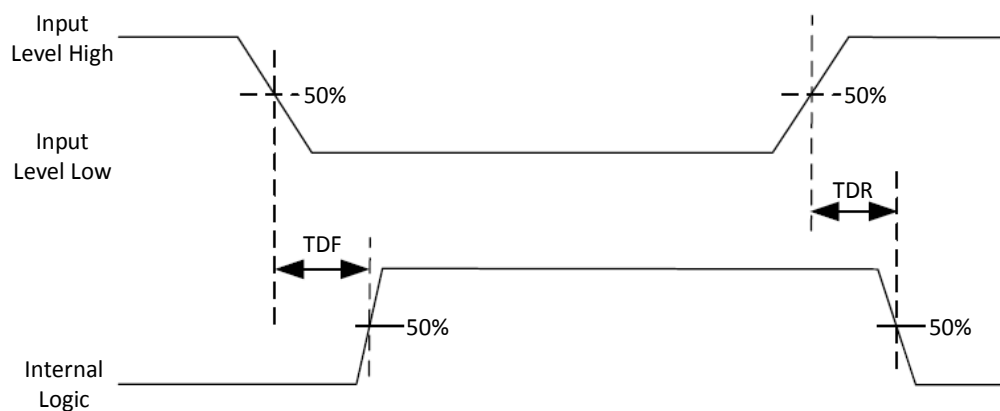


Figure 3-12 Input Logic Level

Table 3-4 Input Electrical Feature

Parameter Name	Parameter Symbol	Value
Input Logic Level Low	VL	1.5 VDC
Input Logic Level High	VH	2 VDC
Input Falling Delay	TDF	81.6 $\mu$ s
Input Rising Delay	TDR	7 $\mu$ s

### 3.2.2 Output Signal

The device's LineOut 0/1 are output signals, and their internal circuit is as follows.

#### Note

- The output voltage ranges from 5 VDC to 30 VDC.
- The maximum current is 25 mA.
- Do not directly connect with inductive load (e.g. DC motor, etc.) when outputting.
- If the external voltage and resistance change, the corresponding current of output signal and output logic level low may differ.

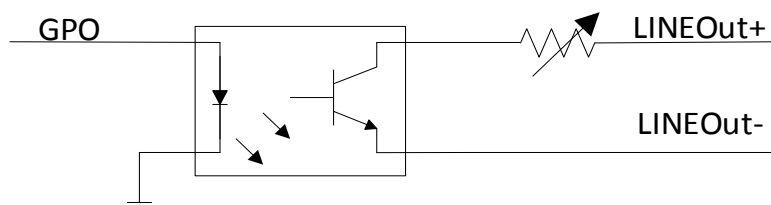


Figure 3-13 Internal Circuit of Output Signal

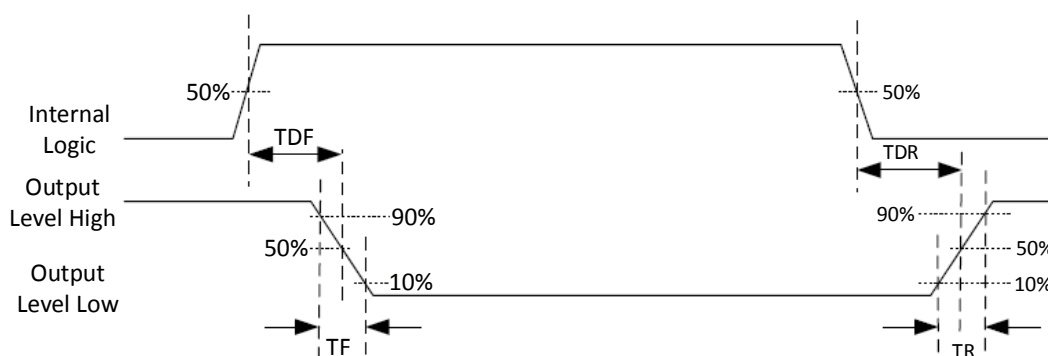


Figure 3-14 Output Logic Level

Table 3-5 Output Electrical Feature

Parameter Name	Parameter Symbol	Value
Output Logic Level Low	VL	730 mV
Output Logic Level High	VH	3.2 VDC
Output Falling Delay	TDF	6.3 $\mu$ s
Output Rising Delay	TDR	68 $\mu$ s
Output Falling Time	TF	3 $\mu$ s
Output Rising Time	TR	60 $\mu$ s

### 3.2.3 Input Signal Wiring

The device can receive the external input signal via I/O interface, and this section introduces input signal wiring.

#### Note

- Input signal wiring may differ by external device types.
- The supplied 17-pin cable has pull-up and pull-down resistors.
- The voltage of VCC should be equal to or less than that of PWR. Otherwise, the output signal exception may occur.

#### PNP Device

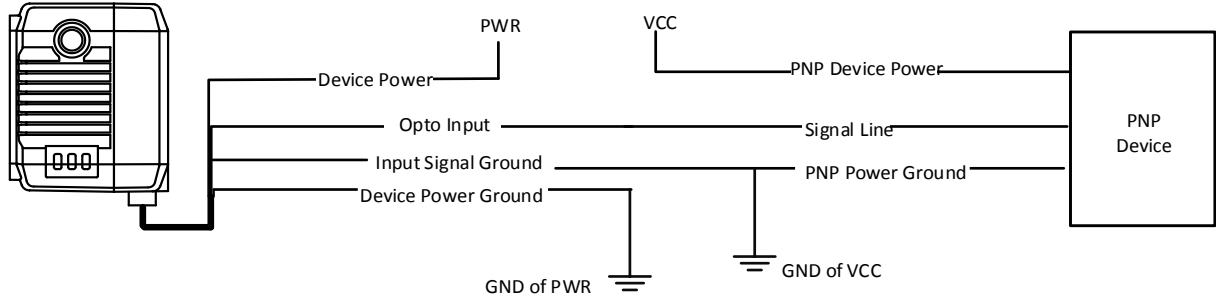
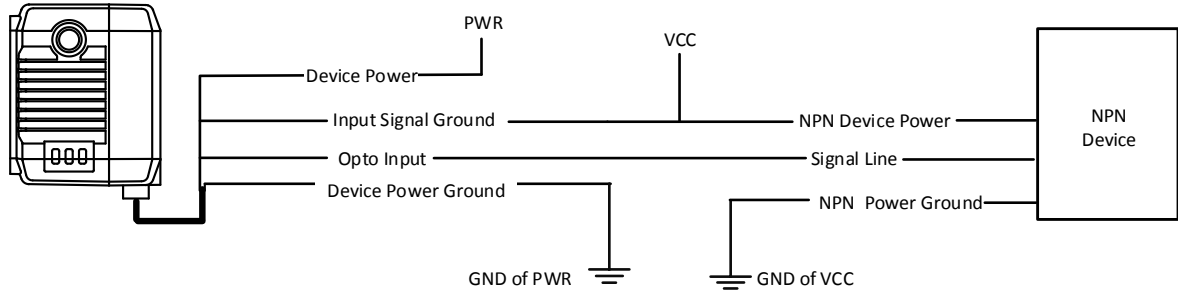


Figure 3-15 Input Signal Connecting to PNP Device

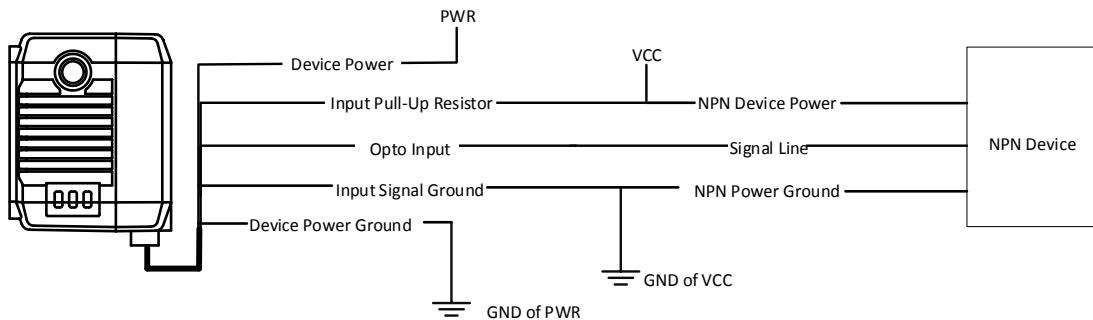
#### NPN Device

If the VCC of NPN device is 12 VDC or 24 VDC and pull-up resistor is not used, its wiring is shown below.



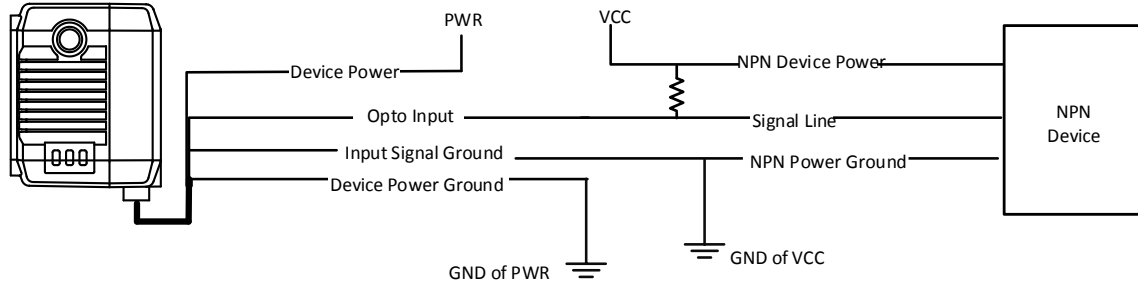
**Figure 3-16 Input Signal Connecting to NPN Device without Pull-Up Resistor**

If the VCC of NPN device is 12 VDC or 24 VDC, and the pull-up resistor of the supplied 17-pin cable is used.



**Figure 3-17 Input Signal Connecting to NPN Device (Pull-Up Resistor of 17-Pin Cable Used)**

If the VCC of NPN device is 12 VDC or 24 VDC and the external pull-up resistor is used, it is recommended to use 1 K $\Omega$  pull-up resistor.



**Figure 3-18 Input Signal Connecting to NPN Device (External Pull-Up Resistor Used)**

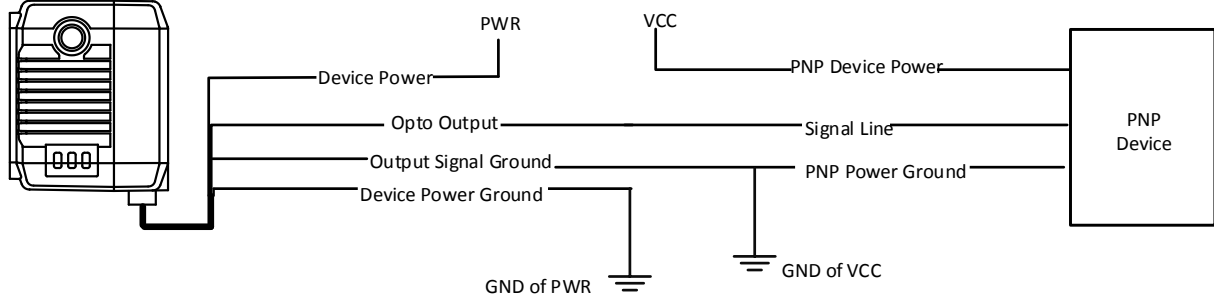
### 3.2.4 Output Signal Wiring

The device can output signal to external device via I/O interface, and this section introduces output signal wiring.

#### Note

- Output signal wiring may differ by external device types.
- The supplied 17-pin cable has pull-up and pull-down resistors.
- The voltage of VCC should be equal to or less than that of PWR. Otherwise, the output signal exception may occur.

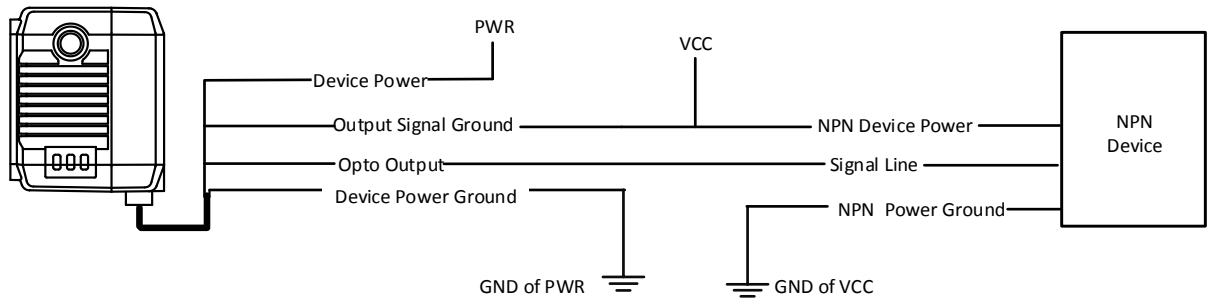
### PNP Device



**Figure 3-19 Output Signal Connecting to PNP Device**

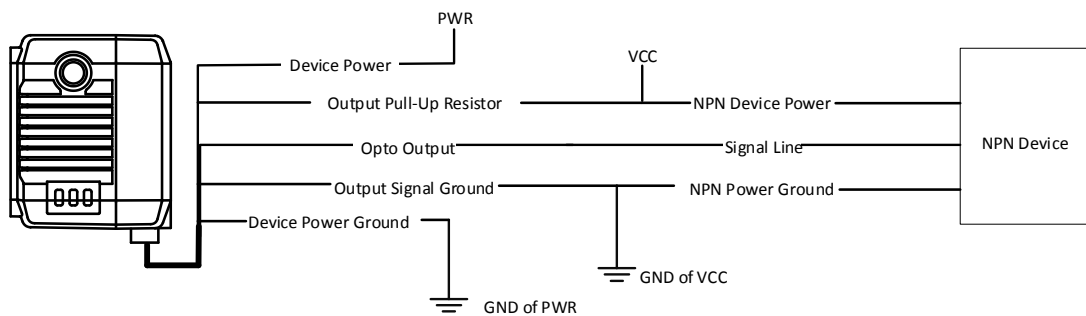
### NPN Device

If the VCC of NPN device is 12 VDC or 24 VDC and pull-up resistor is not used, its wiring is as follows.



**Figure 3-20 Output Signal Connecting to NPN Device without Pull-Up Resistor**

If the VCC of NPN device is 12 VDC or 24 VDC, and the pull-up resistor of the supplied 17-pin cable is used.



**Figure 3-21 Output Signal Connecting to NPN Device (Pull-Up Resistor of 17-Pin Cable Used)**

If the VCC of NPN device is 12 VDC or 24 VDC and the external pull-up resistor is used, it is

recommended to use 1 K $\Omega$  pull-up resistor.

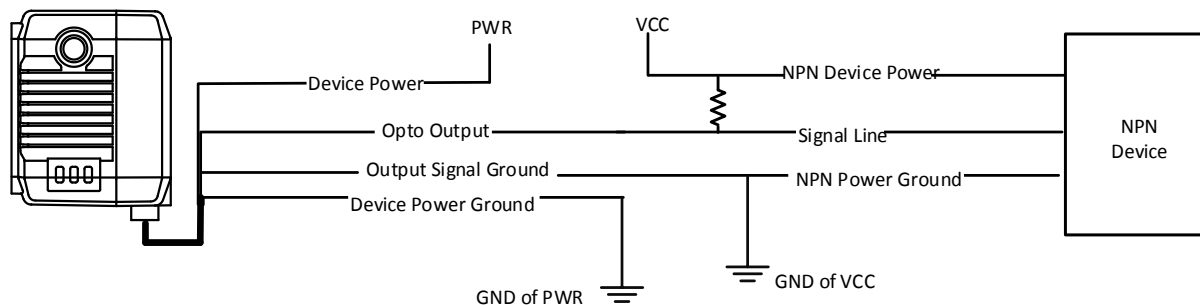


Figure 3-22 Output Signal Connecting to NPN Device (External Pull-Up Resistor Used)

### 3.3 RS-232 Serial Port

The device supports outputting data via RS-232 serial port, and the supplied 17-pin cable has a 9-pin serial port connector. Refer to the figure and table below for pin definitions.

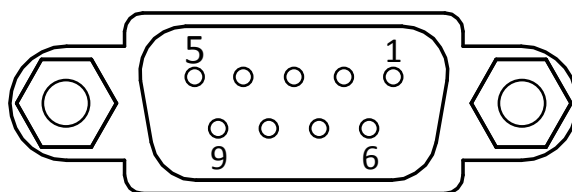


Figure 3-23 9-Pin Connector

Table 3-6 Pin Definitions

Pin No.	Name	Description
2	TX	Transmits data
3	RX	Receives data
5	GND	Signal ground

## Chapter 4 Installation

### 4.1 Installation Preparation

You need to prepare following accessories before installation.

**Table 4-1 Accessories**

No.	Name	Quantity	Description
1	17-Pin Cable	1	It refers to the supplied 17-pin cable that is included in the package.
2	Power Adapter or Switch Power Supply	1	You should select suitable power adapter or switch power supply according to the device power supply and consumption. You need to purchase separately.
3	Screw Package	1	It refers to the supplied four M2 × 6 screws that are used to fix the device to the installation position.

### 4.2 Install Device

#### Before You Start

- Make sure the device in the package is in good condition and all the assembly parts are included.
- Make sure all the related equipment is power-off during the installation.

#### Steps

1. Use M2 screws to fix the device to the installation position.
2. Use the supplied 17-pin cable to wire the device.
  - For the network device, insert RJ45 connector of the 17-pin cable into a switch or a PC for debugging images or transmitting data, and connect the device to a power adapter or a switch power supply for power supply.
  - For the USB device, connect the M12 connector of the 17-pin cable to the device, and connect the USB interface of the 17-pin cable to the PC.

---

#### Note

For the USB device, connect it to external devices that support USB3.0 for power supply and data transmission.

---

## Chapter 5 Device Connection

Device connection to the client software is required for device's configuration and remote operations. This section introduces how to install the client software, set PC environment, connect the device to the client software, etc.

### 5.1 Install Client Software

IDMVS is a client software for device configuration and remote operations.

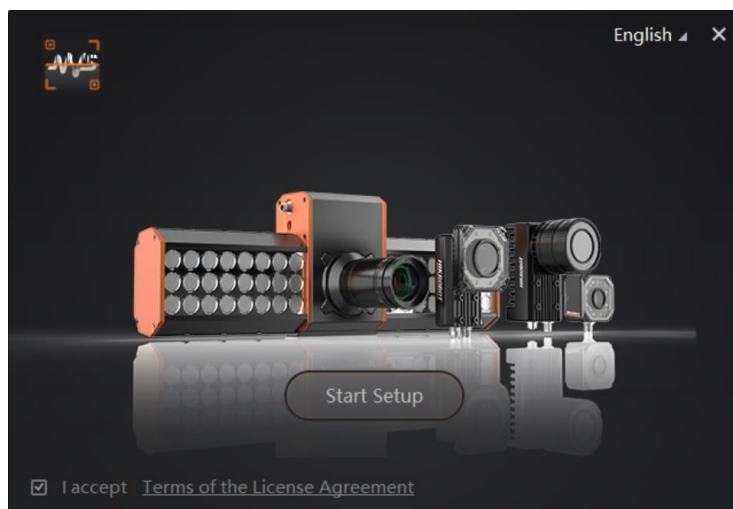
#### Steps

---

##### Note

- Check the Windows version. The client software is compatible with 32/64-bit Windows XP/7/10.
  - Contact the technical support to get the installation package of IDMVS 2.2.0 USB version for the USB device. For the network device, you can download the installation package from <https://en.hikrobotics.com/>.
  - The graphic user interface may differ by versions of client software you use.
- 

1. Double click the installation package to start installing the client software.
2. Select the language.
3. Read and check **Terms of the License Agreement**.
4. Click **Start Setup**.
5. Select installation directory and click **Next**.



**Figure 5-1 Installation Interface**

6. Finish the installation according to the interface prompts.

## 5.2 Set PC Environment

To ensure stable client running and data transmission, you are recommended to set PC environment. For the network device, you need to turn off the firewall and set PC network. For the USB device, you need to check the USB drive on the PC.

### 5.2.1 Turn off Firewall for Network Device

#### Steps

---

##### Note

For different Windows versions, the path name or interface may differ. Please refer to the actual condition.

---

1. Go to Windows Firewall.

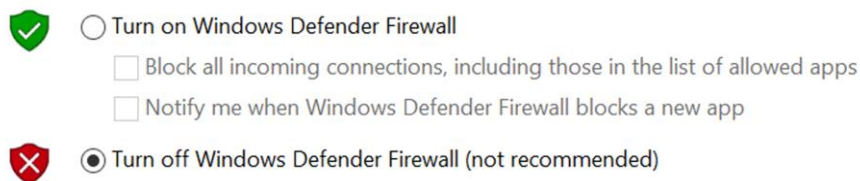
Windows XP system: Click **Start** → **Control Panel** → **Security Center** → **Windows Firewall**.

Windows 7 system: Click **Start** → **Control Panel** → **Windows Firewall**.

Windows 10 system: Click **Start** → **Control Panel** → **System and Security** → **Windows Defender Firewall**.

2. Click **Turn Windows Defender Firewall on or off** on the left.

3. Select **Turn off Windows Defender Firewall (not recommended)**.



**Figure 5-2 Windows Defender Firewall**

4. Click **OK**.

### 5.2.2 Set PC Network for Network Device

To ensure stable data transmission and normal communication between the PC and the device via client software, you need to set the PC network and make sure that they are in the same network segment.

#### Steps

---

##### Note

For different Windows versions, the specific setting path and interface may differ. Please refer to the actual condition.

---

1. Go to PC network settings page: **Start → Control Panel → Network and Internet → Network and Sharing Center → Change adapter settings.**
2. Select NIC and set the IP obtainment mode.
  - Select **Obtain an IP address automatically** to get an IP address of the PC automatically.
  - Or select **Use the following IP address** to set an IP address for the PC manually.

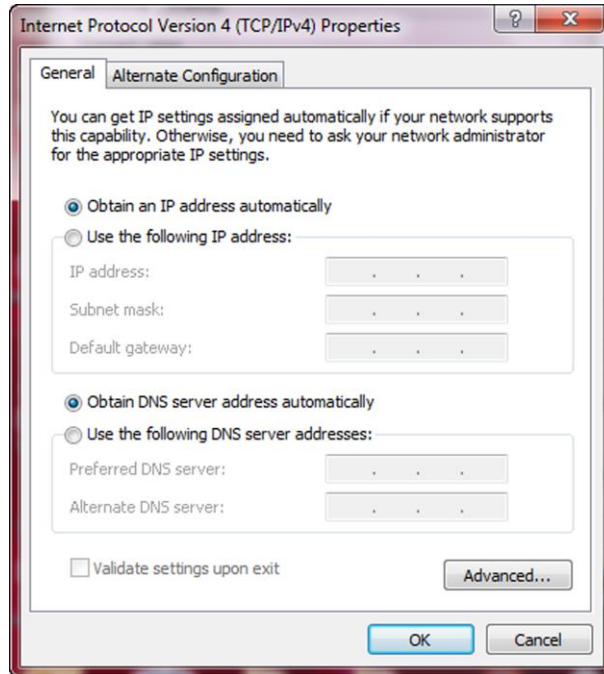


Figure 5-3 Set PC Network

### 5.2.3 Check USB Drive for USB Device

Checking the USB drive on the PC is required before using the USB device. After connecting the USB device to the PC, the Windows system will automatically detect a new hardware device and install its corresponding drive.

Go to **Device Manager** by either pressing Win+X or right-clicking on the Windows menu button, and locate and expand the **Network adapters** to check the drive.

---

#### Note


You can use the drive management tool to reinstall the USB drive if the installation is failed.

---

## 5.3 Set Device Network

You can set and operate the device in the client software only when the device is in the same network segment with the PC where the client software is installed.

### Steps

1. Double click the client software to run it.
2. Click  to find the device.
3. Right click the device to be connected.
4. Click **Modify IP**.
5. Set the IP address of the device in the same network segment with the PC.

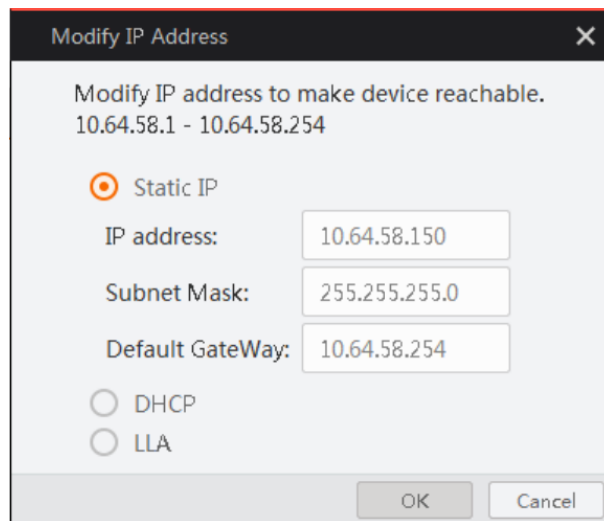


Figure 5-4 Modify IP Address

6. Click **OK**.

## 5.4 Connect Device to Client Software

Make sure your device IP address is in the same network segment with the PC where you installed the client software before connecting the device to it.

Double click the device in the device list, or click  to connect the device to the client.

## Chapter 6 Client Software Layout

After connecting to the device, the client software can read the device information and display it.

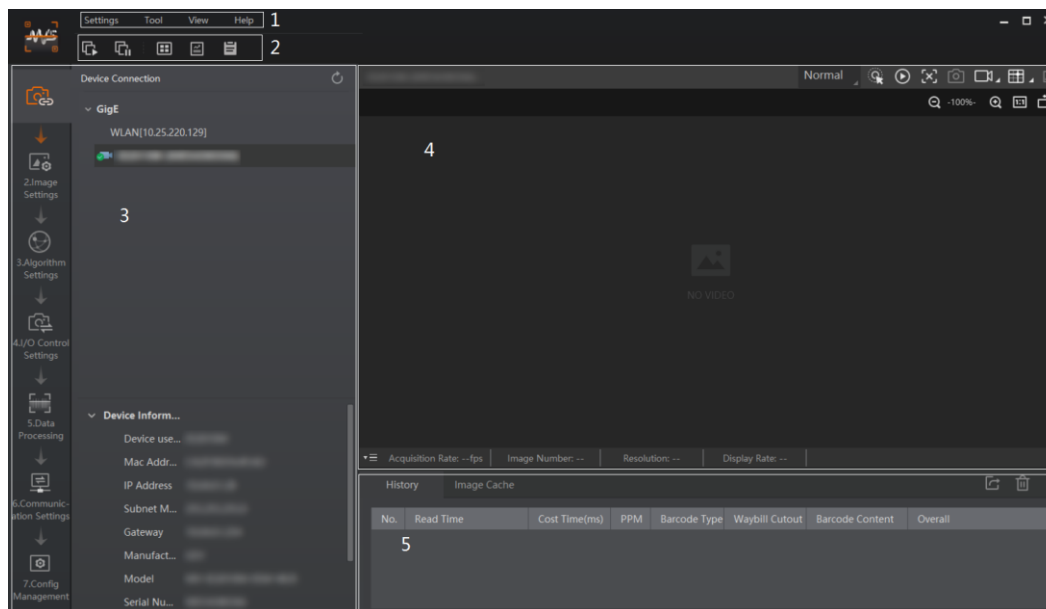


Figure 6-1 Main Window



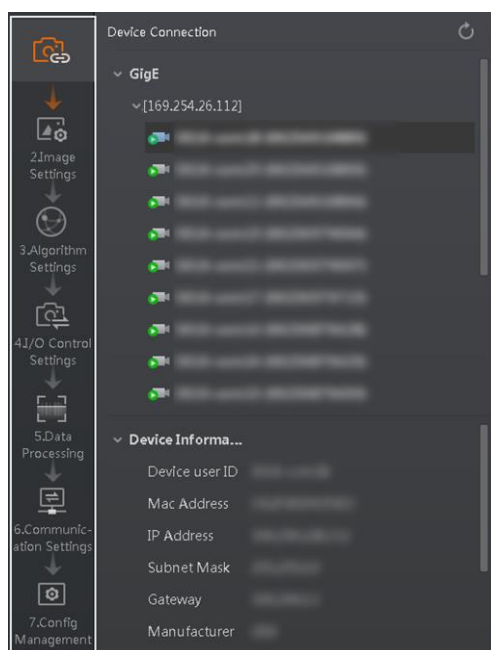
### Note

The specific interfaces of the client software may differ by its versions.

Table 6-1 Description of Main Window

No.	Name	Description
1	Menu Bar	The menu bar displays function modules, including <b>Settings</b> , <b>Tool</b> , <b>View</b> , and <b>Help</b> .
2	Control Toolbar	The control toolbar provides quick operations for the device. You can click different icons to start or stop batch acquisition, change window layout, view statistics information, and device log.
3	Device Configuration Area	You can connect or disconnect device, set parameters, and modify device IP address in this area.
4	Live View Window	This area displays the acquisition images and algorithm reading result in real-time. You can click different icons to capture and save image, record, etc.
5	History Record and Image Cache	This area displays different code information read by the device in real-time. You can also set image cache here.

You can set device parameters in device configuration area.



**Figure 6-2 Device Configuration Area**

**Table 6-2 Configuration Area Description**

No.	Module Name	Description
1	Device Connection	You can connect or disconnect device, modify device IP address, view device information, etc.
2	Image Settings	You can set image parameters, light parameters, etc.
3	Algorithm Settings	You can add different codes, set code number, etc.
4	I/O Control Settings	You can set parameters related with input and output.
5	Data Processing	You can set filter rule for output result.
6	Communication Settings	You can select different communication protocols, and set related parameters for output result.
7	Configuration Management	You can save and load user parameters, and restart the device.

## Chapter 7 Device Mode Settings

The device supports 3 types of operating modes, including **Test**, **Normal**, and **Raw**. You can select different modes in live view window according to actual demands.

### Note

- Stopping the real-time acquisition is required before selecting modes.
- You need to set device mode as **Normal** before specific device settings. Otherwise, the device parameters may be different.

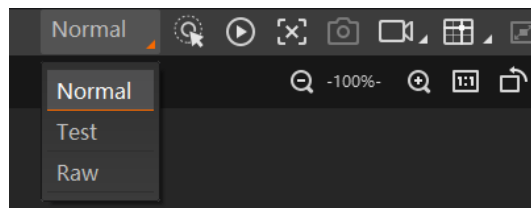


Figure 7-1 Select Device Mode

Table 7-1 Device Mode Description

Device Mode	Description
Test Mode	It is used during device debugging. The device outputs images that are acquired in real-time, and displays code information.
Normal Mode	It is used during device normal operation. After reading code in image, the device outputs image and code information.
Raw Mode	It is used during testing image data. The device outputs raw data and displays code information.


You can click  in the live view window to view images and the code reading effect. If the effect is not very good, you can adjust the focus knob (the vari focal device only) or related parameters like exposure time, gain, etc. in the **Image Settings** area.



Figure 7-2 Code Reading

## Chapter 8 Device Settings

You are recommended to complete device settings in following order: **Device Connection** → **Image Settings** → **Algorithm Settings** → **I/O Control Settings** → **Data Processing** → **Communication Settings** → **Configuration Management**.

---

### Note

Before specific device settings, you need to set device mode as Normal. Otherwise, the device parameters may be different. Regarding device mode, refer to **Device Mode Settings** for details.

---

- **Device Connection:** It tells you how to connect the device to the client software. And you can configure and operate the device remotely via the client software only when you have connected the device to the client software. Refer to **Connect Device to Client Software** for details.
- **Image Settings:** It tells you how to set image related parameters of the device via client software. Refer to **Image Quality Settings** for details.
- **Algorithm Settings:** It tells you how to set the types of code to be read, the 1D code algorithm, the 2D code algorithm, etc. Refer to **Code Algorithm Settings** for details.
- **I/O Control Settings:** It tells you how to set the parameters related to the control of input and output signals of device. Refer to **Signal Input Settings** and **Signal Output Settings** for details.
- **Data Processing:** It tells you how to set filter rules for reading codes and other data processing related parameters. Refer to **Code Reading Result Settings** for details.
- **Communication Settings:** It tells you how to select different communication protocols, and set their corresponding parameters. Refer to **Communication Settings** for details.
- **Configuration Management:** It tells you how to set and manage the user parameters, restart device, etc. Refer to **User Set Customization** for details.

## 8.1 Image Quality Settings

This section introduces how to set image related parameters of the device via client software.

---

### Note

For different models of the device, the specific parameters may differ, and the actual device you purchased shall prevail.

---

### 8.1.1 Set Image

You can set different image parameters like exposure time, gain, Gamma, acquisition frame rate,

acquisition burst frame count in image parameters interface.

---

### **Note**

- Make sure you have select the device to be set in Device Connection before setting image parameters.
  - For specific parameter range like exposure time, gain and acquisition frame rate, refer to the device's specification for details.
- 

### **Exposure Time**

You can increase exposure time to improve image brightness.

---

### **Note**

To some extent, increasing exposure time will reduce acquisition frame rate, and impact image quality.

---

### **Gain**

You can increase gain to improve image brightness.

---

### **Note**

To some extent, increasing gain will create more image noises, and impact image quality.

---

### **Gamma**

Gamma allows you to adjust the image contrast. It is recommended to reduce Gamma to increase brightness in dark background.

### **Acquisition Frame Rate**

Acquisition frame rate refers to the image number that is acquired by the device per second.

### **Acquisition Burst Frame Count**

Acquisition burst frame count refers to the outputted image number when the device is triggered once.

### **Polling Enable**

It enables the polling function, you can select off, single or multiple mode.

---

### **Note**

The parameter of polling enable will be displayed only when the trigger mode is on.

---

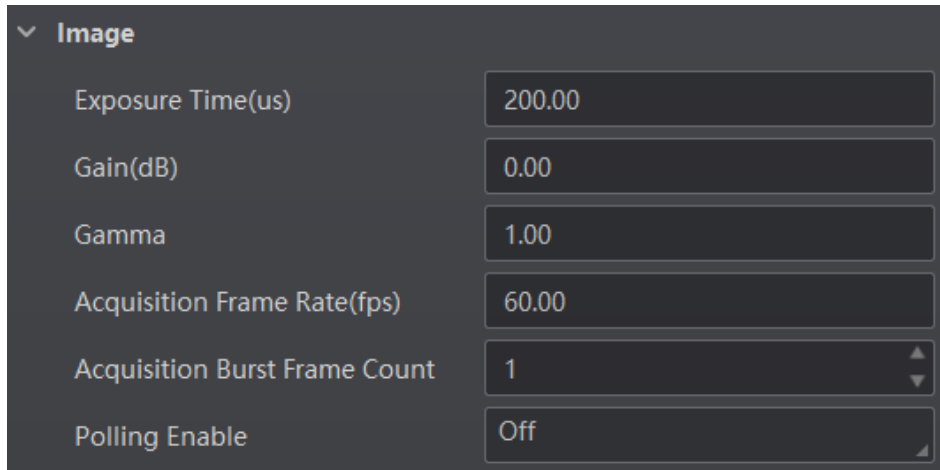


Image	
Exposure Time(us)	200.00
Gain(dB)	0.00
Gamma	1.00
Acquisition Frame Rate(fps)	60.00
Acquisition Burst Frame Count	1
Polling Enable	Off

Figure 8-1 Set Image

### 8.1.2 Set Polling

The polling function allows the device to acquire images based on the parameters you set, including exposure time, gain, Gamma, and light source. Currently, 2 types of polling modes are available, including single mode and multiple mode.

#### Single Mode

---

##### Note

- Stopping the real-time acquisition is required before setting the polling function.
  - After the polling enabled, the device acquires images with its max. frame rate. Once the polling disabled, the frame rate you set in **Acquisition Frame Rate** takes effect.
  - The polling function may differ by device models.
- 

#### Steps

1. Go to **Image Settings** → **Image** → **Polling Enable**, and select **Single** as **Polling Enable**.
2. Select one parameter (e.g. **Param1**) from **Polling Param**.
3. Set **Polling Exposure Time**, **Polling Gain**, and **Polling Gamma** according to actual demands.
4. Enable **Polling Light Enable** according to actual demands.

Acquisition Frame Rate(fps)	60.00
Acquisition Burst Frame Count	1
Polling Enable	Single
Polling Param	Param1
Polling Exposure Time	799.00
Polling Gain	0.00
Polling Gamma	1.00
Polling Light Enable	<input checked="" type="checkbox"/>

Figure 8-2 Single Mode

## Multiple Mode

---

### Note

- In multiple mode, the device supports trigger parameters like software trigger, external trigger, TCP, etc., does not support stopping polling via the external trigger.
  - The parameter of Best Polling Group Idx is used to display the polling parameter number when the device recognizes codes after enabling polling. If the polling is disabled or polling parameters are edited, it displays 1 by default.
  - The rule for multiple-mode polling is that the polling is started from the polling parameter with Best Polling Group Idx, and then execute other polling parameters you selected in turn. For example, if the Param3 is the Best Polling Group Idx and Param1, Param2, Param4 and Param5 are enabled, the polling order is Param3 > Param1 > Param2 > Param4 > Param5.
- 

### Steps

1. Go to **Image Settings** → **Image** → **Polling Enable**, and select **Multiple** as **Polling Enable**.
2. Set **Polling Time** and **Polling Period** according to actual demands.
3. Select 2 to 8 sets of parameters (e.g. **Param1** and **Param2**) from **Polling Param**, and enable **Polling Param Enable** to let them take effect.
4. Set **Polling Exposure Time**, **Polling Gain**, and **Polling Gamma** for the **Polling Param** you selected.
5. Enable **Polling Light Enable** according to actual demands.
6. Repeat step 3 to step 5 to set other parameters from **Polling Param**.

Acquisition Frame Rate(fps)	60.00
Acquisition Burst Frame Count	1
Polling Enable	Multiple
Polling State	0
Polling Time	100
Polling Period	1
Best Polling Group Idx	1
Polling Param	Param5
Polling Param Enable	<input checked="" type="checkbox"/>
Polling Exposure Time	799.00
Polling Gain	0.00
Polling Gamma	1.00
Polling Light Enable	<input checked="" type="checkbox"/>

Figure 8-3 Multiple Mode

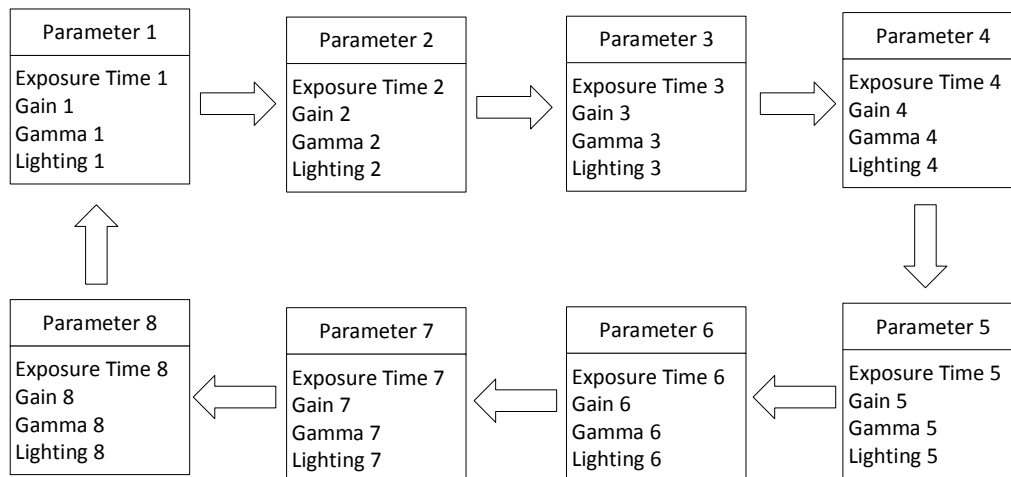


Figure 8-4 Polling Diagram

### 8.1.3 Set Light Source

Light source control allows you to enable the device's aiming system and light source, and set related parameters according to actual demands.

#### Note

- Light source parameters may differ by device models.
- Make sure you have select the device to be set in **Device Connection** before setting light source parameters.

Go to **Image Settings** → **Light**, and enable **Aiming Light Enable** to enable the device's aiming light. You can also enable **Lighting Enable** to enable the device's light source, and set **Lighting Duration** and **Lighting Ahead Time** according to actual demands.

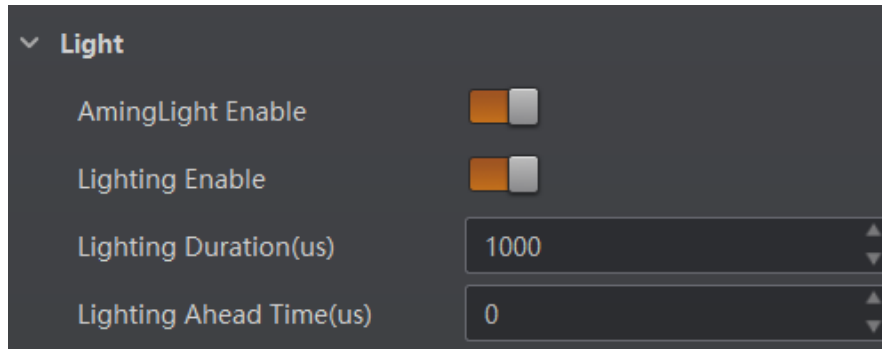


Figure 8-5 Set Light Source

### 8.1.4 Set Self-Adaptive Adjustment

The function of self-adaptive adjustment can automatically adjust exposure, gain, Gamma and other parameters to have a better code reading effect.

#### Steps

1. Go to **Image Settings** → **Self Adapt Adjust**, and select **Adjust Mode**.
  - High Quality: In this mode, the client software will adjust exposure in priority with small gain and noise. The image quality is high, and this mode is applicable to the scenario for low speed conveyer belt.
  - High Speed: In this mode, the client software will adjust gain in priority with small exposure and large gain. The image quality is less high, and this mode is applicable to the scenario for high speed conveyer belt.
2. Select **Param Source** according to actual demands.
  - Default Param: It adjusts the default parameters.
  - Polling Param: It adjusts parameters configured in polling, and you can select from **Polling Param**.
3. Enable or disable **Lighting Enable** during self adaptive adjustment.
5. (Optional) Set **Gain Max** and **Adjust Timeout** according to actual demands.
  - Gain Max: It is the max. gain during self adaptive adjustment.
  - Adjust Timeout: It sets the duration of the self adaptive adjustment.
6. Click **Execute** in **Adjust Start**. The device will automatically acquire images and perform self adaptive adjustment, and stop acquisition after adjustment is completed.

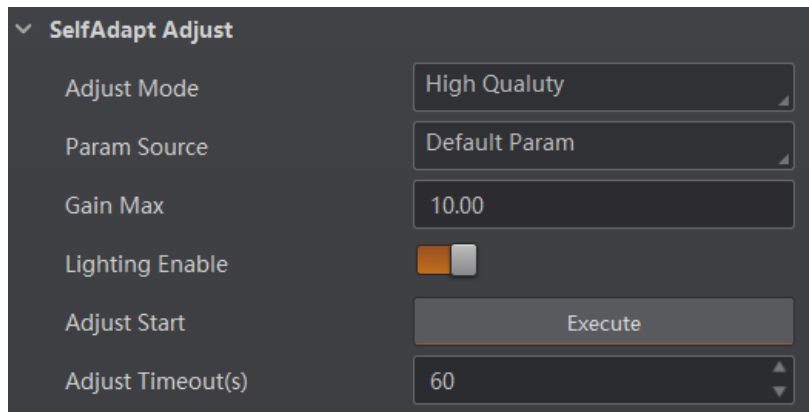


Figure 8-6 Set Self-Adaptive Adjustment

### 8.1.5 Set Mirror X

The device supports the mirror X function. If this function is enabled, the image will be reversed in a horizontal way.

Go to **Image Settings**, click **All Features** to display other features, and set **Mirror X** according to actual demands.

---

#### Note

This function is enabled by default, and it may differ by device models.

---

### 8.1.6 Set Test Pattern

Test pattern helps troubleshooting image problems and images in the test pattern are only for test. When exceptions occur in images acquired by the device in real time, you can check if images in the test pattern have similar problems to determine the cause of an exception.

---

#### Note

- The test pattern is available in the test or raw device mode.
  - Specific parameters of this function may differ by device models.
- 

Go to **Image Settings**, click **All Features**, find **Test Pattern** in **Other Features**, and set **Test Pattern** according to actual demands.

## 8.2 Code Algorithm Settings

The code reader supports reading multiple types of 1D code and 2D code, and you can add and set

code parameters via the client software.

### 8.2.1 Add Code

Adding code before you set code parameters via the client software. In **Algorithm Settings**, you can add different types of codes according to actual demands.

In **Algorithm Settings**, click **Add Barcode**, select the types of codes to be read, and set the **1D Code Number** and **2D Code Number** according to actual demands.

---

#### Note

- For different models of the device, the specific parameters may differ, and the actual device you purchased shall prevail.
  - Selected symbology amount and added code amount may affect the code recognition time. Note that selecting more symbologies or adding more codes may consume more time to recognize codes in the image.
  - No matter 1D code or 2D code, up to 20 codes can be added at a time. Note that adding more codes may consume more time to recognize codes in the image. Therefore, the code number is recommended to be set according to the actual demands.
  - The code reader may output actual code number when the mismatch between the actual code number and the code number set in the client software occurs.
- 



Figure 8-7 Add Codes

## 8.2.2 Set Code Reading ROI

Algorithm ROI (Region of Interest) allows the device to execute algorithms and read codes on the specific area you selected, and thus improving code reading efficiency.

Currently, up to 4 ROIs can be configured, and the device outputs codes according to the number of ROI (e.g. Region 1, Region 2, and Region 3) in turn. You can draw single group of ROI or multiple ROIs according to actual demands.

---

### Note

- If no code is recognized in the algorithm ROI, and the device will output “noread”.
  - If no algorithm ROI is enabled, and the full screen is the algorithm ROI by default.
  - This function may differ by device models.
- 

## Draw Single Group of ROI

### Steps

1. Go to **Algorithm Settings**, click **All Features**, and find **Algorithm ROI**.
2. Select ROI from **ROI Selector**.
3. Click **Draw** to draw ROI in the live view window, or set **Draw ROI Width**, **Draw ROI Height**, **Draw ROI Offset X** and **Draw ROI Offset Y** according to actual demands.
  - Draw ROI Width: It refers to the width in algorithm ROI.
  - Draw ROI Height: It refers to the height in algorithm ROI.
  - Draw ROI Offset X: It refers to the X coordinate of the upper left corner in algorithm ROI.
  - Draw ROI Offset Y: It refers to the Y coordinate of the upper left corner in algorithm ROI.
4. Repeat steps above to draw multiple ROIs according to actual demands.
5. (Optional) Click **Execute** in **Restore Max. Algorithm ROI** to restore the ROI to the full screen.
6. (Optional) Click **Execute** in **Clear All ROI** to delete all ROIs.

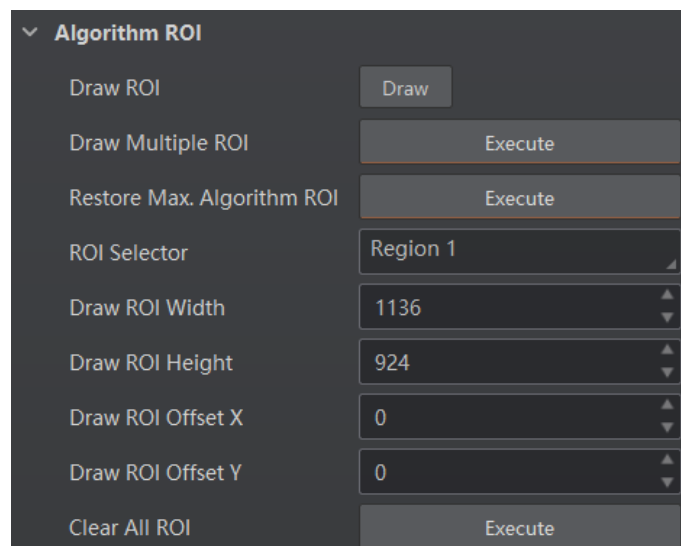


Figure 8-8 Draw Single Group of ROI

## Draw Multiple ROIs

### Steps

1. Go to **Algorithm Settings**, click **All Features**, and find **Algorithm ROI**.
2. Click **Execute** in **Draw Multiple ROI**.
3. Enter number, horizontal spacing and vertical spacing in the prompted window.
4. Click **OK**.

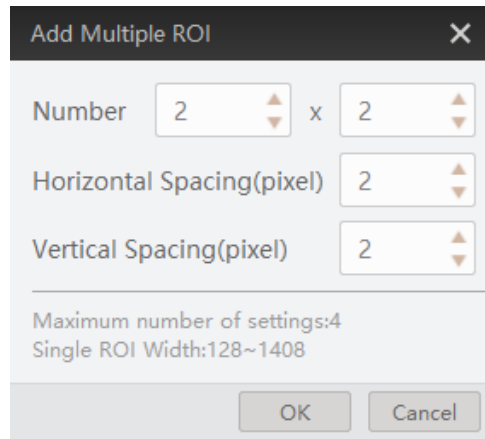


Figure 8-9 Add Multiple ROIs

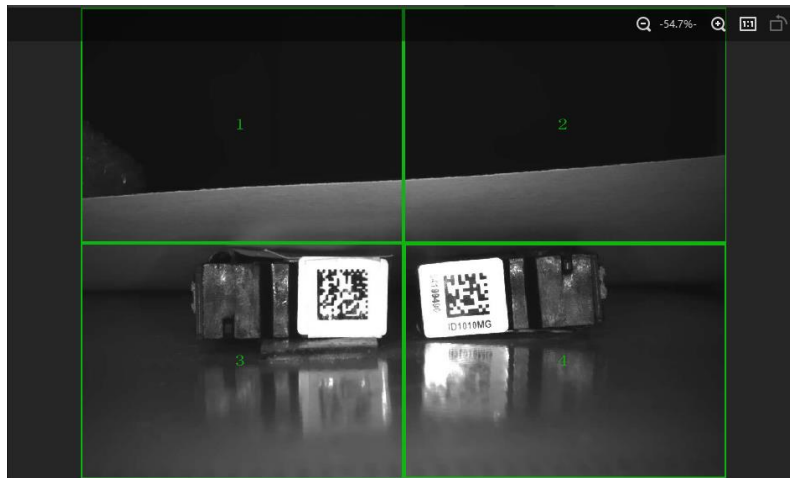


Figure 8-10 Multiple ROIs

### 8.2.3 Set 1D Algorithm Parameter

Click **All Features** on the upper-right to display all algorithm parameters. In the **Algorithm Parameter** page, select **1DCode** as **Arithmetic Type**, and then you can set its corresponding parameters.

 **Note**

- You should have selected at least one type of 1D code.
  - For different models of the device, the specific parameters may differ, and the actual device you purchased shall prevail.
- 

**Timeout Value**

Timeout value refers to the maximum running time of algorithm, and its unit is ms. The code reader will stop parsing the images and return results if the time is exceeded the waiting time configured.

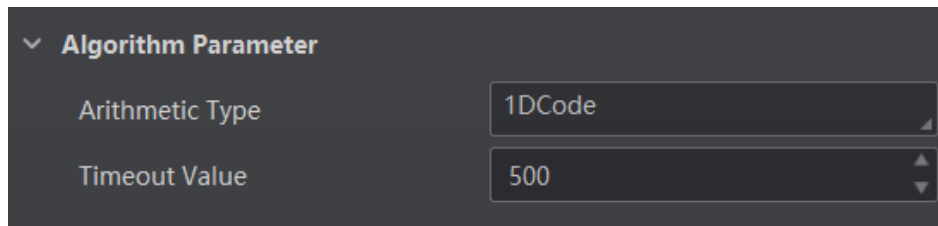


Figure 8-11 Set 1D Algorithm Parameter

## 8.2.4 Set 2D Algorithm Parameter

Click **All Features** on the upper-right to display all algorithm parameters. In the **Algorithm Parameter** page, select **2D Code** as **Arithmetic Type**, and then you can set its corresponding parameters.

---

 **Note**

- You should have selected at least one type of 2D code.
  - For different models of the device, the specific parameters may differ, and the actual device you purchased shall prevail.
- 

**Timeout Value**

Timeout value refers to the maximum running time of algorithm, and its unit is ms. The code reader will stop parsing the images and return results if the time is exceeded the waiting time configured.

**Algorithm Running Mode**

It is used to be set the algorithm operating mode. It includes **High Speed**, **High Performance**, and **Balance**. **High Speed** focuses on recognition speed, and the algorithm can recognize the code rapidly, while **High Performance** refers to the algorithm can recognize the code that has distortion, spot or white gap, but its recognition speed is slow. **Balance** refers to the algorithm makes a balance between speed and performance.

**2D Code Max. Size**

It refers to the max. recognizable code width. The 2D code will not be recognized if its width

exceeds the configured value.

### Mirror Mode

It is useful when the recognized image is a mirror one, mirroring in X coordinate. 3 modes are available: **Adaptive**, **Mirror**, and **Non Mirror**.

### Downsampling Level

It refers to the pixel sample size that the code reader takes. Increasing this parameter will improve the code reading efficiency at the expense of code recognition rate.

---

#### Note

Increasing this parameter value will improve the code reading efficiency at the cost of code recognition rate.

---

### Code Color

It defines the readable code color. **Adaptive** means that the client software can recognize both the black code with white background, and the white code with black background. **White Code On Black Wall** means that the client software can recognize the white code with black background. **Black Code On White Wall** means that the client software can recognize the black code with white background.

---

#### Note



- For QR code, the code color is determined by the color of the concentric square on it.  indicates that the code color is white, and  indicates that the code color is black.



Figure 8-12 White QR Code



Figure 8-13 Black QR Code

- For DM code, the code color is determined by the color of its "L" shaped sides. White "L"

shaped sides indicate that the code color is white, and black "L" shaped sides indicate that the code color is black.





Figure 8-14 White DM Code





Figure 8-15 Black DM Code

---

### Discrete Flag

**Continuous** stands for the minimum units in the "L" shaped sides of the DM code are continuous, or the minimum units in the concentric square like  or  in the QR code are continuous. Usually the continuous code uses squares as the minimum units.

**Discrete** stands for the minimum units in the "L" shaped sides of the DM code are discrete, or the minimum units in the concentric square like  or  in the QR code are discrete. Usually the discrete code uses dots as the minimum units.

**Adaptive** stands for the device can recognize both continuous code and the discrete code.

### QR Distortion Correction

If the QR code or DM code is distorted, you can enable this parameter to improve code recognition rate.

---

#### Note

If you enable this parameter, the more time will be consumed to recognize the codes in the image.

---

### Advance Param

This parameter is applicable to some special codes, and it is recommended to use the default value.

### DM Code Shape

It defines the recognizable code shape. **Square** stands for square mode: If the 2D code is square

shaped, it can be recognized by the device. **Rectangle** stands for rectangle mode: If the 2D code is rectangle shaped, it can be recognized by the device. **Adaptive** stands for compatible mode: The device can recognize 2D codes of both the above-mentioned two shapes.

### Code Quality Evaluation Enable

If it is enabled, the device will evaluate code quality and display overall grade and code score in history record area of the client software. The higher the score, and the better the code quality.

---

#### Note

Currently, the code quantity evaluation function is only applicable to Data Matrix code.

---

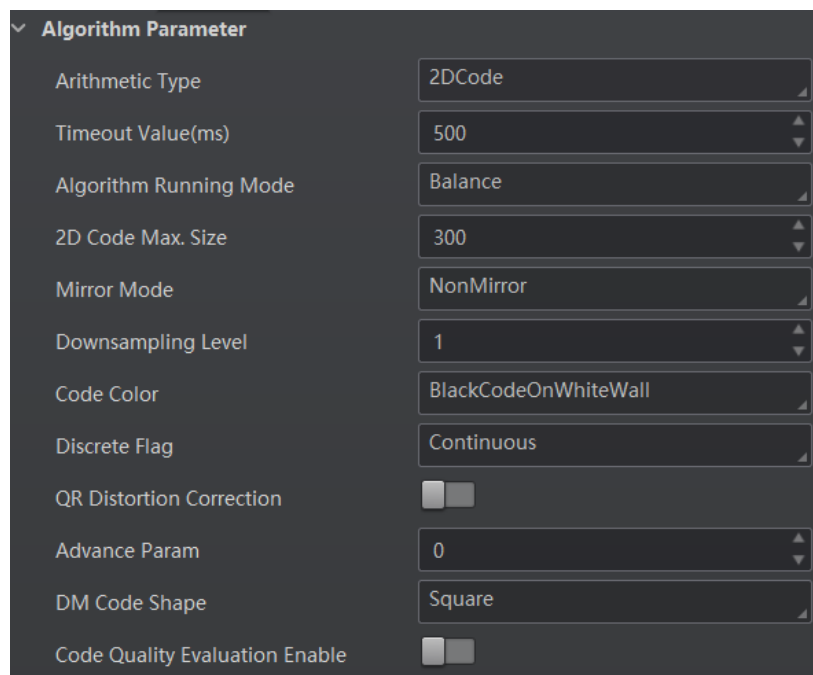


Figure 8-16 Set 2D Algorithm Parameter

## 8.2.5 Set Code Quality Evaluation

After **Code Quality Evaluation Enable**, you can set specific parameters according to actual demands.

---

#### Note

- The function of code quality evaluation may differ by device models.
  - In test mode, this function is enabled by default. In normal mode, you need to enable it manually.
-

## Steps

1. Set **Sym Proc Type** according to actual type, and the default value is **Type 1**.
2. Set **Iso Edition**, including Iso15415 and Iso29158.
  - Iso15415 is applicable to the quality evaluation for continuous codes.
  - Iso29158 is applicable to the quality evaluation for dot codes.

### Note

If type 2 is selected as **Sym Proc Type**, and **Iso Edition** supports Iso15415 only.

3. Set **Verify Edition**, including standard mode and HIK mode.
  - Standard mode is a standard quality evaluation mode.
  - HIK mode is a professional quality evaluation mode.


### Note

If type 2 is selected as **Sym Proc Type**, and **Verify Edition** supports standard mode only.

4. Set **Standard Aperture** and **Magnification**.
  - Standard aperture refers to a standard aperture, and its default value is 400.
  - Magnification is 150 by default.

### Note

**Standard Aperture** and **Magnification** should be configured only when type 2 is selected as **Sym Proc Type**.

5. Click  to start acquisition, and the client software will display the overall code quality in the history area.

History		Image Cache						
No.	Read Time	Cost Time(ms)	PPM	Barcode Type	Waybil	Barcode Content	Overall Grac	Code Score
5	2021/1/25 15:02:31-274	301	7.4	DataMatrix		D78005765	F	26
4	2021/1/25 15:02:31-274	301	6	DataMatrix		number: 1,datamatrix	F	21
3	2021/1/25 15:02:29-191	170	7.5	DataMatrix		D78005765	F	25

Figure 8-17 Code Quality Evaluation

6. (Optional) Click specific grade in the overall grade list to view different quantity evaluation items.

## 8.2.6 Set Code Score

After enabling code score function, the client software can output specific score for codes it has read.

### Note

- The function of code score may differ by device models.
- In test mode, this function is enabled by default. In normal mode, you need to enable it manually.

### Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to **Algorithm Control**, and enable **Code Score Enable**.

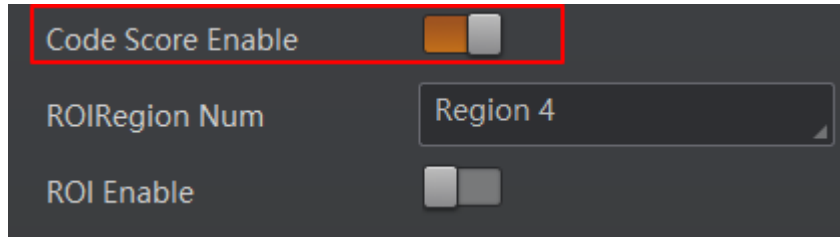



Figure 8-18 Enable Code Score

3. Click  to start acquisition, and the client software will display specific code score in the history area.

History		Image Cache						
No.	Read Time	Cost Time(ms)	PPM	Barcode Type	Waybil	Barcode Content	Overall Grac	Code Score
5	2021/1/25 15:02:31:274	301	7.4	DataMatrix		D78005765	F	26
4	2021/1/25 15:02:31:274	301	6	DataMatrix		number: 1,datamatrix	F	21
3	2021/1/25 15:02:29:191	170	7.5	DataMatrix		D78005765	F	25

Figure 8-19 Code Score

## 8.3 Line Mode Settings

Line mode settings allows you to customize the specific line as input or output according to actual demands. Line 0 should be same with Line 1 as input or output, and Line 2 should be same with Line 3 as input or output.

Go to **I/O Control Settings** → **Line Mode Control**, and set **Input** or **Output** according to actual demands.

### Note

- Only the vari focal device supports this function.
- By default, Line 0 and Line 1 are input, and Line 2 and Line 3 are output.

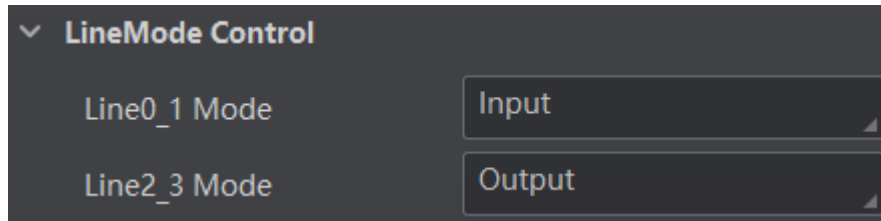


Figure 8-20 Set Line Mode

## 8.4 Signal Input Settings

In the signal input module, you can set the trigger related parameters. You can enable trigger mode to let the acquisition of image data occur only when the trigger source is generated.

### 8.4.1 Set Trigger Mode

The device has 2 types of trigger mode: Internal trigger mode and external trigger mode.

#### Internal Trigger Mode

In this mode, the device acquires images via its internal signals.

#### External Trigger Mode

In this mode, the device acquires images via external signals like software signal and hardware signal. The trigger source of external trigger mode includes software, physical lines, counter, TCP start, UDP start, serial start, and USB start.


---

#### Note

- The USB device supports two trigger sources (USB stat and software) only, and the network device supports all trigger sources apart from USB stat.
  - For specific trigger sources, refer to the actual device you got.
  - The device trigger via pressing button on it is supported by default. You can go to **Feature Tree** → **Trigger and IO Control** → **TRIG Button Enable** to disable it.
- 

### 8.4.2 Enable Internal Trigger Mode


In the internal trigger mode, the device acquires images via its internal signals. You have 2 methods to enable the internal trigger mode:

- Click **I/O Control Settings** → **Input** → **Trigger Mode**, and select **Off** as **Trigger Mode**.
- In the live view page, click  to enable the internal trigger mode.

### 8.4.3 Enable External Trigger Mode

In the external trigger mode, the device acquires images via external signals like software signal

and hardware signal. You have 2 methods to enable the external trigger mode:

- Click **I/O Control Settings** → **Input** → **Trigger Mode**, and select **On** as **Trigger Mode**.
- In the live view page, click  to enable the external trigger mode.

## Set and Execute Software Trigger Mode

In software trigger, the software sends trigger signal to the device via I/O interface to acquire images.

### Steps

1. Click **I/O Control Settings** → **Input** → **Trigger Mode**.
2. Select **On** as **Trigger Mode**.
3. Select **Software** as **Trigger Source**.
4. Click **Execute** in **Trigger Source** to send trigger commands.

You can also enter **Auto Trigger Time**, and then enable **Enable Auto Trigger** to let the client software automatically send trigger signal to device according to the interval you set.

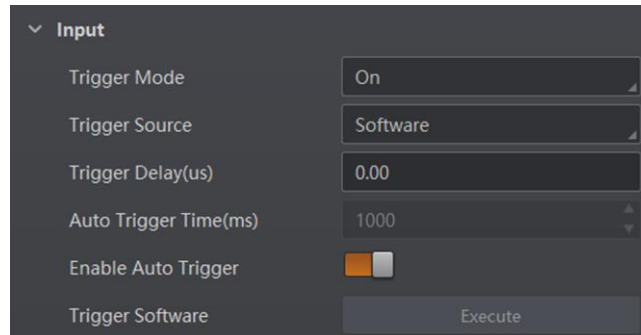


Figure 8-21 Set and Execute Software Trigger Mode

## Set and Execute Hardware Trigger Mode

### Steps

1. Click **I/O Control Settings** → **Input** → **Trigger Mode**.
2. Select **On** as **Trigger Mode**.
3. Select the specific line as **Trigger Source** according to actual demands.

---

### Note

For the vari focal device, you can select customized lines as **Trigger Source**. Refer to section **Line Mode Settings** for specific settings.

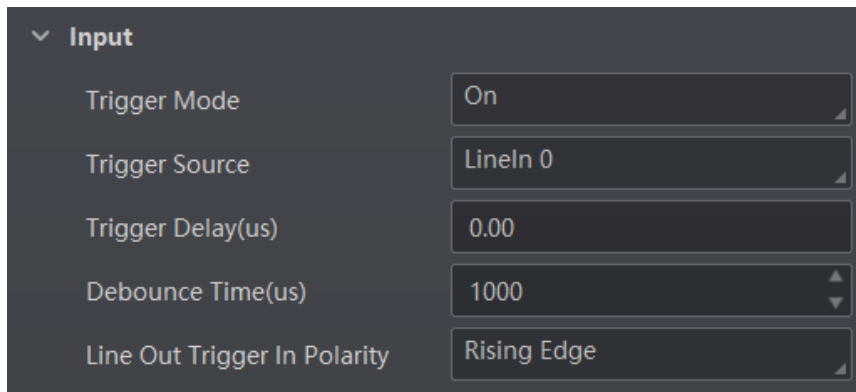
---

4. Set **Debounce Time** and **Line Out Trigger In Polarity** according to actual demands.
- 

### Note

- When selecting **Rising Edge** or **Falling Edge** as **Line Out Trigger In Polarity**, you can set **Trigger Delay**.

- When selecting **Level High** or **Level Low** as **Line Out Trigger In Polarity**, you can set **Start Delay Time** and **End Delay Time** according to actual demands.
- 



The screenshot shows a settings menu with a dropdown arrow and the label 'Input'. Below it are five configuration items, each with a label and a value in a box with a small arrow on the right:

Label	Value
Trigger Mode	On
Trigger Source	LineIn 0
Trigger Delay(us)	0.00
Debounce Time(us)	1000
Line Out Trigger In Polarity	Rising Edge

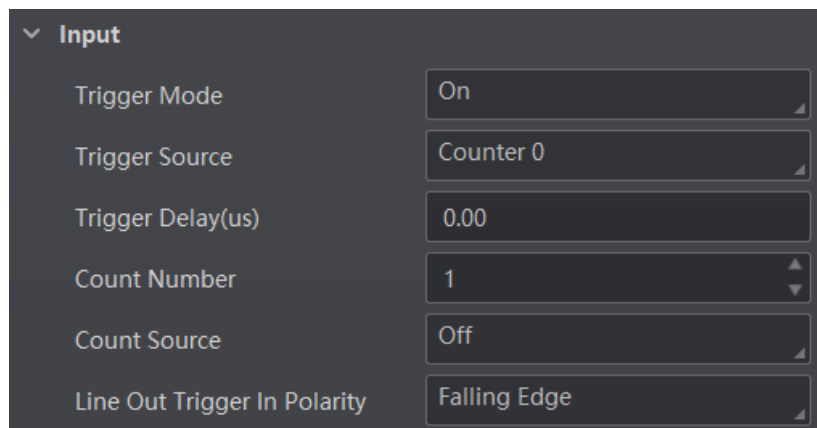
Figure 8-22 Set and Execute Hardware Trigger Mode

### Set and Execute Counter Trigger Mode

Counter specifies that the trigger source will be generated after the set number of valid signals appears. For example, if you set the **Count Number** to **3**, the trigger source will be generated after 3 signals appear.

#### Steps

1. Click **I/O Control Settings** → **Input** → **Trigger Mode**.
2. Select **On** as **Trigger Mode**.
3. Select **Counter 0** as **Trigger Source**.
4. Set **Trigger Delay**, **Count Number**, **Count Source** and **Line Out Trigger In Polarity** according to actual demands.



The screenshot shows a settings menu with a dropdown arrow and the label 'Input'. Below it are six configuration items, each with a label and a value in a box with a small arrow on the right:

Label	Value
Trigger Mode	On
Trigger Source	Counter 0
Trigger Delay(us)	0.00
Count Number	1
Count Source	Off
Line Out Trigger In Polarity	Falling Edge

Figure 8-23 Set and Execute Counter Trigger Mode

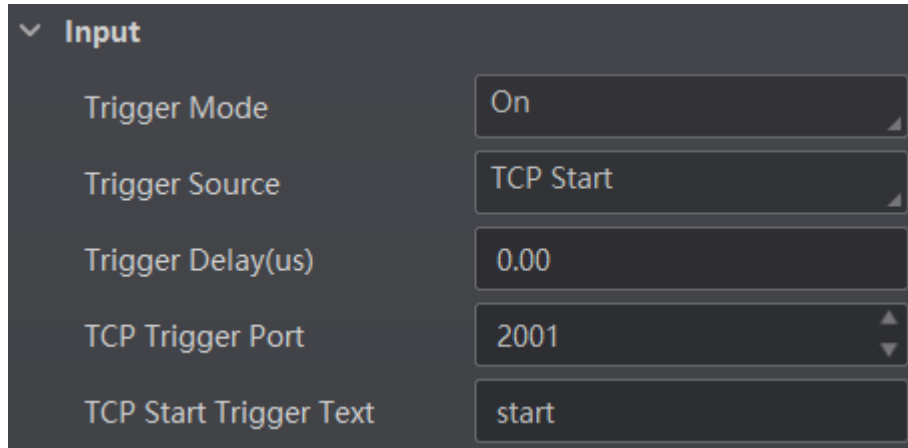
### Set and Execute TCP Trigger Mode

TCP start specifies the TCP server as the source for the trigger signal. When the server receives the

specified string text, the trigger signal will be outputted.

Click **I/O Control Settings** → **Input** → **Trigger Mode**, select **On** as **Trigger Mode** and select **TCP Start** as **Trigger Source**.

Set **Trigger Delay**, **TCP Trigger Port**, and **TCP Start Trigger Text** according to actual demands.



The screenshot shows a settings menu with a dropdown arrow and the label 'Input'. It contains five rows of settings:

Setting	Value
Trigger Mode	On
Trigger Source	TCP Start
Trigger Delay(us)	0.00
TCP Trigger Port	2001
TCP Start Trigger Text	start

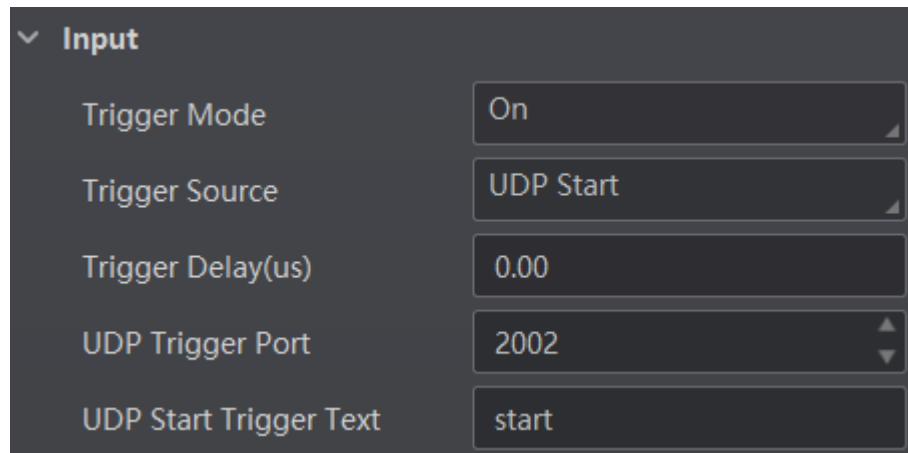
Figure 8-24 Set and Execute TCP Trigger Mode

### Set and Execute UDP Trigger Mode

UDP start specifies the UDP server as the source for the trigger signal. When the server receives the specified string text, the trigger signal will be outputted.

Click **I/O Control Settings** → **Input** → **Trigger Mode**, select **On** as **Trigger Mode** and select **UDP Start** as **Trigger Source**.

Set **Trigger Delay**, **UDP Trigger Port**, and **UDP Start Trigger Text** according to actual demands.



The screenshot shows a settings menu with a dropdown arrow and the label 'Input'. It contains five rows of settings:

Setting	Value
Trigger Mode	On
Trigger Source	UDP Start
Trigger Delay(us)	0.00
UDP Trigger Port	2002
UDP Start Trigger Text	start

Figure 8-25 Set and Execute UDP Trigger Mode

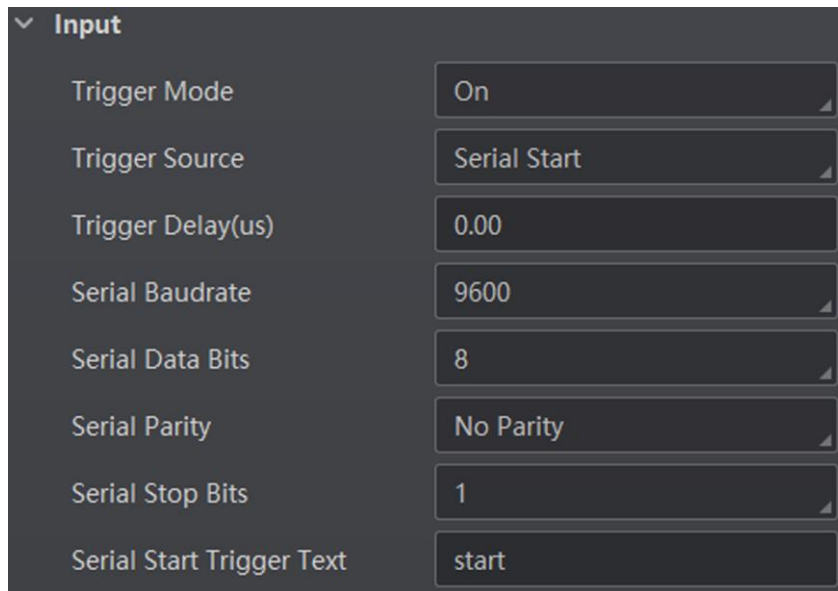
### Set and Execute Serial Port Trigger Mode

Serial start specifies the serial port as the source for the trigger signal. When the serial port

receives the specified string text, the trigger signal will be outputted.

Click **I/O Control Settings** → **Input** → **Trigger Mode**, select **On** as **Trigger Mode** and select **Serial Start** as **Trigger Source**.

Set **Trigger Delay**, **Serial Baudrate**, **Serial Data Bits**, **Serial Parity**, **Serial Stop Bits**, and **Serial Start Trigger Text** according to actual demands.

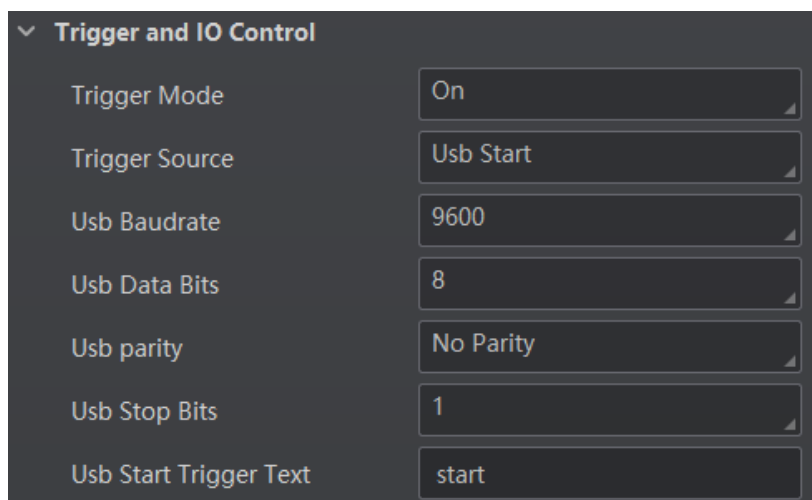


Trigger Mode	On
Trigger Source	Serial Start
Trigger Delay(us)	0.00
Serial Baudrate	9600
Serial Data Bits	8
Serial Parity	No Parity
Serial Stop Bits	1
Serial Start Trigger Text	start

Figure 8-26 Set and Execute Serial Port Trigger Mode

## Set and Execute USB Trigger Mode

If **USB Start** is selected as **Trigger Source**, you need to set **USB Baudrate**, **USB Data Bits**, **USB Parity**, **USB Stop Bits**, and **USB Start Trigger Text** according to actual demands.



Trigger Mode	On
Trigger Source	Usb Start
Usb Baudrate	9600
Usb Data Bits	8
Usb parity	No Parity
Usb Stop Bits	1
Usb Start Trigger Text	start

Figure 8-27 Set and Execute USB Trigger Mode

 **Note**

You need to go to **Feature Tree**, find **Trigger IO Control**, and set **USB Start** as **Trigger Source**.

---

### 8.4.4 Stop Trigger

The device supports stopping trigger via TCP, UDP, I/O, serial port and USB. You can also set code reading timeout duration or max. code amount to be read to stop trigger. After stopping trigger is completed, the device cannot make response to trigger again.

---

 **Note**

- The USB device supports stopping trigger via USB only, and the network device supports all stop trigger methods apart from USB method.
  - For specific stop trigger methods, refer to the actual device you got.
- 

#### Stop Trigger via TCP

When the TCP server receives the specified string text, the trigger will be stopped.

Click **I/O Control Settings** → **Stop Trigger**, enable **Tcp Stop Trigger Enable**, set **Tcp Trigger Port** and **Tcp Stop Trigger Text** according to actual demands.

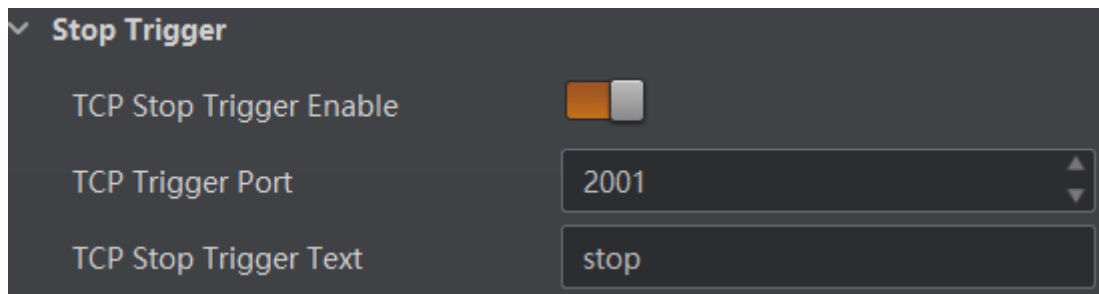


Figure 8-28 Stop Trigger via TCP

#### Stop Trigger via UDP

When the UDP server receives the specified string text, the trigger will be stopped.

Click **I/O Control Settings** → **Stop Trigger**, enable **Udp Stop Trigger Enable**, set **Udp Trigger Port** and **Udp Stop Trigger Text** according to actual demands.

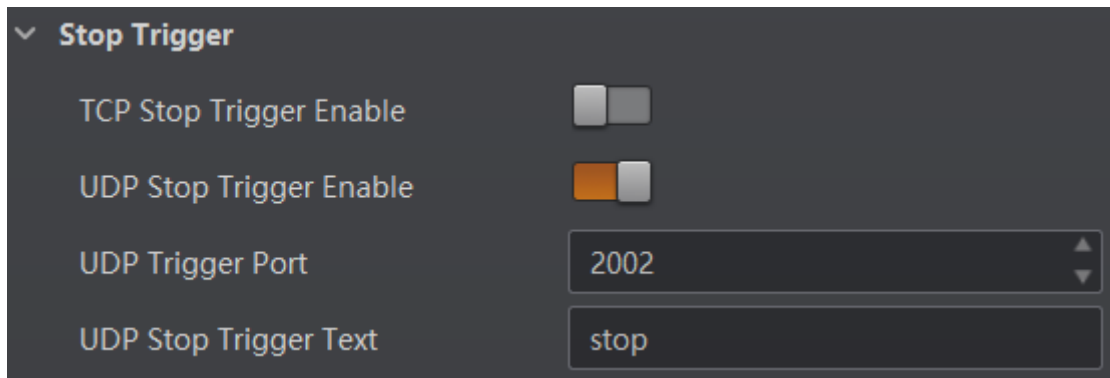


Figure 8-29 Stop Trigger via UDP

### Stop Trigger via IO

You can stop a trigger via IO: Enabling **IO Stop Trigger Enable** first, select specific sources from **IO Stop Trigger Selector**, and then set the trigger polarity as the condition to stop trigger.

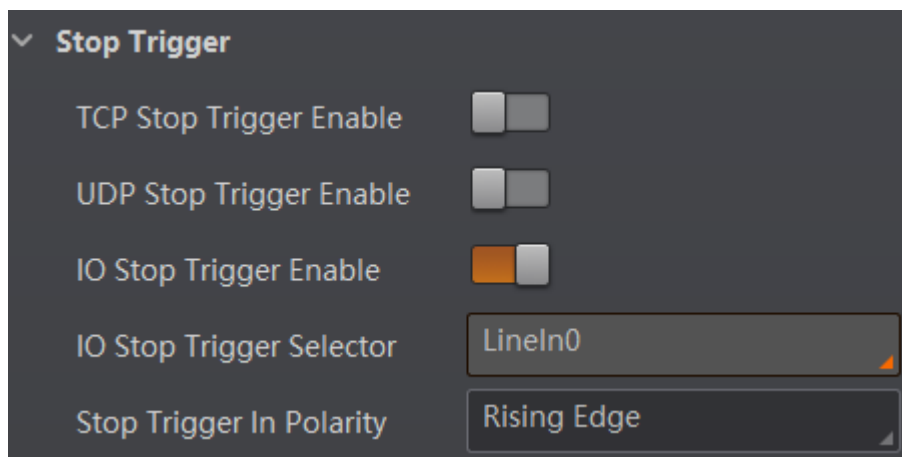


Figure 8-30 Stop Trigger via IO

When selecting **SoftwareTriggerEnd** as **IO Stop Trigger Selector**, you can click **Execute** in **Software Stop Trigger** to stop current trigger.

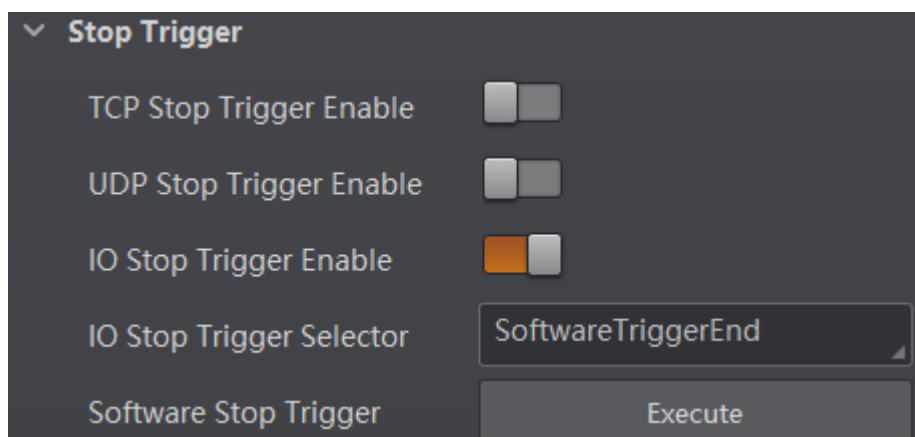


Figure 8-31 Software Trigger End

### Stop Trigger via Serial Port

When the specified serial port receives the specified string text, the trigger will be stopped. Click **I/O Control Settings** → **Stop Trigger**, enable **Serial Stop Trigger Enable**, set **Serial Stop Trigger Text**, **Serial Baud Rate**, **Serial Data Bits**, **Serial parity**, and **Serial Stop Bits** according to actual demands.

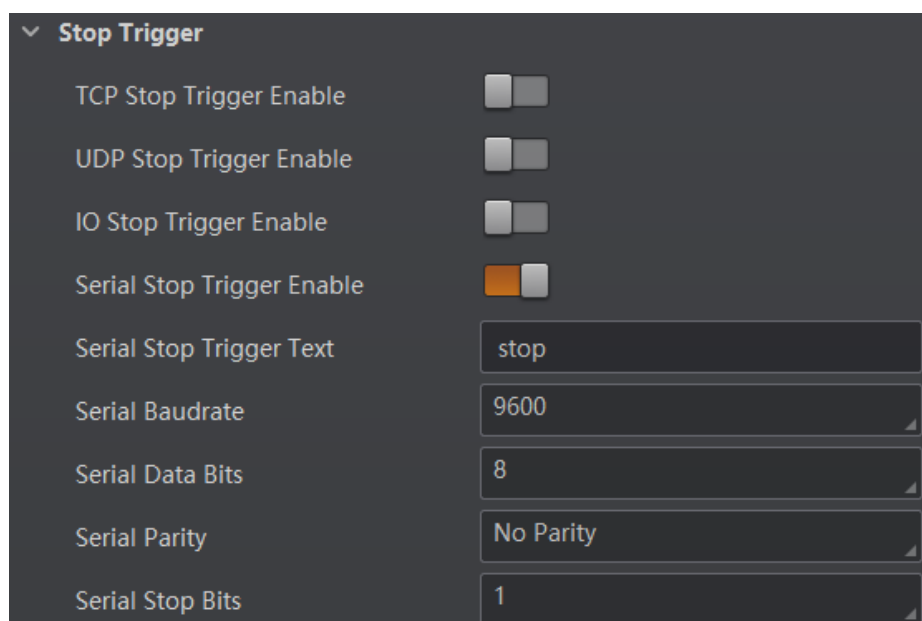


Figure 8-32 Stop Trigger via Serial Port

### Stop Trigger via USB

The USB stop trigger function means that the device receives USB commands from the external device to stop image acquisition. At this time, the device acts as a USB server to receive commands, and the external device communicating with it acts as a USB client to send commands.

Go to **Feature Tree**, find **Stop Trigger Control**, enable **USB Stop Trigger Enable**, set **USB Stop Trigger Text**, **USB Baudrate**, **USB Data Bits**, **USB Parity**, and **USB Stop Bits** according to actual demands.

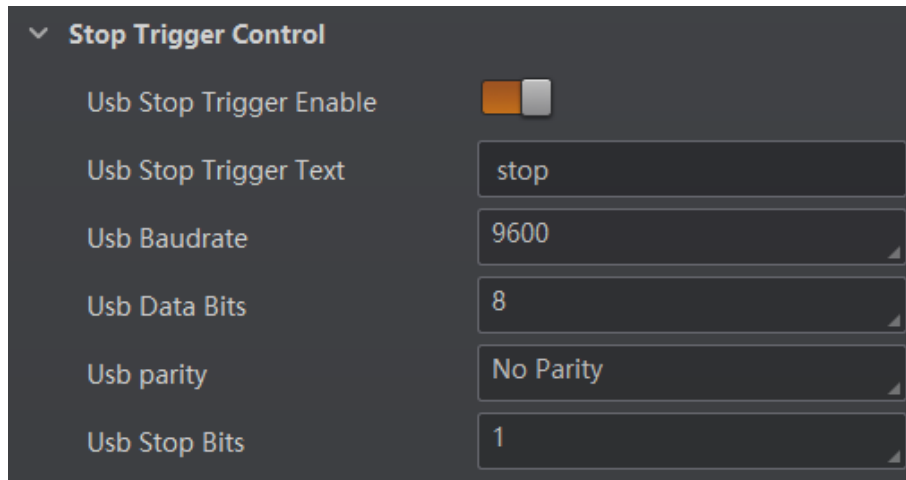


Figure 8-33 Stop Trigger via USB

## Stop Trigger via Timeout Duration

---

### Note

**TimeOut Stop Trigger Enable** is only available when the camera mode is set to **Normal** and the **Trigger Mode** is **On**.

---

When the trigger time reaches the specified maximum value (in ms), the trigger will be stopped. You can enable **TimeOut Stop Trigger Enable**, and set **Maximum Output Limited Time** according to actual demands.

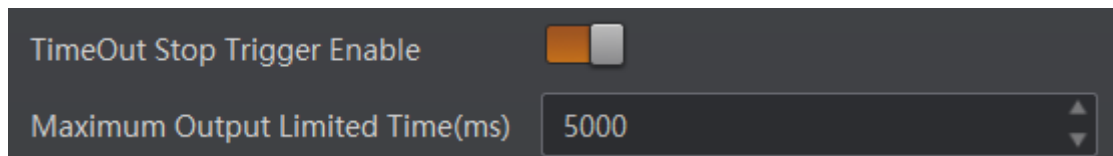


Figure 8-34 Stop Trigger via Timeout Duration

## Stop Trigger via Code Number

---

### Note

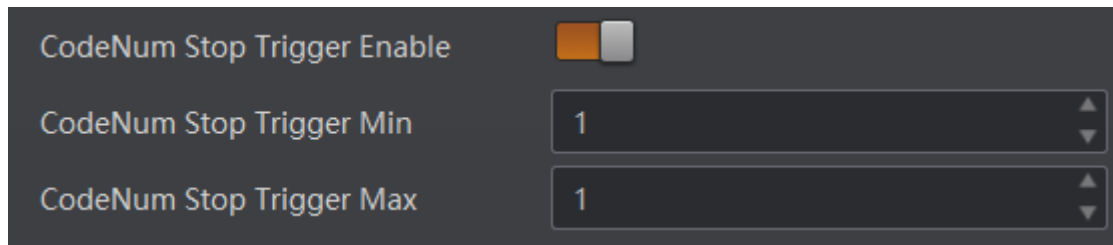
**CodeNum Stop Trigger Enable** is only available when the camera mode is set to **Normal** and the **Trigger Mode** is **On**.

---

This function means that the code quantity outputted by the device is restricted to the settings you configured here. You can enable **CodeNum Stop Trigger Enable**, and set **CodeNum Stop**

**Trigger Min** and **CodeNum Stop Trigger Max** according to actual demands.

- If the outputted code quantity is smaller than configured **CodeNum Stop Trigger Min**, and the device will output codes continuously.
- If the outputted code quantity is smaller than configured **CodeNum Stop Trigger Max**, and the device will stop outputting codes.
- If the outputted code quantity is between configured **CodeNum Stop Trigger Min** and **CodeNum Stop Trigger Max**, and the device will read and output codes according to trigger signals.
- If **CodeNum Stop Trigger Min** is same with **CodeNum Stop Trigger Max**, and the device will stop outputting codes when the number of outputted codes reaches the configured number.



CodeNum Stop Trigger Enable	<input checked="" type="checkbox"/>
CodeNum Stop Trigger Min	1
CodeNum Stop Trigger Max	1

Figure 8-35 Stop Trigger via Code Number

## 8.5 Signal Output Settings

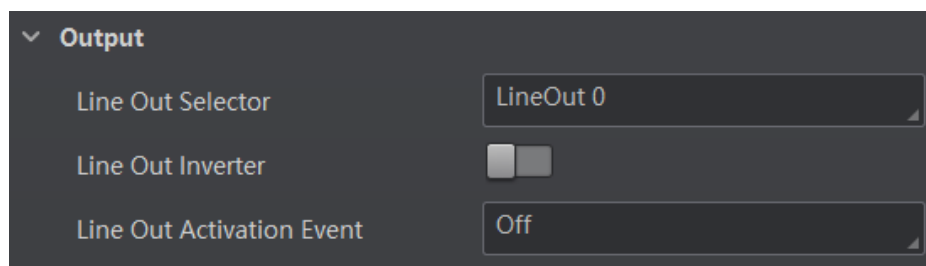
### 8.5.1 Select Output Signal

The device's output signal can control external devices like PLC, flashing light, etc. Click **I/O Control Settings** → **Output** → **Line Out Selector** to select output signal.

---

#### Note

- For the vari focal device, you can select customized lines as output signals. Refer to section **Line Mode Settings** for details.
  - The specific output signals may differ by device models.
- 



Output	
Line Out Selector	LineOut 0
Line Out Inverter	<input type="checkbox"/>
Line Out Activation Event	Off

Figure 8-36 Select Output Signal

## 8.5.2 Enable Line Inverter

The line inverter function allows the device to invert the electrical signal level of an I/O line, and meets requirements of different devices for high or low electrical signal level. You can go to **I/O Control Settings** → **Output** → **Line Out Inverter** to enable it.

---

### Note

The **Line Out Inverter** function is disabled by default.

---

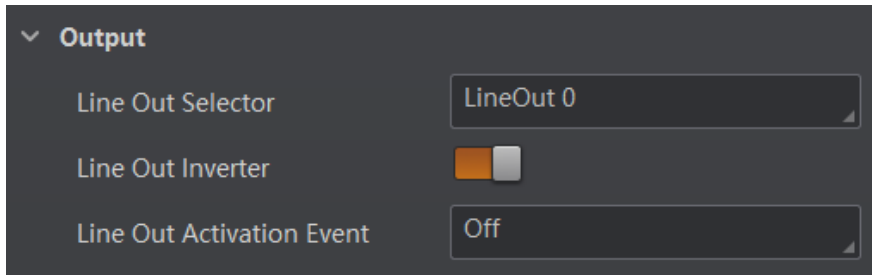


Figure 8-37 Enable Line Out Inverter

## 8.5.3 Set Event Source

### Note

The event source parameters may differ by device model.

---

The device supports outputting different trigger signals according to the event source you select. Click **I/O Control Settings** → **Output** → **Line Out Activation Event** to select event source.

The device supports following event sources, including **Off**, **NoCodeRead**, and **ReadSuccess**.

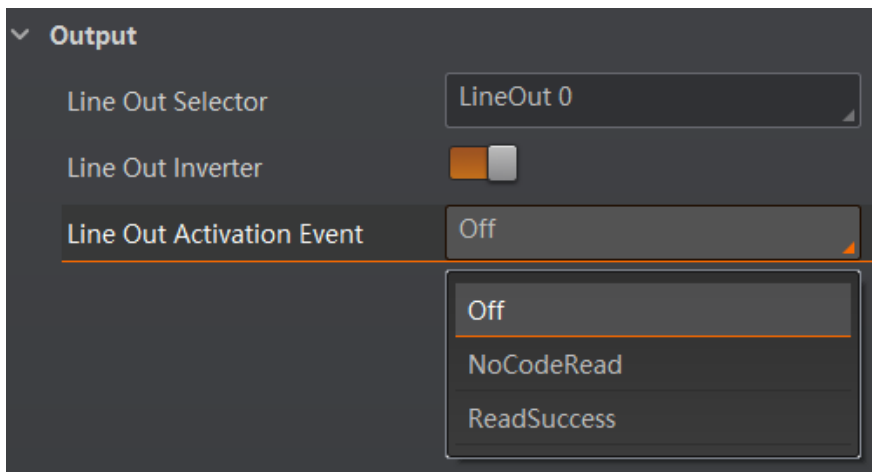


Figure 8-38 Set Event Source

## Select No Code Read

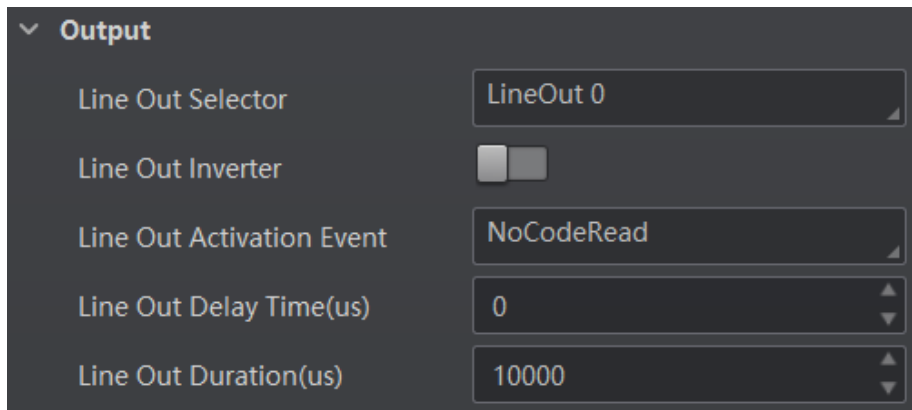
If you select **NoCodeRead** as **Line Out Activation Event**, you can set its output delay time and duration.

### Line Out Delay Time

It sets the delay time for outputting the output signal.

### Line Out Duration

It sets the time duration of the output signal.



The screenshot shows a configuration window titled 'Output' with a dropdown arrow. It contains five settings:

Setting	Value
Line Out Selector	LineOut 0
Line Out Inverter	<input type="checkbox"/>
Line Out Activation Event	NoCodeRead
Line Out Delay Time(us)	0
Line Out Duration(us)	10000

Figure 8-39 Select No Code Read

## Select Read Success

If you select **ReadSuccess** as **Line Out Activation Event**, you can set its output delay time and duration.

### Line Out Delay Time

It sets the delay time for outputting the output signal.

### Line Out Duration

It sets the time duration of the output signal.

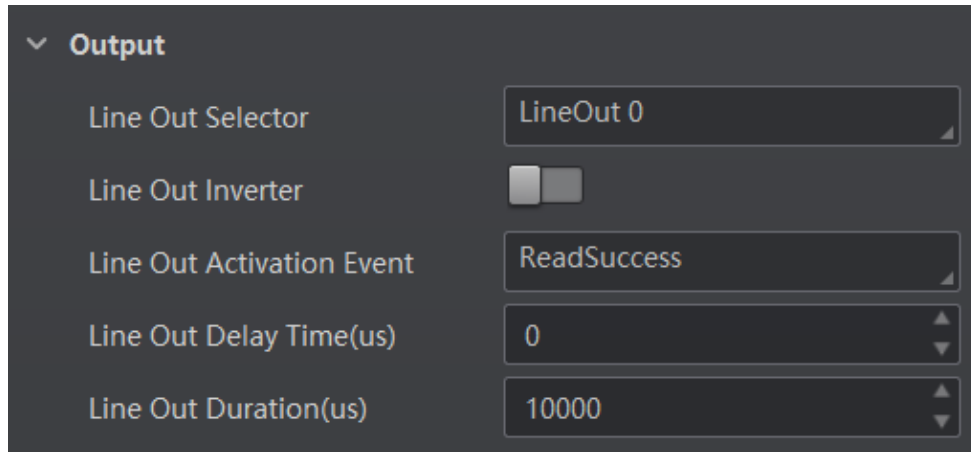


Figure 8-40 Select Read Success

## 8.6 Code Reading Result Settings

In **Data Processing** module, you can set filter rules for reading codes and other data processing related parameters.

### 8.6.1 Set Code Reading Result Output Mode

There are 2 types of output modes when the device mode is **Normal** and trigger mode is **On**: Instant output mode and non-instant output mode.

- Instant output mode means that the device can instantly output code reading results when recognizing codes if you enable **Instant Output Mode Enable** in **Filter Rule**.
- Non-instant output mode means that the device does not output code reading results it recognized until the trigger stops if **Instant Output Mode Enable** is not enabled. If the device does not recognize any codes during the whole process, images it captured will be output, and you can set which images to be outputted in **NoRead Image Index**.

When the device mode is **Normal** and trigger mode is **Off**, you can set **Filter Time** in **Filter Rule**. Within the configured **Filter Time**, the device will not output any code information.

---

#### Note

The filter rule and data processing parameters may differ with different device modes and trigger modes.

---

## 8.6.2 Set Filter Rule

You can set rules to filter unwanted codes to improve the reading efficiency in **Filter Rule**.

---

### Note

The filter rule parameters may differ with different device modes and trigger modes.

---

When the device mode is **Normal** and **Trigger Mode** is **On**, you can set the following parameters according to actual demands.

#### **Instant Output Mode Enable**

If this parameter is enabled, the device can instantly output code reading result when recognizing codes. If it is not enabled, the device will not output code reading result until the trigger stops.

#### **Minimum Output Time**

It sets the min. waiting time before data output. For example, if you set 500 ms as **Minimum Output Time**, the code would not be outputted until 500 ms is passed.

#### **Min. Code Length**

If the length of a code is shorter (in terms of the number of characters contained in the code) than the configured value, the device will not parse the contents of the code. The valid value is from 1 to 256. For example, if you set the value as 6, the device will not parse the contents of the codes which contain less than 6 characters.

#### **Max. Code Length**

If the length of a code is longer ((in terms of the number of characters contained in the code) than the configured value, the device will not parse the contents of the code. The valid value is from 1 to 256. For example, if you set the value as 9, the device will not parse the contents of the codes which contain more than 9 characters.

#### **Numeral Filter**

If this parameter is enabled, the device will only parse and read the numeral contents of the codes, and the non-numeral contents will be filtered out.

#### **CodeLen Max Num**

It sets the max. length of code that can be output.

#### **Code Offset Num**

It sets the range of code to be filtered. For example, the code is ABCDEFG, if you set this parameter as 2, the device will output CDEFG at last and filter AB.

#### **Begin with Specific Character for Result**

If this parameter is enabled, the device will only read the codes which begin with a specific character. Otherwise, the codes will be filtered out. You can enter the specific character in **Begin with**.

#### **Include Specific Character in Code**

If this parameter is enabled, the device will only read the codes which include a specific character. Otherwise, the codes will be filtered out. You can enter the specific character in **Character**.

#### Exclude Specific Character in Code

If this parameter is enabled, the device will only read the codes which exclude a specific character. Otherwise, the codes will be filtered out. You can enter the specific character in **Character**.

#### Regular Expression Filter Enable

If this parameter is enabled, the device will only read the codes which contain a specific regular expression. You can enter the specific regular expression in **Regular Expression Filter**.

#### NoRead TimeOut

If no codes are not recognized after the time you set here, the client software will output NoRead instead.

#### Read Times Threshold

If the reading results of a code is same for the configured times, the code will be regarded as valid and its reading result will be outputted. Or the code will be regarded as invalid and its reading result will not be outputted.

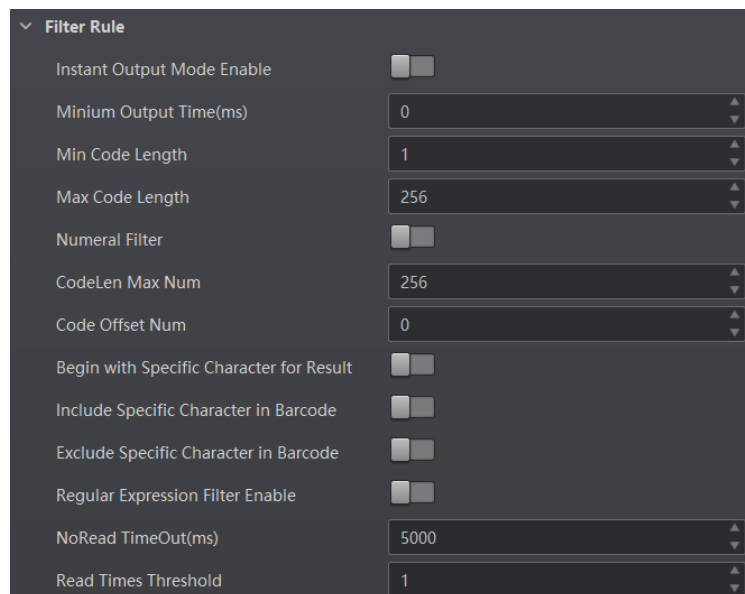
The image shows a software interface for configuring filter rules. It has a dark background with white text. The title 'Filter Rule' is at the top left with a dropdown arrow. Below it are various settings: 'Instant Output Mode Enable' (toggle), 'Minium Output Time(ms)' (input field with 0), 'Min Code Length' (input field with 1), 'Max Code Length' (input field with 256), 'Numeral Filter' (toggle), 'CodeLen Max Num' (input field with 256), 'Code Offset Num' (input field with 0), 'Begin with Specific Character for Result' (toggle), 'Include Specific Character in Barcode' (toggle), 'Exclude Specific Character in Barcode' (toggle), 'Regular Expression Filter Enable' (toggle), 'NoRead TimeOut(ms)' (input field with 5000), and 'Read Times Threshold' (input field with 1). Each input field has up and down arrow buttons on its right side.

Figure 8-41 Set Filter Rule

### 8.6.3 Set Result Format

Result format settings allow you to set the format and contents contained in the outputted code information. Result format is related to communication protocol and trigger mode. With different

selected communication protocol and trigger mode, you need to set corresponding parameters.

---

### Note

- The USB device supports two communication protocols (USB and SmartSDK) only, and the network device supports all communication protocols apart from USB communication protocol.
  - Result format settings are only available if you select **TCP Client**, **Serial**, **FTP**, **TCP Server**, **Profinet**, **MELSEC**, **Ethernet/IP**, **ModBus**, **UDP**, **Fins**, **USB** and **SLMP** as the communication protocol when the camera mode is **Normal**. Result format settings are not available for **Smart SDK** and **HTTP**.
  - For details about communication protocol, see section **Communication Settings** for details.
- 

## Result Output via Smart SDK or HTTP

When the communication protocol is **Smart SDK** or **HTTP**, device mode is **Normal** and trigger mode is **On**, you just need to set **NoRead Image Index** in the **Data Processing**.

---

### Note

The configurable parameters may differ if the internal trigger mode is enabled.

---

### NoRead Image Index

It sets the specific image that is outputted when no code information is read. For example, if you set this parameter as 5, and the 5th image will be output.

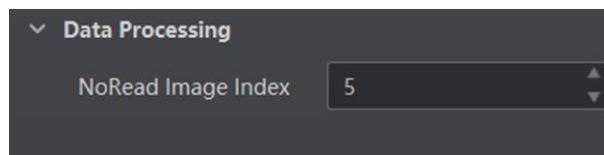


Figure 8-42 Result Output via Smart SDK or HTTP

## Result Output via TCP Client, TCP Server or Serial

If TCP client, TCP server or serial is selected as **Communication Protocols**, you need to set following parameters.

---

### Note

- The configurable parameters may differ by the trigger mode, and here we take the external trigger mode as an example.
  - When the communication protocol is **TCP Client**, **TCP Server** or **Serial**, the configurable parameters are similar with slight difference in term of parameter names. Here we take TCP client as **Communication Protocols** as an example, and refer to the actual device you got for details.
- 

### ROI Output NoRead Enable

If it is enabled, codes will be outputted in turn according to the **ROI Selector** of the algorithm ROI they belong.

### **TCP Format String**

It selects what contents you want to output, including code content, code type, angle, trigger start time, code score, etc. You can select multiple contents as desired, and the selected contents will be displayed in **TCP Output Format String**.

### **TCP Format Check**

You should click **Execute** in **TCP Format Check** to check if you entered is right in format, and the check result will be displayed in **TCP Format Check Result**.

### **NoRead Image Index**

It sets the specific image that is outputted when no code information is read. For example, if you set this parameter as 5, and the 5th image will be output.

### **TCP Output NoRead Enable**

If it is enabled, and the device will output the content you set in **TCP Output NoRead Text** when no code is recognized.

### **TCP Output Start Text**

The contents of the start part of the data outputted. You can set the contents according to actual condition.

### **TCP Output Stop Text**

The contents of the end part of the data outputted. You can set the contents according to actual condition.

### **TCP Output Barcode Enter Character Enable**

If it is enabled, carriage return will be added at the last of a trigger number.

### **TCP Output Barcode Newline Character Enable**

If it is enabled, a newline will be added at the last of a trigger number.

The screenshot shows a configuration window titled "Data Processing" with a dark background. It contains several settings:

- ROI Output Noread Enable: A toggle switch that is currently turned off.
- TCP Format String: An empty text input field.
- TCP Output Format String: An empty text input field.
- TCP Format Check: A button labeled "Execute".
- TCP Format Check Result: A text input field containing "<success>".
- NoRead Image Index: A dropdown menu showing the value "5".
- TCP Output NoRead Enable: A toggle switch that is currently turned on (orange).
- TCPCliet Add NoRead Enable: A toggle switch that is currently turned on (orange).
- TCP Output NoRead Text: A text input field containing "NoRead".
- TCP Output Start Text: An empty text input field.
- TCP Output Stop Text: An empty text input field.
- TCP Output Barcode Enter Character Enable: A toggle switch that is currently turned off.
- TCP Output Barcode Newline Character Enable: A toggle switch that is currently turned off.

Figure 8-43 Result Output via TCP Client

## Result Output via FTP

If FTP is selected as **Communication Protocols**, you need to set following parameters.

### Note

The configurable parameters may differ by the trigger mode, and here we take the external trigger mode as an example.

### NoRead Image Index

It sets the specific image that is outputted when no code information is read. For example, if you set this parameter as 5, and the 5th image will be output.

### Output Retrans Enable

If this parameter is enabled, the data is allowed to retransmit to FTP server, and should set specific value in **Output Retrans Number**.

### Note

If data retransmission is still failed after the times allowed for data retransmission is reached, the retransmission will be discarded.

### FTP Transmission Conditions

It sets the condition to upload the data outputted by the device to FTP server. **All** refers to upload the data always. **Read Code** refers to upload the data only when the code is read by the

device. **No Read Code** refers to upload the data only when no code is read by the device.

### FTP Transmission Result Contain

It selects contents to upload to the FTP server. **Just Result** refers to only upload the content of the code. **Just Picture** refers to only upload the code picture. **Result and Picture** refers to upload both the content of the code and the picture.

### FTP Image Format

It sets the format of the picture uploaded to FTP server.



The device currently support JPG format only.

---

### FTP File Default Name

It refers to the default name of the file uploaded to FTP server. You can set it according to actual condition.

### FTP File Separator

It refers to the separator that separates file name. You can set it according to actual condition.

### FTP File Name Contain Package Number Enable

If this parameter is enabled, the name of the file uploaded to FTP server will contain the package ID.

### FTP File Name Contain Barcode Number Enable

If this parameter is enabled, the name of the file uploaded to FTP server will contain the number of the code.

### FTP File Name Contain Barcode Info Enable

If this parameter is enabled, the name of the file uploaded to FTP server will contain the name of the package.

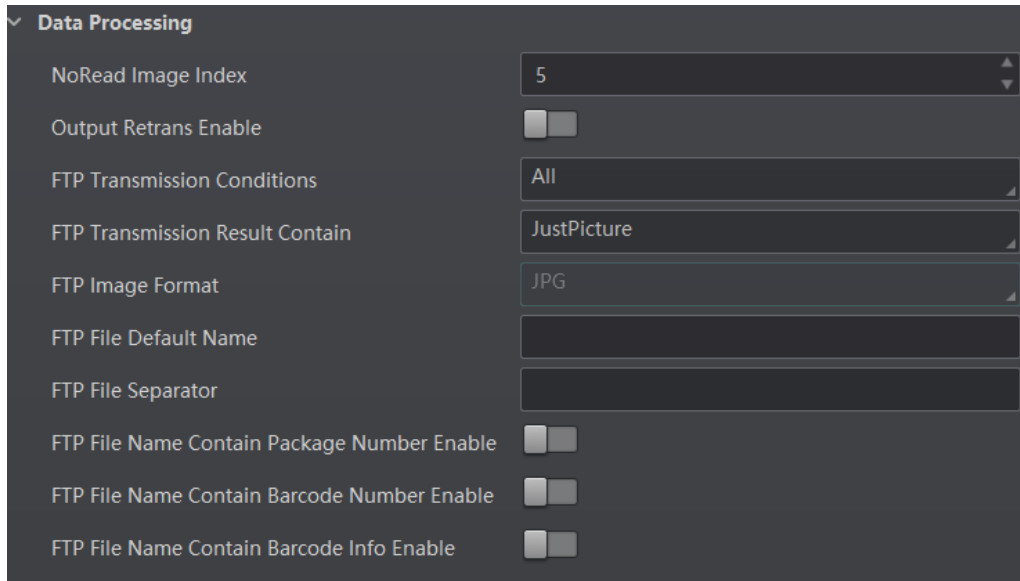


Figure 8-44 Result Output via FTP

## Result Output via USB, UDP or SLMP

If USB, UDP or SLMP is selected as **Communication Protocols**, you need to set following parameters.

---

### Note

- The configurable parameters may differ by the trigger mode, and here we take the external trigger mode as an example.
  - When the communication protocol is **USB, UDP or SLMP**, the configurable parameters are similar with slight difference in term of parameter names. Here we take UDP as **Communication Protocols** as an example, and refer to the actual device you got for details.
- 

### ROI Output NoRead Enable

If it is enabled, codes will be outputted in turn according to the **ROI Selector** of the algorithm ROI they belong.

### UDP File Name Content

It selects what contents you want to output, including code content, code type, angle, trigger start time, code score, etc. You can select multiple contents as desired, and the selected contents will be displayed in **UDP Output Format String**.

### UDP Format Check

You should click **Execute** in **UDP Format Check** to check if you entered is right in format, and the check result will be displayed in **UDP Format Check Result**.

### UDP Output Start Text

The contents of the start part of the data outputted. You can set the contents according to actual condition.

**UDP Output Stop Text**

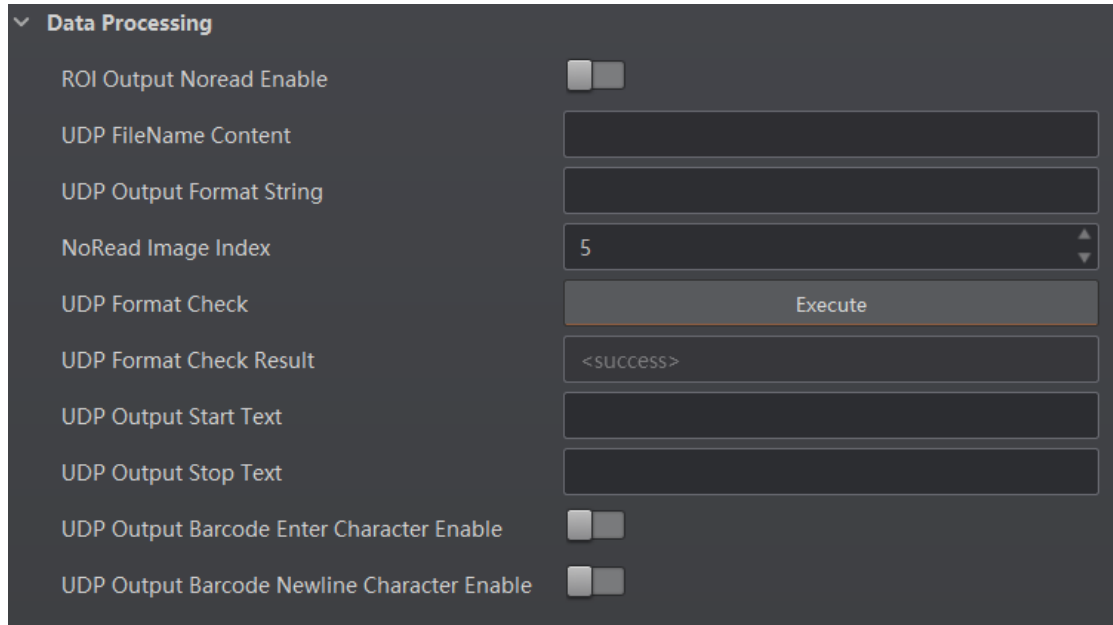
The contents of the end part of the data outputted. You can set the contents according to actual condition.

**UDP Output Barcode Enter Character Enable**

If it is enabled, carriage return will be added at the last of a trigger number.

**UDP Output Barcode Newline Character Enable**

If it is enabled, a newline will be added at the last of a trigger number.



The screenshot shows a configuration window titled "Data Processing" with a dropdown arrow. It contains several settings:

- ROI Output Noread Enable: A toggle switch that is currently turned off.
- UDP FileName Content: A text input field.
- UDP Output Format String: A text input field.
- NoRead Image Index: A numeric input field with the value "5" and up/down arrow buttons.
- UDP Format Check: A button labeled "Execute".
- UDP Format Check Result: A text input field containing "<SUCCESS>".
- UDP Output Start Text: A text input field.
- UDP Output Stop Text: A text input field.
- UDP Output Barcode Enter Character Enable: A toggle switch that is currently turned off.
- UDP Output Barcode Newline Character Enable: A toggle switch that is currently turned off.

Figure 8-45 Result Output via UDP

**Result Output via MELSEC, Profinet, Ethernet/IP, ModBus or Fins**

If MELSEC, Profinet, Ethernet/IP, ModBus or Fins is selected as **Communication Protocols**, you need to set following parameters.

---

**Note**

- The configurable parameters may differ by the trigger mode, and here we take the external trigger mode as an example.
  - When the communication protocol is **MELSEC, Profinet, Ethernet/IP, ModBus** or **Fins**, the configurable parameters are similar with slight difference in term of parameter names. Here we take MELSEC as **Communication Protocols** as an example, and refer to the actual device you got for details.
-

**ROI Output NoRead Enable**

If it is enabled, codes will be outputted in turn according to the **ROI Selector** of the algorithm ROI they belong.

**MELSEC Format String**

It selects what contents you want to output, including code content, code type, angle, trigger start time, code score, etc. You can select multiple contents as desired, and the selected contents will be displayed in **MELSEC Output Format String**.

**MELSEC Format Check**

You should click **Execute** in **MELSEC Format Check** to check if you entered is right in format, and the check result will be displayed in **MELSEC Format Check Result**.

**MELSEC Output Start Text**

The contents of the start part of the data outputted. You can set the contents according to actual condition.

**MELSEC Output Stop Text**

The contents of the end part of the data outputted. You can set the contents according to actual condition.

**MELSEC Output Barcode Enter Character Enable**

If it is enabled, carriage return will be added at the last of a trigger number.

**MELSEC Server Output Barcode Newline Character Enable**

If it is enabled, a newline will be added at the last of a trigger number.

▼ Data Processing

ROI Output Noread Enable	<input type="checkbox"/>
MELSEC Format String	<input type="text"/>
MELSEC Output Format String	<input type="text"/>
MELSEC Format Check	<input type="button" value="Execute"/>
MELSEC Format Check Result	<input type="text" value="&lt;success&gt;"/>
MELSEC Output Start Text	<input type="text"/>
MELSEC Output Stop Text	<input type="text"/>
MELSEC Output Barcode Enter Character Enable	<input type="checkbox"/>
MELSEC Output Barcode Newline Character Enable	<input type="checkbox"/>

**Figure 8-46 Result Output via MELSEC**

## 8.7 Communication Settings

The communication protocol is used to transmit and output code reading result and image. The communication protocol is related to the device modes. With various device modes, the device supports different communication protocols and corresponding parameters.

When the camera mode is **Test** or **Raw**, the device only supports **SmartSDK** protocol and no parameter settings are required. While in **Normal** mode, the device supports **SmartSDK**, **TCP Client**, **Serial**, **FTP**, **HTTP**, **TCP Server**, **Profinet**, **MELSEC**, **Ethernet/IP**, **ModBus**, **UDP**, **Fins**, **USB** and **SLMP** communication protocols, and you need to set corresponding parameters.

---

### Note

The USB device supports two communication protocols (USB and SmartSDK) only, and the network device supports all communication protocols apart from USB communication protocol.

---

### 8.7.1 Smart SDK

If **Smart SDK** is selected as the **Communication Protocols**, you can enable **SmartSdk Protocol** to let the device output data via **Smart SDK**.

#### Encode JPG Flag

If enabled, the device will compress the image data.

#### Quantity of Jpg

You can enter a number (range: 50 to 99) to determine the compression quality

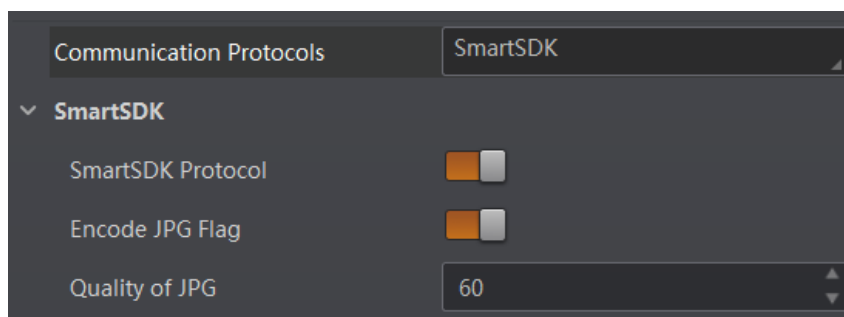


Figure 8-47 Smart SDK

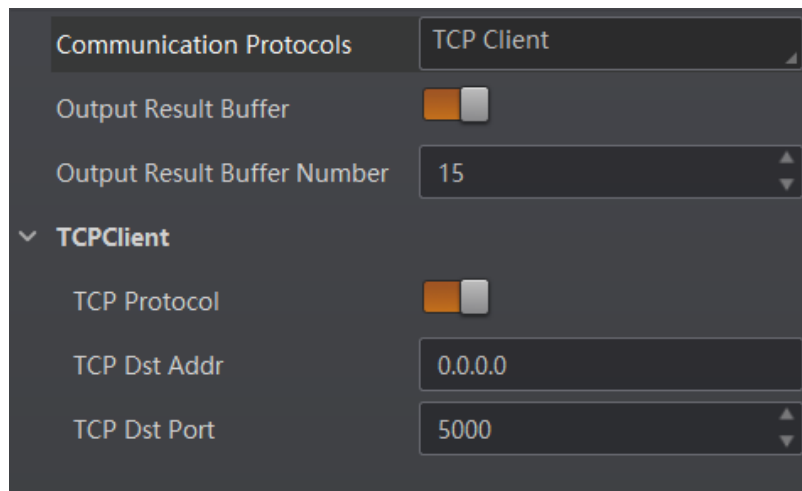
### 8.7.2 TCP Client

If select **TCP Client** as the **Communication Protocols**, you need to set following parameters.

#### Output Result Buffer

If enabled, when the TCP server is abnormal, the device will cache the images. When the server returns to normal, the device will send the cached images to the server. After this parameter being enabled, you can set **Output Result Buffer Number** to determine the number of the images that the device will cache.

You can also enable **TCP Protocol**, enter **TCP Dst Addr** and **TCP Dst Port**.

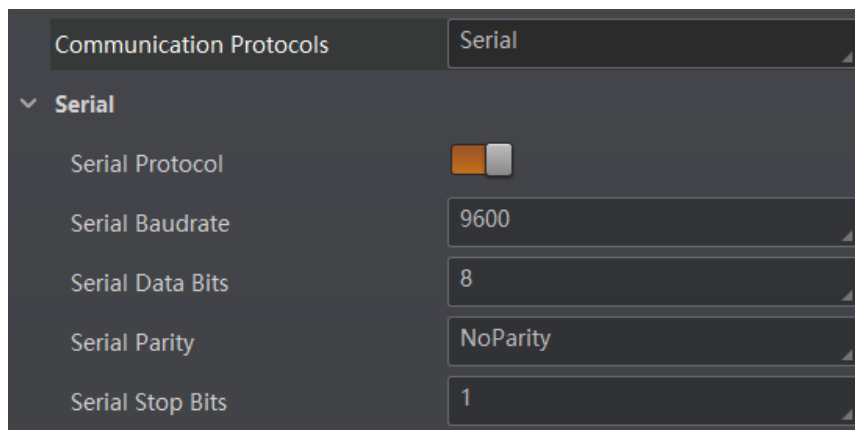


The screenshot shows a configuration window for the TCP Client. At the top, 'Communication Protocols' is set to 'TCP Client'. Below this, 'Output Result Buffer' is a toggle switch that is turned on, and 'Output Result Buffer Number' is set to 15. A section titled 'TCPClient' is expanded, showing 'TCP Protocol' as a toggle switch that is turned on. Below this, 'TCP Dst Addr' is set to '0.0.0.0' and 'TCP Dst Port' is set to '5000'.

Figure 8-48 TCP Client

### 8.7.3 Serial

If **Serial** is selected as the **Communication Protocols**, you can enable **Serial Protocol**, enter **Serial Baud Rate**, **Serial Data Bits**, **Serial Parity**, and **Serial Stop Bits**.



The screenshot shows a configuration window for the Serial protocol. 'Communication Protocols' is set to 'Serial'. The 'Serial' section is expanded, showing 'Serial Protocol' as a toggle switch that is turned on. Below this, 'Serial Baudrate' is set to 9600, 'Serial Data Bits' is set to 8, 'Serial Parity' is set to 'NoParity', and 'Serial Stop Bits' is set to 1.

Figure 8-49 Serial

### 8.7.4 FTP

If select **FTP** as the **Communication Protocols**, you need to set following parameters.

#### Output Result Buffer

If enabled, when the FTP server is abnormal, the device will cache the images. When the FTP server returns to normal, the device will send the cached images to the server. After this parameter being enabled, you can set **Output Result Buffer Number** to determine the number of the images that the device will cache.

You can also you can enable **FTP Protocol**, enter **FTP Host Addr**,**FTP Host Port**, **FTP User Name**, and **FTP User PWD**.

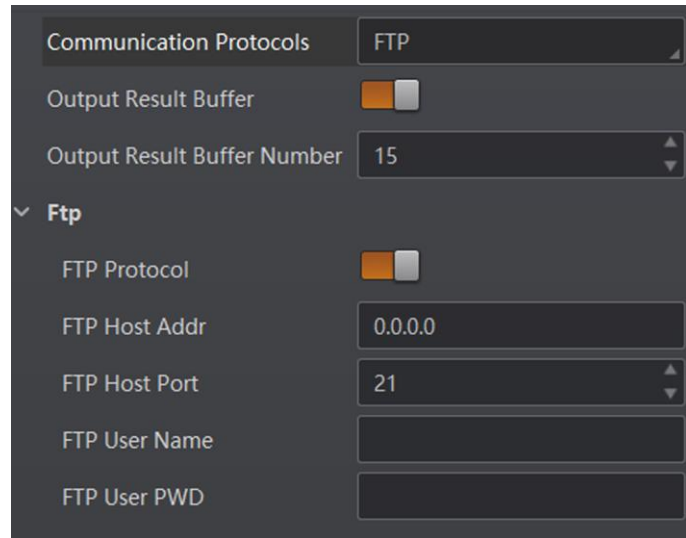
The screenshot shows a configuration window with a dark background. At the top, 'Communication Protocols' is set to 'FTP'. Below this, 'Output Result Buffer' is a toggle switch that is turned on (orange). 'Output Result Buffer Number' is a spinner box set to '15'. A section header 'Ftp' is expanded with a downward arrow. Under this section, 'FTP Protocol' is a toggle switch that is turned on. 'FTP Host Addr' is a text box containing '0.0.0.0'. 'FTP Host Port' is a spinner box set to '21'. 'FTP User Name' and 'FTP User PWD' are empty text boxes.

Figure 8-50 FTP

### 8.7.5 HTTP

If select **HTTP** as the **Communication Protocols**, you can enable **HTTP Server**, enter **HTTP Sever Port** and **WebRefresh Cycle**.

#### HTTP Server

If enabled, the device will output data via HTTP server.

#### HTTP Server Port

Enter the port No. of the HTTP server.

#### WebRefresh Cycle

Set the frequency to refresh the Web.

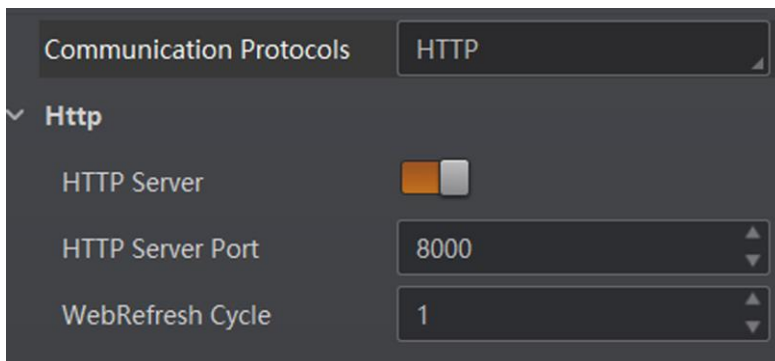
The screenshot shows a configuration window with a dark background. At the top, 'Communication Protocols' is set to 'HTTP'. Below this, a section header 'Http' is expanded with a downward arrow. Under this section, 'HTTP Server' is a toggle switch that is turned on (orange). 'HTTP Server Port' is a spinner box set to '8000'. 'WebRefresh Cycle' is a spinner box set to '1'.

Figure 8-51 HTTP

### 8.7.6 TCP Server

If **TCP Server** is selected as the **Communication Protocols**, you can enable **TCP Server Enable**, and enter **TCP Server Port**.

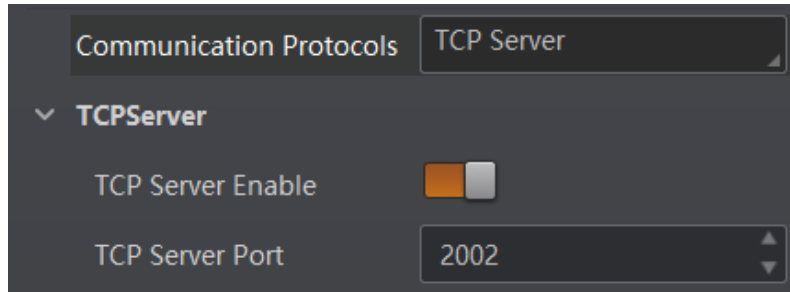


Figure 8-52 TCP Server

### 8.7.7 Profinet

If **Profinet** is selected as the **Communication Protocols**, you can enable **Profinet Enable** and set **Profinet Device Name** according to actual demands.

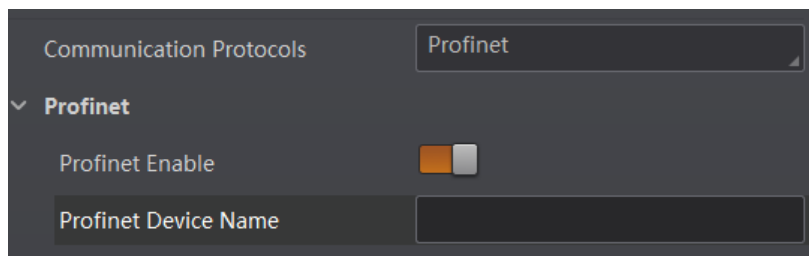


Figure 8-53 Profinet

### 8.7.8 MELSEC

If **MELSEC** is selected as the **Communication Protocols**, you can enable **MELSEC Protocol Enable** and set related parameters according to actual demands.

#### MELSEC Destination Address

It sets the IP address of the target PLC.

#### MELSEC Destination Port

It sets the port number of the target PLC.

#### MELSEC Data Base Address

It sets the first address of the data area.

#### MELSEC State Base Address

It sets the first address of the status area.

**MELSEC Network Number**

It sets the network No.

**MELSEC PLC Number**

It sets the PLC No.

**MELSEC Module I/O Number**

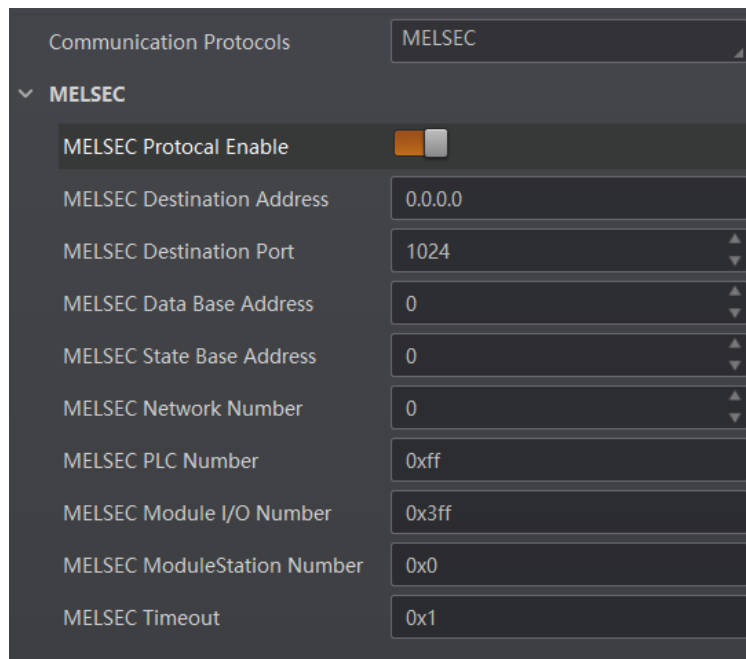
It sets the target module's I/O number.

**MELSEC Module Station Number**

It displays the module station number.

**MELSEC Timeout**

It sets the waiting time before the returning of PLC's response.



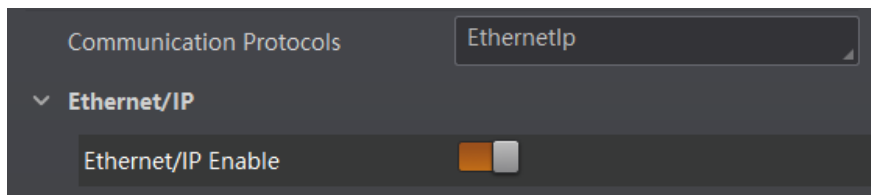
The screenshot shows a configuration window for MELSEC. At the top, 'Communication Protocols' is set to 'MELSEC'. Below this, the 'MELSEC' section is expanded, showing a list of settings:

Setting	Value
MELSEC Protocol Enable	<input checked="" type="checkbox"/>
MELSEC Destination Address	0.0.0.0
MELSEC Destination Port	1024
MELSEC Data Base Address	0
MELSEC State Base Address	0
MELSEC Network Number	0
MELSEC PLC Number	0xff
MELSEC Module I/O Number	0x3ff
MELSEC ModuleStation Number	0x0
MELSEC Timeout	0x1

Figure 8-54 MELSEC

### 8.7.9 Ethernet/IP

If **Ethernet/IP** is selected as the **Communication Protocols**, you can enable **Ethernet/IP Enable**, and the device will output data via Ethernet/IP.



The screenshot shows a configuration window for Ethernet/IP. At the top, 'Communication Protocols' is set to 'EthernetIp'. Below this, the 'Ethernet/IP' section is expanded, showing a single setting:

Setting	Value
Ethernet/IP Enable	<input checked="" type="checkbox"/>

Figure 8-55 Ethernet/IP

### 8.7.10 ModBus

If **ModBus** is selected as the **Communication Protocols**, you can enable **ModBus Enable** and set related parameters according to actual demands.

#### ModBus Mode

It includes server and client, and is server by default.



#### Note

If client is selected as **ModBus Mode**, you need to set **ModBus Server IP**, **ModBus Server Port** and **ModBus Scan Rate (ms)**.

---

#### ModBus Control Address Space

It is holding\_register by default.

#### ModBus Control Address Offset

It refers to the address offset, and is 0 by default.

#### ModBus Control Data Number

It is 2 by default.

#### ModBus State Address Space

It is input\_register by default.

#### ModBus State Address Offset

It is 0 by default.

#### ModBus State Data Number

It is 2 by default.

#### ModBus Result Address Space

It is input\_register by default.

#### ModBus Result Address Offset

It is 4 by default.

#### ModBus String Byte Swap

If it is enabled, string byte is saved by big-endian. If it is not enabled, string byte is saved by little-endian.

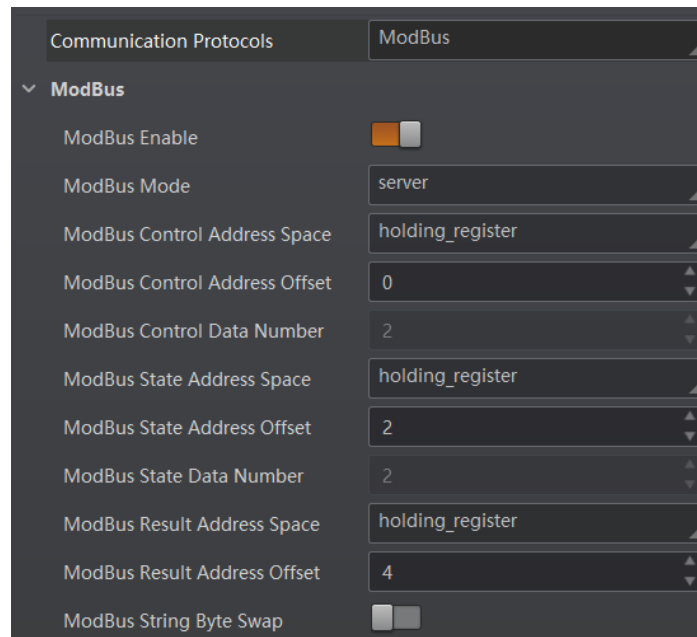


Figure 8-56 ModBus

### 8.7.11 UDP

If **UDP** is selected as the **Communication Protocols**, you can enable **UDP Protocol Enable**, and set **UDP Dst IP** and **UDP Dst Port**.

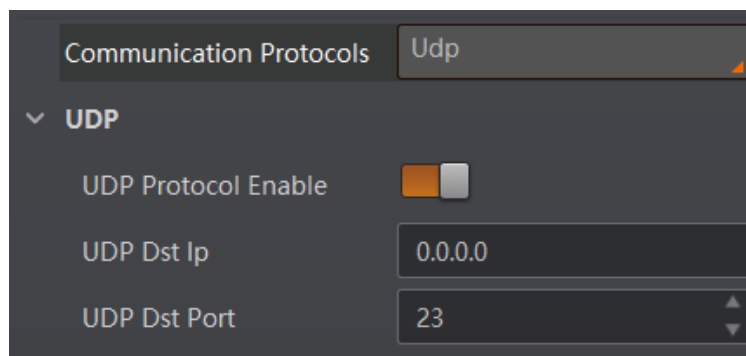


Figure 8-57 UDP

### 8.7.12 Fins

If **Fins** is selected as the **Communication Protocols**, you can enable **Fins Enable** and set related parameters according to actual demands.

#### Fins Communication Mode

It includes UDP or TCP.

#### Fins Local Port

It is 9600 by default.

### **Fins Dst IP**

It sets the IP address of the target device.

### **Fins Dst Port**

It sets the port of the target device.

### **Fins Data Format**

It includes 16-bit or 32-bit.

### **Fins Scan Rate (ms)**

It sets the interval that the device reads the server's control register, and the unit is ms.

### **Fins Control Area**

It is saved in DM area by default.

### **Fins Control Addr**

You can set it according to actual demands. Make sure that each area cannot be overlapped and covered.

### **Fins State Area**

It is saved in DM area by default.

### **Fins State Addr**

You can set it according to actual demands. Make sure that each area cannot be overlapped and covered.

### **Fins Result Area**

It is saved in DM area by default.

### **Fins Result Addr**

You can set it according to actual demands. Make sure that each area cannot be overlapped and covered.

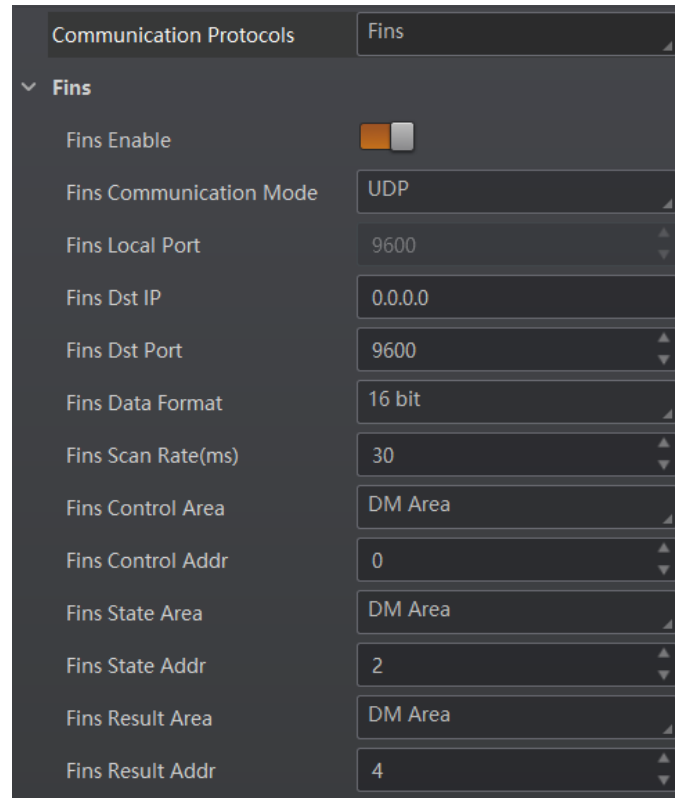


Figure 8-58 Fins

### 8.7.13 SLMP

If **SLMP** is selected as the **Communication Protocols**, you can enable **SLMP Enable** and set related parameters according to actual demands.

#### SLMP Dst Addr

It sets the IP address of the target PLC.

#### SLMP Dst Port

It sets the port number of the target PLC.

#### SLMP Data Base Addr

It sets the first address of the data area.

#### SLMP State Base Addr

It sets the first address of the status area.

#### SLMP Network Num

It sets the network No.

#### SLMP PLC Num

It sets the PLC No.

**SLMP Module I/O Num**

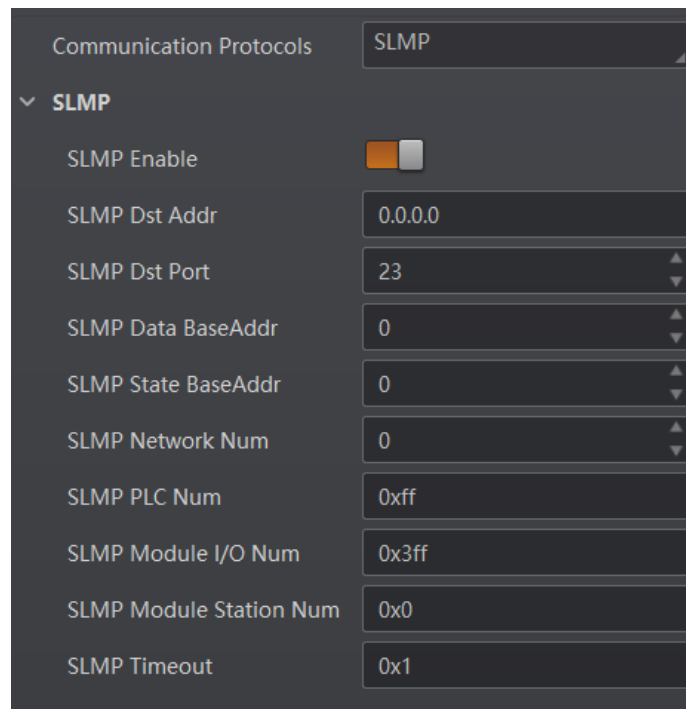
It sets the target module's I/O number.

**SLMP Module Station Num**

It displays the module station number.

**SLMP Timeout**

It sets the waiting time before the returning of PLC's response.



The screenshot shows a configuration window for 'Communication Protocols'. The 'SLMP' protocol is selected. Under the 'SLMP' section, there is a list of settings:

Setting	Value
SLMP Enable	<input checked="" type="checkbox"/>
SLMP Dst Addr	0.0.0.0
SLMP Dst Port	23
SLMP Data BaseAddr	0
SLMP State BaseAddr	0
SLMP Network Num	0
SLMP PLC Num	0xff
SLMP Module I/O Num	0x3ff
SLMP Module Station Num	0x0
SLMP Timeout	0x1

**Figure 8-59 SLMP**

### 8.7.14 USB

If **USB** is selected as the **Communication Protocols**, you can enable **USB Enable**, set **USB Output**, **USB Baudrate**, **USB Data Bits**, **USB Parity**, and **USB Stop Bits**.

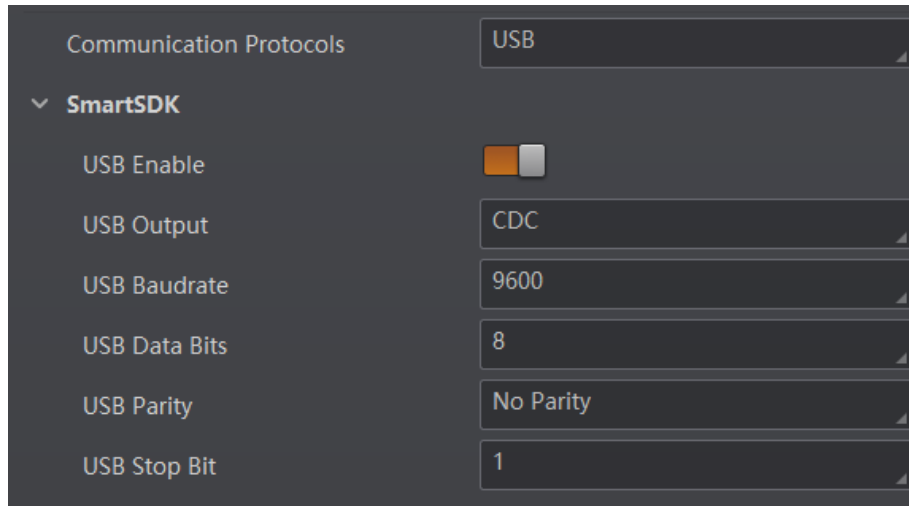


Figure 8-60 USB

## 8.8 Set Multicast

The multicast function is used to let multiple devices have the same trigger number when they are acquiring images and analyzing codes at the same time. When each device sends the trigger number and outputted images to the code reading platform, the platform will integrate the images with the same trigger number as the information of the same package.

The main principle of the multicast function is to set one main device among multiple devices, and remaining devices are called sub devices. As the first triggered device, the main device sends trigger numbers to sub devices each time, and sub devices replace their trigger numbers with received ones so that all devices have the same trigger numbers.

Follow the steps below to set multicast function according to actual demands.

### Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to **MultiCamera Control**, set one device as **Main** in **MultiCamera Mode** according to actual demands.

---

### Note

You can set 32 sub devices at most.

---

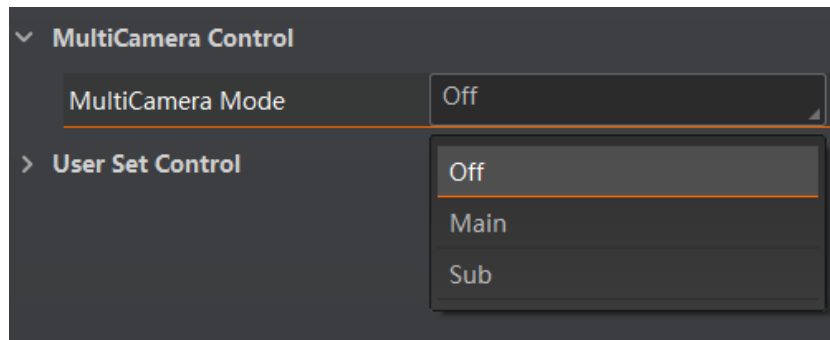


Figure 8-61 Set Multicamera Mode

### 3. Set **GroupID**.

---

#### **Note**

You should set the same GroupID for devices in the same multicast system.

---

4. (Optional) After automatic networking, you can view the main device's name, IP address, and serial number via **MultiCameraInfo**, and view sub devices' name, IP address, and serial number via **SubCameraInfo**.

## 8.9 User Set Customization

The Configuration Management module allows you to set and manage the user set. A user set is a group of parameter values with all the settings needed to control the device, and you can save, load and switch different user sets.

### Save Settings

If you have set the device parameters as desired, you can save them into the user set. Go to **Config Management** → **Save Settings**, and click **UserSet1**, **UserSet2**, or **UserSet3** to save the current device settings.

### Load Settings

You can load the user set to restore the device to the saved group of parameter values again if required. Go to **Config Management** → **Load Settings**, and click **Default**, **UserSet1**, **UserSet2**, or **UserSet3** to load settings.

---

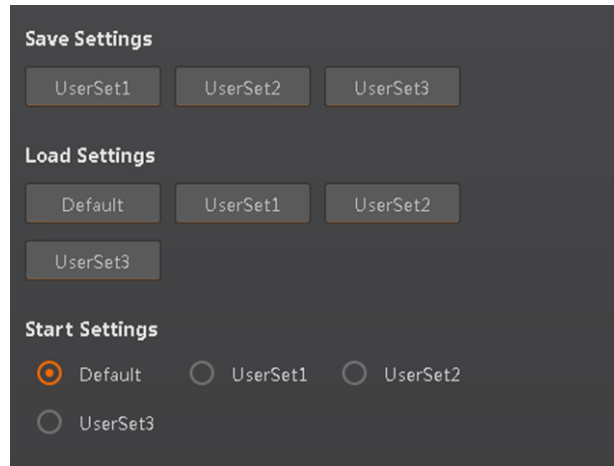
#### **Note**

The **Default** refers to restore the device parameter settings to the factory ones.

---

### Start Settings

The selected user set will be automatically loaded after the device being powered on. For example, if you select **Default**, the device parameter settings will be restored to the factory settings.



**Figure 8-63 User Set Customization**

## Chapter 9 Device Operation

The device operation section introduces some basic device operations about how to start live view, acquisition and recording, add cross line in the image, split window, view reports, etc.

---



### Note

Connecting the device to the client software is required before device operation.

---

### 9.1 Live View

You can view the real-time image in the live view window.

Click  in live view window to start live view, or click  to stop.

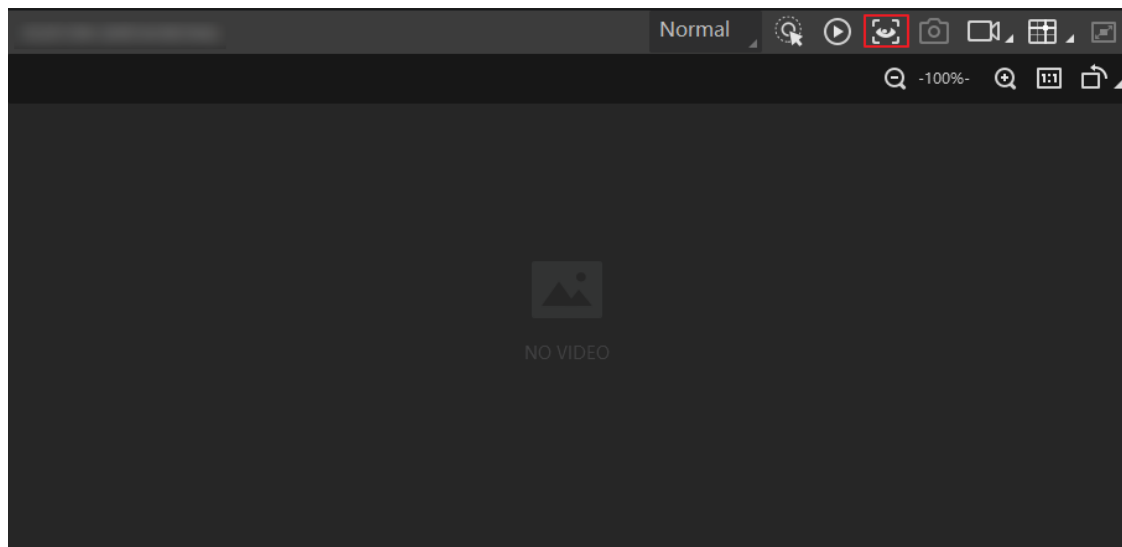




Figure 9-1 Live View

### 9.2 Enable Acquisition

Enabling acquisition allows the device to acquire the real-time stream.

Click  in live view window to start acquisition, or click  to stop. You can also right click the device on the device list, and click **Stop Acquisition** to stop acquiring streams.

---

### Note

Acquisition is still going on if you only stop live view.

---

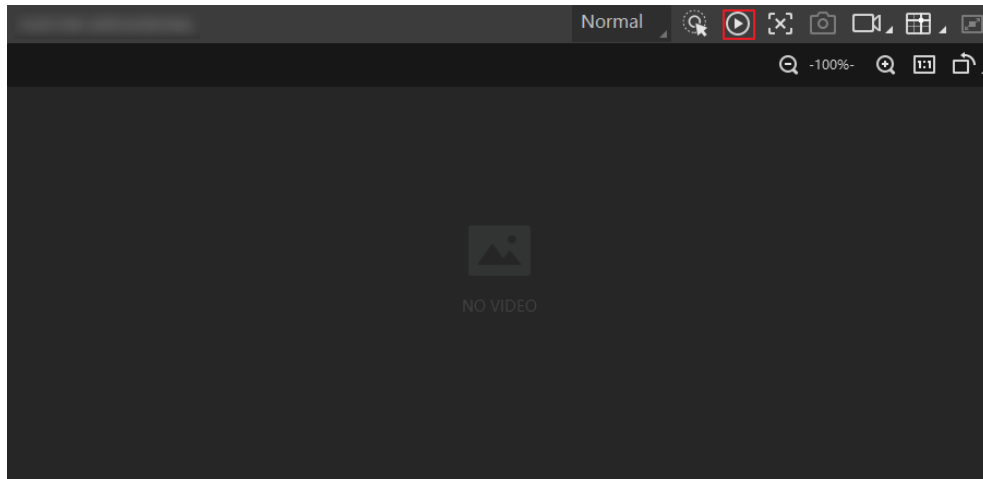


Figure 9-2 Enable Acquisition

### 9.3 Add Cross Line

During live view, you can add a cross line on the live view image to adjust the position of the object in the view.




Click  in live view window to add cross line, and click  (beside ) to open the editing window to set cross line parameters.



Figure 9-3 Add Cross Line

### 9.4 Start Recording





During live view, you can record video files and capture images continuously.

---

#### Note

Enabling acquisition is required before recording.

---

Click  in live view window to start recording, and click the icon again to stop. You can also click  (beside ) , and then click  to capture images of the live view continuously.

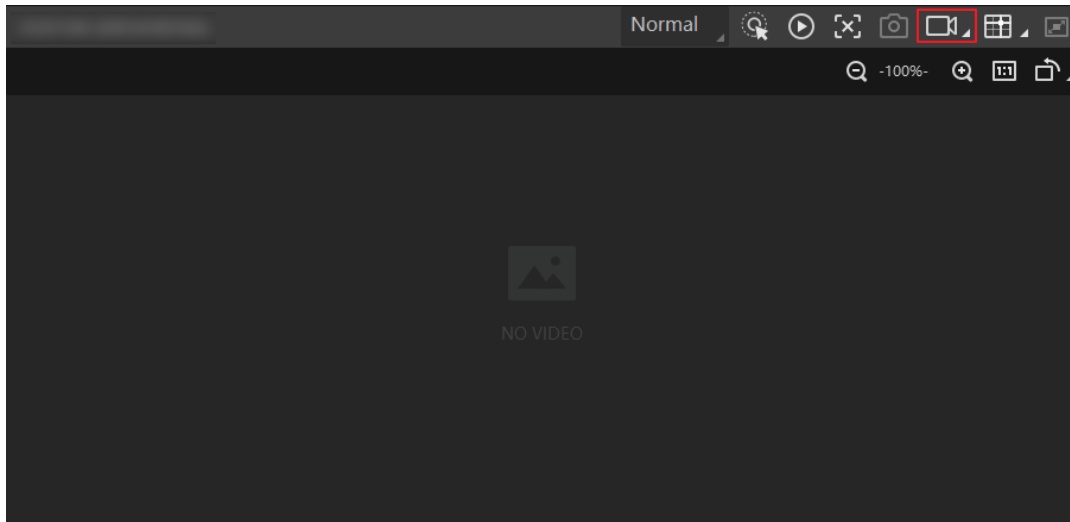



Figure 9-4 Start Recording

## 9.5 Split Window

The client software supports window division function that allows you to split the window into multiple-window mode to view the live view of multiple devices at the same time.

Click  in control toolbar to select window division mode. You can click **Custom** to customize window division as you desired.

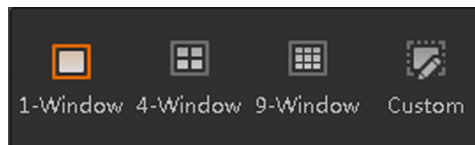



Figure 9-5 Split Window

## 9.6 View Reports

During acquisition or live view, you can view the reading status of the device.

Click  in control toolbar to open the statistics window to view the detailed information. **Read Code Images** refers to the number of the images on which the codes are read by the device. **Unread Code Images** refers to the number of the images on which the codes are not read by the device. **Read Rate** refers to the code reading rate.

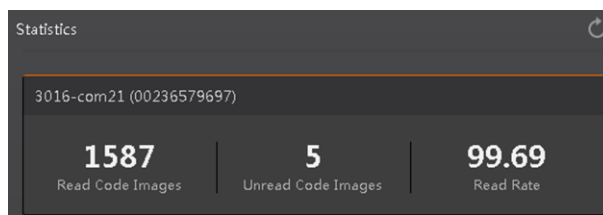



Figure 9-6 View Reports

## 9.7 View Log

You can view the device logs and export them to the local PC.

Click  in control toolbar to open the device log window, and you can view different types of logs, including device errors, warning, and informational log, etc.

Type	Time	Content	Source
Info	2019-06-19 17:26:50:216	dir is : (D:\SmartCamera\0\SmartCameraLog\), time is (...)	SmartConfig.cp...
Info	2019-06-19 17:26:50:216	Read command export log file	Manager.cpp ...
Error	2019-06-19 17:23:00:742	Over and current time is [179774033.858915]ms!	SmartConfig.cp...
Info	2019-06-19 17:23:00:742	no need to compress again! time:918.756448(ms).	SmartConfig.cp...
Info	2019-06-19 17:23:00:742	Read command export log file	Manager.cpp ...
Error	2019-06-19 17:23:00:742	Over and current time is [179774033.695433]ms!	SmartConfig.cp...
Error	2019-06-19 17:23:00:742	log file len:461356!	SmartConfig.cp...
Info	2019-06-19 17:22:59:0822	dir is : (D:\SmartCamera\0\SmartCameraLog\), time is (...)	SmartConfig.cp...
Info	2019-06-19 17:22:59:0822	Read command export log file	Manager.cpp ...
Info	2019-06-19 17:21:53:0652	The package(22) frame (56396) Identify BCR codenum...	BcrProc.cpp ...
Info	2019-06-19 17:14:48:0384	The package(22) frame (45763) Identify BCR codenum...	BcrProc.cpp ...

Figure 9-7 View Log

## 9.8 Enable Device Auto Work

This function allows the device to automatically enter the operating status after being powered on.

You can go to **Config Management** → **Device Auto Work Enable**, and enable **Device Auto Work Enable**.

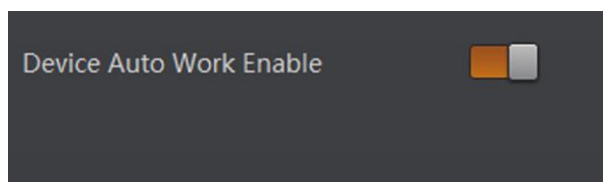


Figure 9-8 Enable Device Auto Work


## Chapter 10 Device Maintenance

### 10.1 Update Firmware

The device supports updating firmware via the client software.

#### Note

- Disconnect the device with client software.
- Please use the firmware package of the corresponding device model for upgrading.
- Do not power off the device or disconnect network during upgrading.
- The device will reboot automatically after updating the firmware.

Select the device to be updated in the device list, right click the device, and click **Firmware Update**. Click  to select update file from local PC, and click **Update** to update firmware.

#### Note

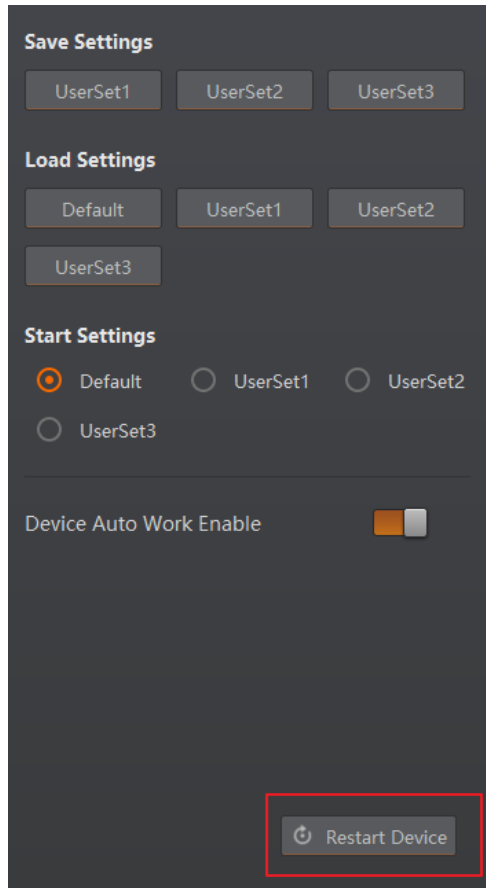
You can also go to **Tool** → **Firmware Updater** to update firmware.



Figure 10-1 Update Firmware

### 10.2 Reboot Device

You can reboot the device via client software in 2 ways. Go to **Config Management**, and click **Restart Device**. Or, you can select the device to be rebooted in the device list, right click the device, and click **Device Reset**.



**Figure 10-2 Reboot Device**

## Chapter 11 FAQ (Frequently Asked Question)

### 11.1 Why the image is very dark?

#### **Problem**

All black or too dark during preview.

#### **Reason**

Too small adjustment value of exposure and gain.

#### **Solution**

Increase exposure and gain appropriately.

### 11.2 Why the image's frame rate is very low in the live view?

#### **Problem**

Image incoherent/low frame rate/image tearing when adjusting images.

#### **Reason**

Network speed is not 100 Mbps.

#### **Solution**

Check whether network speed is 100 Mbps or not.

### 11.3 Why there is no device listed after I run the IDMVS client software?

#### **Problem**

Run IDMVS client, there is no listed device.

#### **Reason**

- The device is powered off.
- Network exception occurs.

#### **Solution**

- Check the device power connection (observe whether the PWR light is solid green or not) to

make sure that the device is powered up normally.

- Check the network connection (observe whether the LNK light is flashing green or not) to make sure the device can be connected to the network normally, and the PC network and the device are in the same network segment.

## 11.4 Why there is no image in the live view?

### Problem

No image in the live view.

### Reason

- Trigger mode is enabled, but there is no trigger signal.
- Network speed is not 100 Mbps.

### Solution

- Sent the trigger signal to the device, or disable the trigger mode.
- Check whether the network speed is 100 Mbps or not.



See Far, Go Further