ID2000 Series Smart Code Reader

User Manual

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 our website (***https:// www.mstarvision.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

CE

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
Danger	Indicates a hazardous situation which, if not avoided, will or could result in death or serious injury.
Caution	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
Note	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 dismounting, 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.

Contents

Chapter 1 Appearance

Note

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

- Type I device is a vari focal device that supports adjusting focus manually via its focus knob. This type device has two kinds of data interfaces, including fast Ethernet and USB.
- Type II and type IV devices are fixed focal device whose focus cannot be adjusted, and type IV device has two kinds of data interfaces, including fast Ethernet and USB.
- Type III device is a vari focal device that adopts vari focal lens to adjust focus.

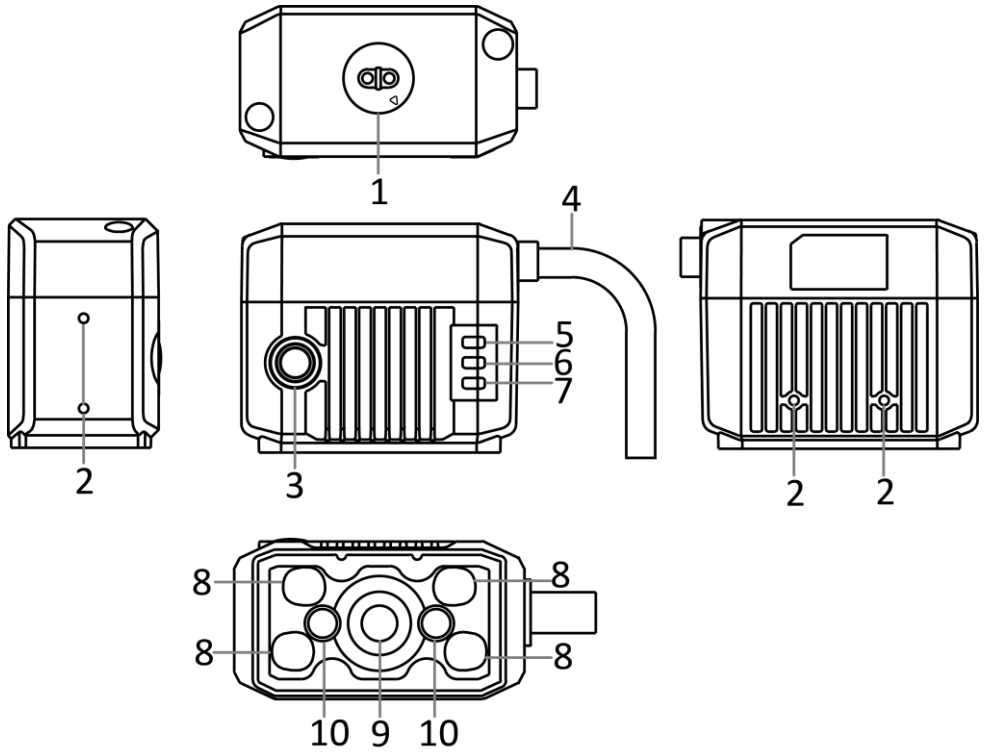

Figure 1-1 Appearance (Type I)

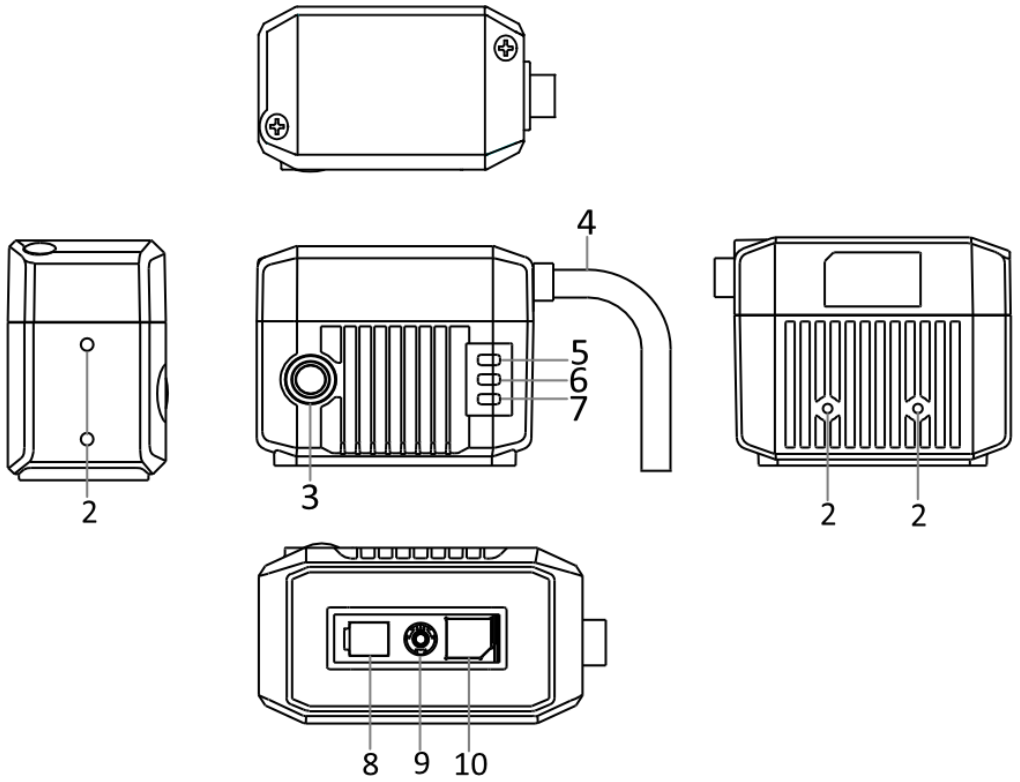

Figure 1-2 Appearance (Type II)

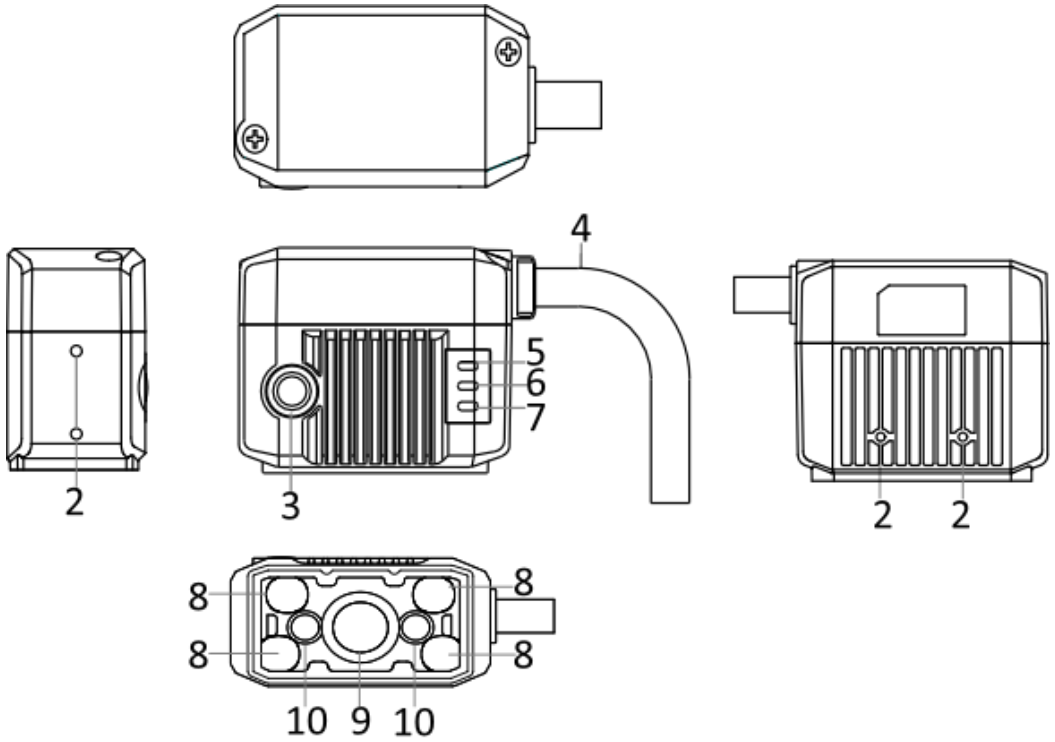

Figure 1-3 Appearance (Type III)

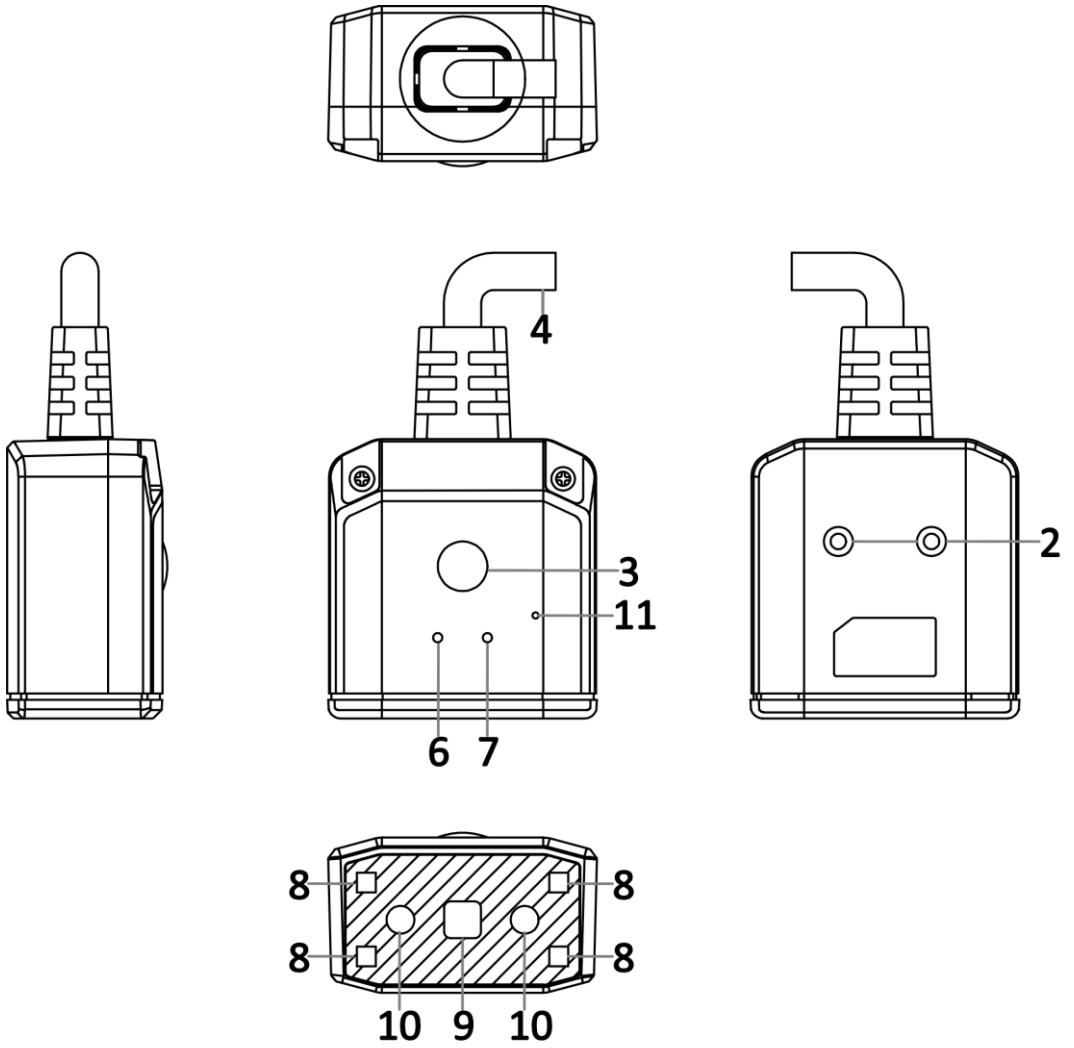

Figure 1-4 Appearance (Type IV)

Table 1-1 Component Description

No.	Name	Description
1	Focus Knob	It is used to adjust focal length manually. **Note** Only type I device has the focus knob.
2	Screw Hole	It is used to fix the device to the installation position. ● For type I, II and III devices, you should use M2 screw. ● For type IV device, you should use M3 screw.
3	Trigger 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.

No.	Name	Description
5	LNK Indicator	It is a network status indicator. The indicator is flashing green when the network transmission is normal. Otherwise, it is unlit. **Note** Type IV device does not have a LNK indicator.
6	Status Indicator	For type I, II and III devices, it is a STS indicator. And for type IV device, it is an OK/NG indicator. ● Regarding STS indicator, it is green when the device operates normally, and it is red when the device is powered on or operation error occurs. ● Regarding OK/NG indicator, it is red when the device is powered on or operation error occurs, and it is unlit when the device operates normally without reading codes. The indicator is green lasting 0.5 s when the device reads codes successfully, and is solid green when the device reads codes continuously.
7	PWR Indicator	It is a power indicator. The indicator is red during the device's power-on process. After the device is powered on, the indicator is green.
8	Light Source	It is the LED light source used to provide light when the device acquires images. **Note** The light source color is different by device models.
9	Sensor	It is used to acquire images.
10	Aiming Light	It helps to indicate the field of view and aim targets.
11	Buzzer	The buzzer beeps three times continuously when the device is powered on, beeps twice when the device reads setting codes successfully, and beeps once when the device reads codes successfully. **Note** Only type IV device has a buzzer.

Chapter 2 Connector and Cable

This section introduces the device's connector on its SR cable and the supplied cable in the package.

Note

The device's connector and connector pin definitions may differ by device models.

2.1 Type I Device with USB Interface

Type I device with USB interface has a 17-pin M12 connector. Refer to the figure and table below for connector pin definitions.

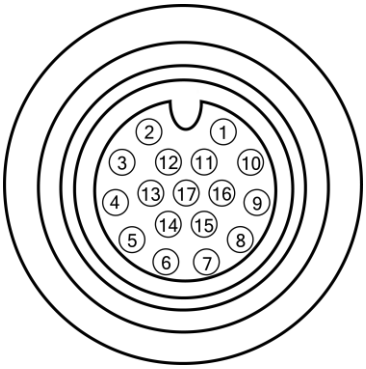

Figure 2-1 17-Pin M12 Connector

Table 2-1 Pin Definitions (Type I Device with USB Interface)

No.	Signal	I/O Signal Source	Description
1	DC_PWR	--	Direct current power supply positive
3	USB_DM	--	USB signal negative
11	GND	--	Direct current power supply negative
12	USB_DP	--	USB signal positive

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

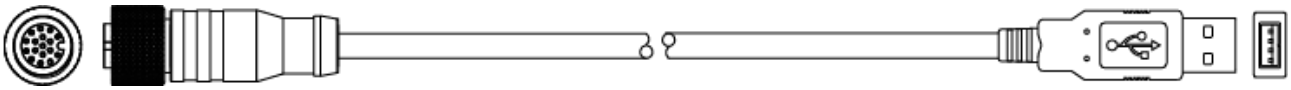

Figure 2-2 17-Pin Cable for Type I Device with USB Interface

2.2 Type I Device with Fast Ethernet Interface and Type II Device

Both type I device with fast Ethernet interface and type II device have a 17-pin M12 connector, but their corresponding connector pin definitions are different. Refer to the figure and table below for details.

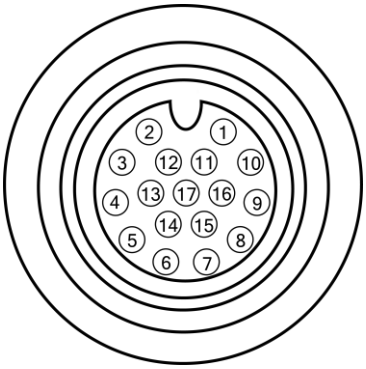

Figure 2-3 17-Pin M12 Connector

Table 2-2 Pin Definitions (Type I Device with Fast Ethernet Interface)

No.	Signal	I/O Signal Source	Description	Supplied Cable
1	DC_PWR	--	Direct current power supply positive	Red open line
2	GND	Line 0/1/2/3-	Direct current power supply negative	Brown open line
3	Reserved			
4	RS232_TX	--	RS-232 serial port output	DB9 female serial port
5	RS232_RX	--	RS-232 serial port input	DB9 female serial port
6	MDI0+	--	Fast Ethernet signal MDI0+	RJ45 Ethernet connector
7	MDI1-	--	Fast Ethernet signal MDI1-	RJ45 Ethernet connector
8	GPIO2	Line 2+	It can be configured as input or output, and is output by default.	Blue/white open line
9	GND	Line 0/1/2/3-	Direct current power supply negative	Blue open line
10	GPIO3	Line 3+	It can be configured as input or output, and is output by default.	Brown/white open line

No.	Signal	I/O Signal Source	Description	Supplied Cable
11	GND	Line 0/1/2/3-	Direct current power supply negative	Black open line
12	Reserved			
13	Reserved			Purple open line
14	MDI0-	--	Fast Ethernet signal MDI0-	RJ45 Ethernet connector
15	MDI1+	--	Fast Ethernet signal MDI1+	RJ45 Ethernet connector
16	GPIO0	Line 0+	It can be configured as input or output, and is input by default.	Gray open line
17	GPIO1	Line 1+	It can be configured as input or output, and is input by default.	White open line

Table 2-3 Pin Definitions (Type II Device)

No.	Signal	I/O Signal Source	Description	Supplied Cable
1	DC_PWR	--	Direct current power supply positive	Red open line
2	OUT_COM	LineOut 0/1 signal ground	Output common port	Brown open line
3	Reserved			
4	RS232TX	--	RS-232 serial port output	DB9 female serial port
5	RS232RX	--	RS-232 serial port input	DB9 female serial port
6	MDI0+	--	Fast Ethernet signal MDI0+	RJ45 Ethernet connector
7	MDI1-	--	Fast Ethernet signal MDI1-	RJ45 Ethernet connector
8	OPTO_OUT0	LineOut 0 signal line	Opto-isolated output 0	Blue/white open line
9	IN_COM	LineIn 0/1 signal ground	Input common port	Blue open line
10	OPTO_OUT1	LineOut 1 signal line	Opto-isolated output 1	Brown/white open line

No.	Signal	I/O Signal Source	Description	Supplied Cable
11	GND	--	Direct current power supply negative	Black open line
12	Reserved			
13	Reserved			Purple open line
14	MDI0-	--	Fast Ethernet signal MDI0-	RJ45 Ethernet connector
15	MDI1+	--	Fast Ethernet signal MDI1+	RJ45 Ethernet connector
16	OPTO_IN0	LineIn 0 signal line	Opto-isolated input 0	Gray open line
17	OPTO_IN1	LineIn 1 signal line	Opto-isolated input 1	White open line

For the type I device with fast Ethernet interface and the type II device, you should use the supplied 17-pin cable below to wire them. 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.

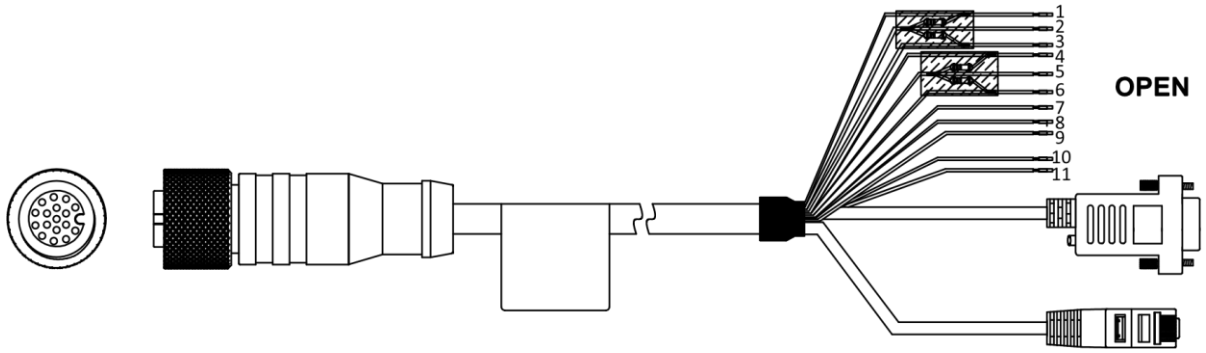

Figure 2-4 17-Pin Cable for Type I Device with Fast Ethernet Interface and Type II Device

Note

- For type I device with fast Ethernet, the pink line in the open line is Line 0/1's pull-up and pull-down resistor, and black/white line in the open line is Line 2/3's pull-up and pull-down resistor.
- For type II device, the pink line in the open line is LineIn 0/1's pull-up and pull-down resistor, and black/white line in the open line is LineOut 0/1's pull-up and pull-down resistor.

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.

2.3 Type III Device

Type III device also has a 17-pin M12 connector. Refer to the figure and table below for connector pin definitions.

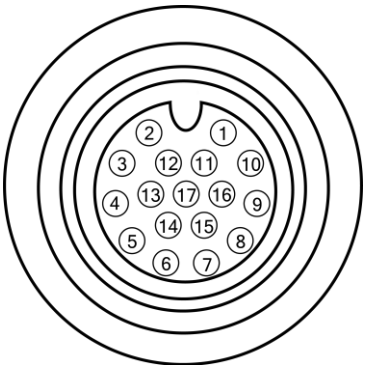

Figure 2-5 17-Pin M12 Connector

Table 2-4 Pin Definitions (Type III Device)

No.	Signal	I/O Signal Source	Description	Supplied Cable
1	DC_PWR	--	Direct current power supply positive	Red open line
2	Reserved			Brown open line
3	Reserved			
4	RS232_TX	--	RS-232 serial port output	DB9 female serial port
5	RS232_RX	--	RS-232 serial port input	DB9 female serial port
6	MDI0+	--	Fast Ethernet signal MDI0+	RJ45 Ethernet connector
7	MDI1-	--	Fast Ethernet signal MDI1-	RJ45 Ethernet connector
8	GPIO2	Line 2+	Non-isolated input	Blue/white open line
9	GND	--	--	Blue open line
10	GPIO3	Line 3+	Non-isolated output	Brown/white open line
11	GND	Line 0/1/2/3-	Direct current power supply negative	Black open line
12	Reserved			

No.	Signal	I/O Signal Source	Description	Supplied Cable
13	Reserved			Purple open line
14	MDI0-	--	Fast Ethernet signal MDI0-	RJ45 Ethernet connector
15	MDI1+	--	Fast Ethernet signal MDI1+	RJ45 Ethernet connector
16	GPIO0	Line 0+	It can be configured as input or output, and is input by default.	Gray open line
17	GPIO1	Line 1+	It can be configured as input or output, and is input by default.	White open line

For the type III device, you should use the supplied 17-pin cable below to wire the 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.

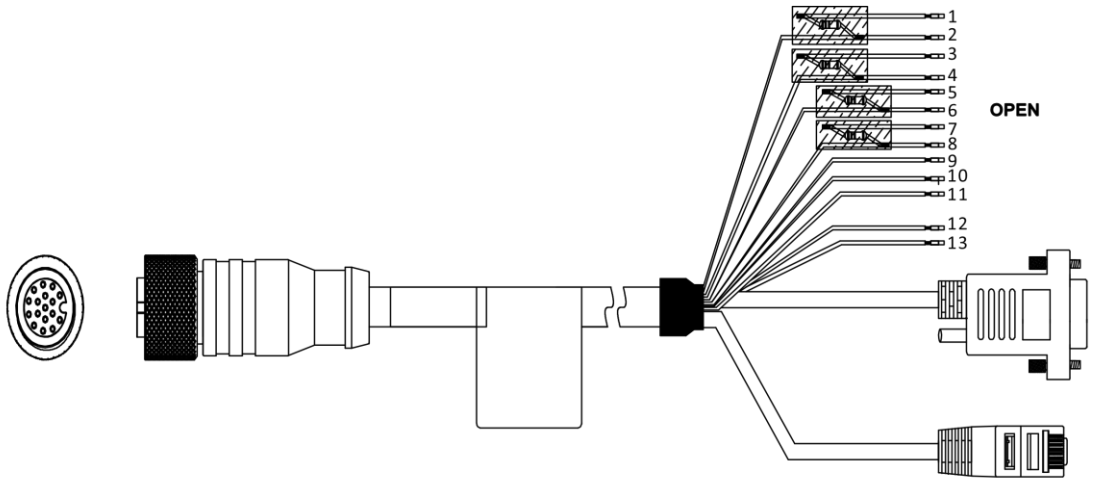

Figure 2-6 17-Pin Cable for Type III Device

Note

For type III device, black/white line in the open line is Line 0's pull-up and pull-down resistor, pink line is Line 1's pull-up and pull-down resistor, orange line is Line 2's pull-up and pull-down resistor, and purple/white line is Line 3's pull-up and pull-down resistor.

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.

2.4 Type IV Device with Fast Ethernet Interface

Type IV device with fast Ethernet interface has a DB15 connector. Refer to the figure and table below for connector pin definitions.

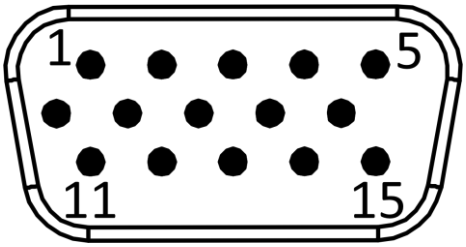

Figure 2-7 DB15 Connector

Table 2-5 Pin Definitions (Type IV Device with Fast Ethernet Interface)

No.	Signal	I/O Signal Source	Description	Supplied Cable
1	POWER_IN	--	Direct current power supply positive	DB9 male serial port
2	RS232_TX	--	RS-232 serial port output	DB9 male serial port
3	RS232_RX	--	RS-232 serial port input	DB9 male serial port
4	GND	Line 0/1/2/3-	Direct current power supply negative	6-pin terminal
5	OPTO_IN0	LineIn 0+	Non-isolated input 0	6-pin terminal
6	TX+	--	Fast Ethernet signal TX+	RJ45 Ethernet connector
7	RX-	--	Fast Ethernet signal RX-	RJ45 Ethernet connector
8	OPTO_OUT	LineOut 2+	Non-isolated output 2	6-pin terminal
9	Reserved			
10	IO_2	LineOut 3+	Non-isolated output 3	6-pin terminal
11	Reserved			
12	Reserved			
13	IO_1	LineIn 1+	Non-isolated input 1	6-pin terminal
14	TX-	--	Fast Ethernet signal TX+	RJ45 Ethernet connector

No.	Signal	I/O Signal Source	Description	Supplied Cable
15	RX+	--	Fast Ethernet signal RX-	RJ45 Ethernet connector

For the type IV device with fast Ethernet interface, you should use the supplied cable, as shown below, to wire the device. The cable has a DB9 female serial port that corresponds to 1st, 2nd, and 3rd pins of the device's DB15 connector, and a 6-pin terminal that corresponds to 4th, 5th, 8th, 10th, and 13th pins of the device's DB15 connector, and a RJ45 connector that corresponds to 6th, 7th, 14th, and 15th pins of the device's DB15 connector.

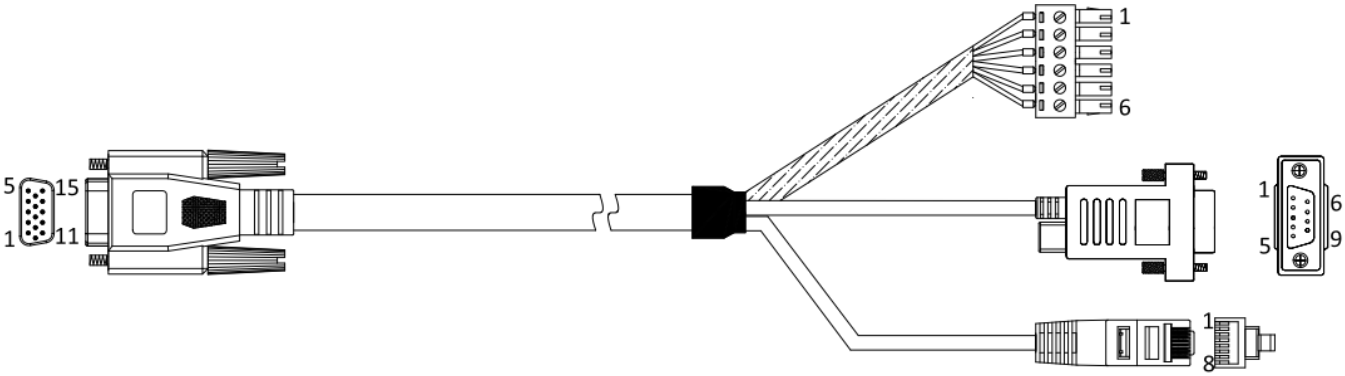

Figure 2-8 Cable for Type IV Device with Fast Ethernet Interface

Refer to the table below for the pin definitions of the 6-pin terminal.

Table 2-6 Pin Definitions (6-Pin Terminal)

No.	Description
1	LINEIN 0
2	LINEOUT 2
3	LINEOUT 3
4	LINEIN 1
5	GND
6	VCC **Note** The device uses VCC to power external devices.

Note

The DB9 female serial port of the supplied cable has a 12 V power head via which you can power the device.

2.5 Type IV Device with USB Interface

Type IV device with USB interface also has a DB15 connector. Refer to the figure and table below for connector pin definitions.

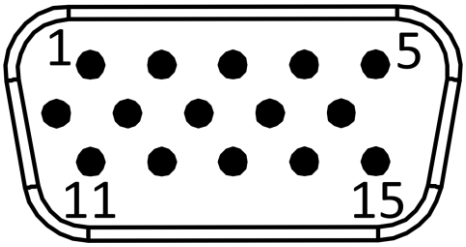

Figure 2-9 DB15 Connector

Table 2-7 Pin Definitions (Type IV Device with USB Interface)

No.	Signal	I/O Signal Source	Description
4	GND	--	Direct current power supply negative
9	POWER_5IVN	--	USB power interface
11	USB_DM	--	USB2.0 signal negative
12	USB_DP	--	USB2.0 signal positive

For the type IV device with USB interface, you should use the supplied cable, as shown below, to wire the device. The cable has a 15-pin connector for connecting with the device, and a USB interface for connecting with the PC.

Figure 2-10 Cable for Type IV Device with USB Interface

Chapter 3 Electrical Feature and I/O Wiring

3.1 Electrical Feature and Wiring of Type I, III and IV Devices

- Type I device has four bi-directional I/O (Line 0/1/2/3).
- Type III device has two bi-directional I/O (Line 0/1), one input (Line 2), and one output (Line 3).
- Type IV device has two inputs (LineIn 0/1), two outputs (LineOut 2/3).

3.1.1 Input Signal

The internal circuit of the device's none-isolated input signal is as follows.

Figure 3-1 Internal Circuit of Input Signal

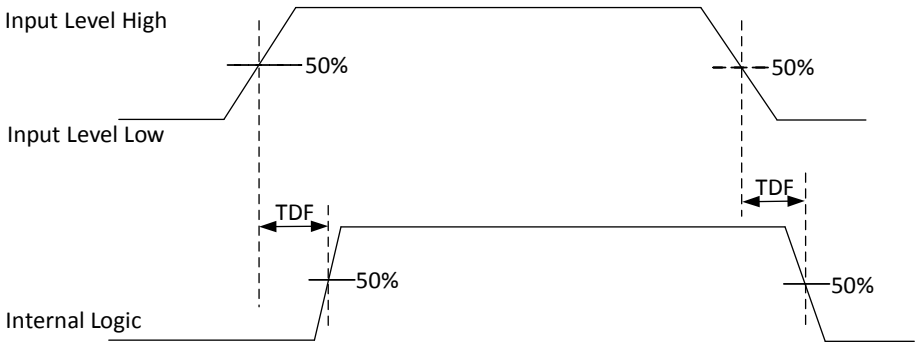

Figure 3-2 Input Logic Level

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 μs

3.1.2 Output Signal

The internal circuit of the device's none-isolated output signal is as follows.

Figure 3-3 Internal Circuit of Output Signal

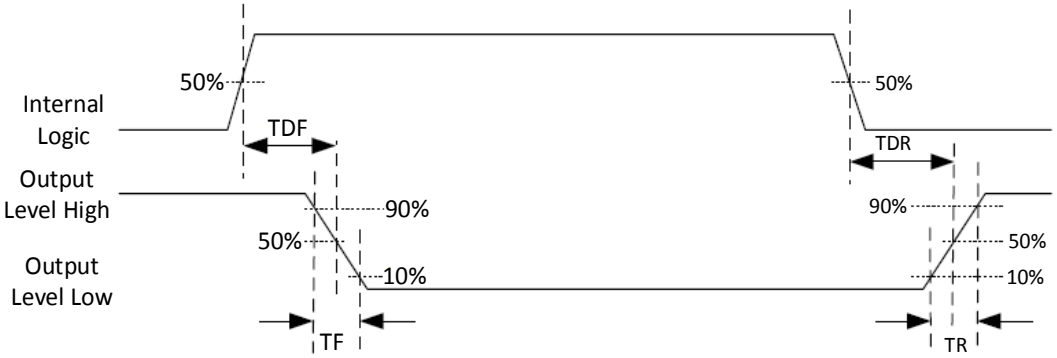

Figure 3-4 Output Logic Level

When the external voltage is 12 VDC and pull-up resistor is 1 KΩ, 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 µs
Output Falling Time	TF	116 ns
Output Rising Time	TR	3.8 µs

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

External Voltage	Output Logic Level Low (VL)
12 VDC	500 mV
24 VDC	900 mV

3.1.3 Bi-Directional Signal

The type I device has four bi-directional I/O (Line 0/1/2/3) and the type III device has two bi-directional I/O (Line 0/1). You can set them as input signal or output signal according to demands.

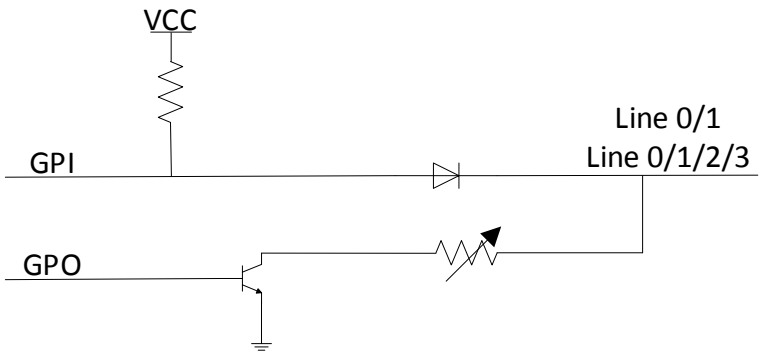

Figure 3-5 Internal Circuit of Bi-Directional Signal

Configured as Input Signal

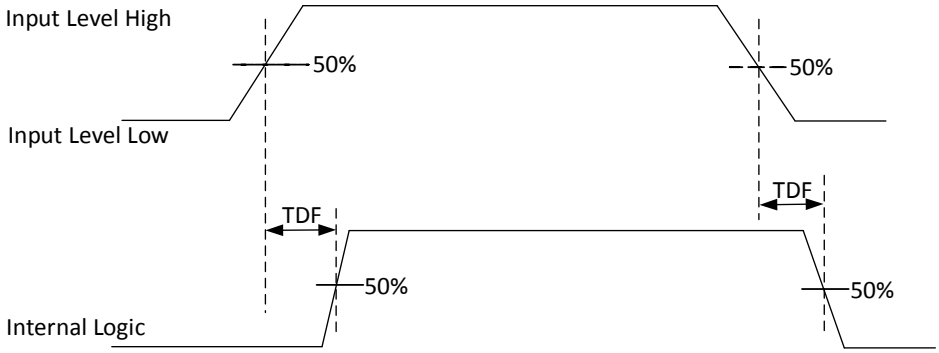

Figure 3-6 Input Logic Level

Table 3-4 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

Parameter Name	Parameter Symbol	Value
Input Rising Delay	TDR	1 μs

Configured as Output Signal

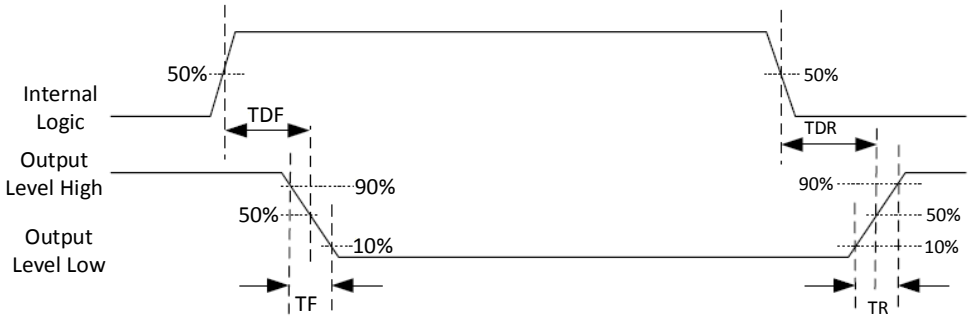

Figure 3-7 Output Logic Level

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

Table 3-5 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 μs
Output Falling Time	TF	116 ns
Output Rising Time	TR	3.8 μs

Relation between different external voltages and output logic level low is shown below.

Table 3-6 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

3.1.4 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 of type I and type III has pull-up and pull-down resistors, and type IV device's supplied cable does not have pull-up and pull-down resistors. Here we take type I device as an example for introducing input signal wiring.
- 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.

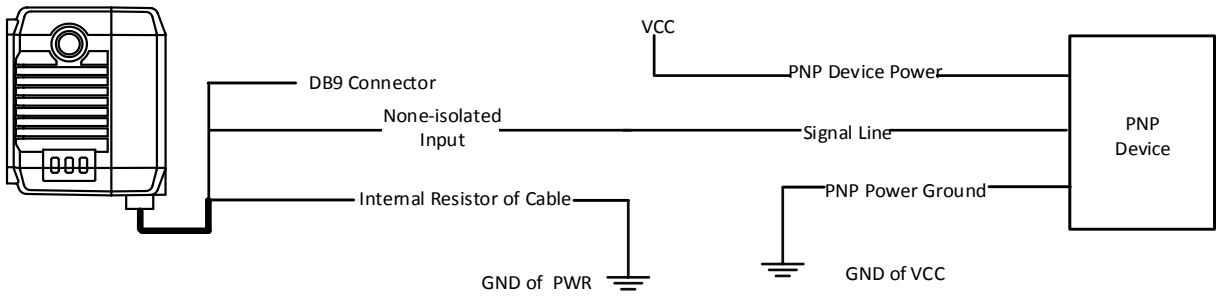

Figure 3-8 Input Signal Connecting to PNP Device (Pull-Down Resistor of 17-Pin Cable Used)

If you use external pull-down resistor, it is recommended to use 1 KΩ pull-down resistor.

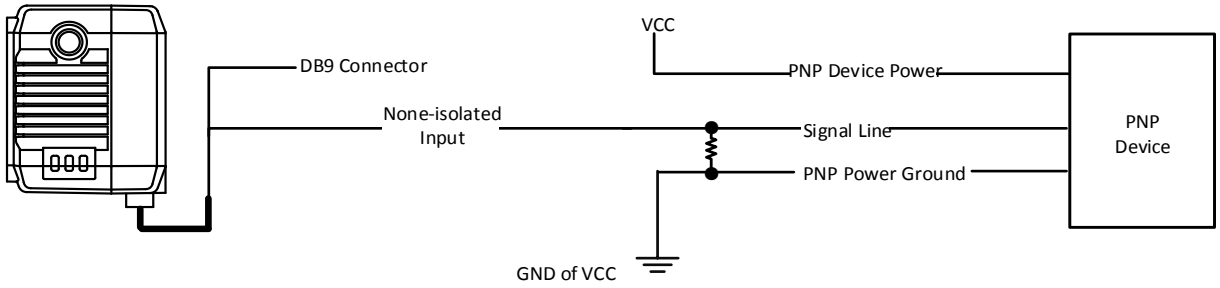

Figure 3-9 Input Signal Connecting to PNP Device (External Pull-Down Resistor Used)

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.

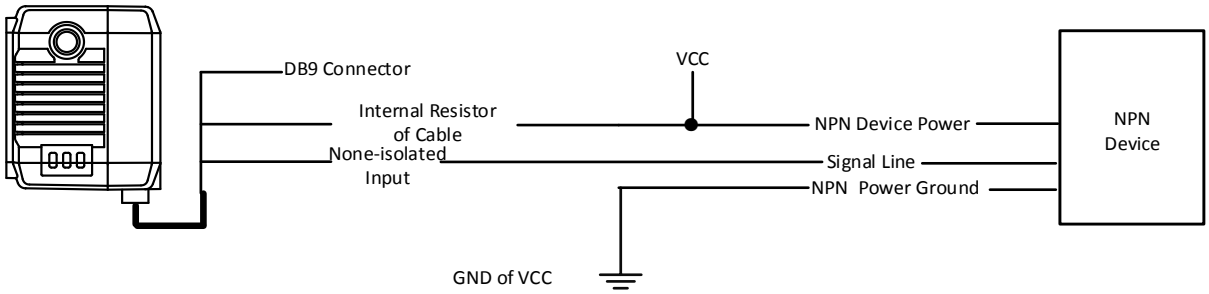

Figure 3-10 Input Signal Connecting to NPN Device (Pull-Up Resistor of 17-Pin Cable Used)

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 KΩ pull-up resistor.

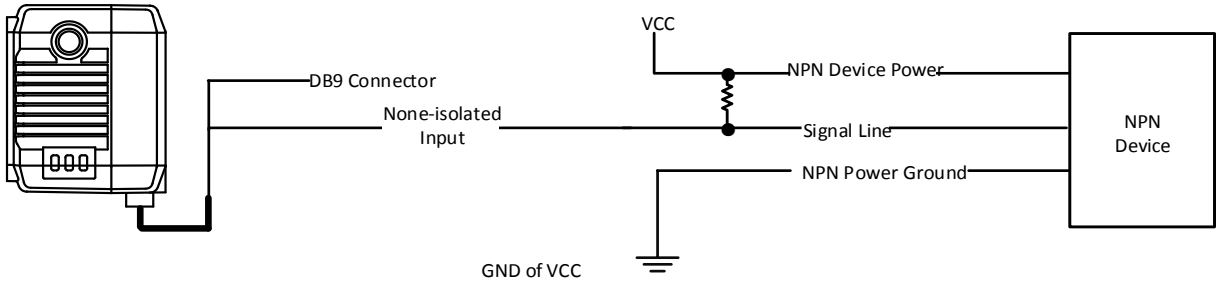

Figure 3-11 Input Signal Connecting to NPN Device (External Pull-Up Resistor Used)

Switch

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

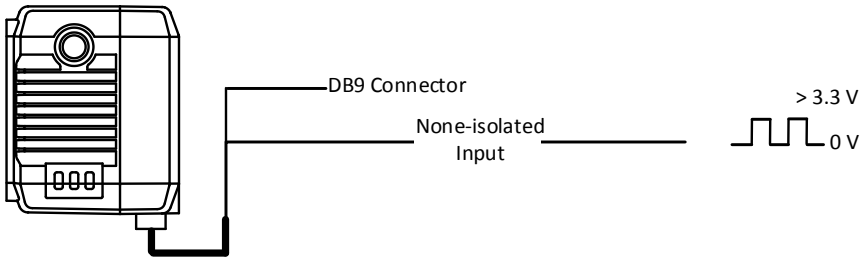

Figure 3-12 Input Signal Connecting to Switch

3.1.5 Output Signal Wiring

Note

- Output signal wiring may differ by external device types.
- The supplied 17-pin cable of type I and type III has pull-up and pull-down resistors, and type IV device's supplied cable does not have pull-up and pull-down resistors. Here we take type I device as an example for introducing output signal wiring.
- The voltage of VCC should be equal to or less than that of PWR. Otherwise, the output signal exception may occur.

PNP Device

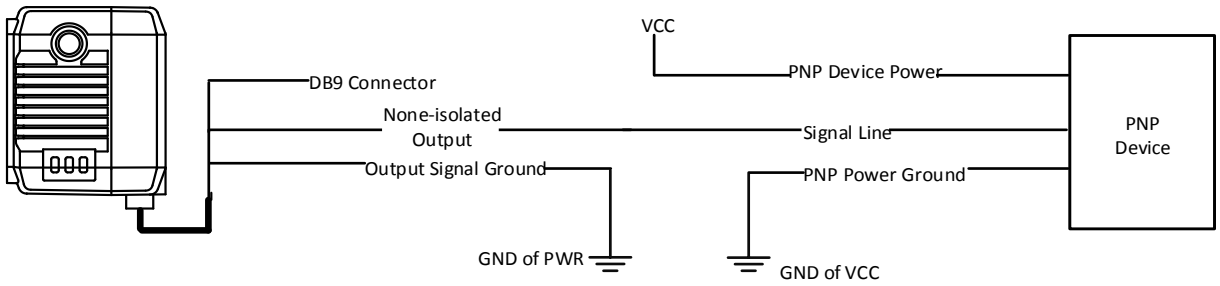

Figure 3-13 Output Signal Connecting to PNP Device

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.

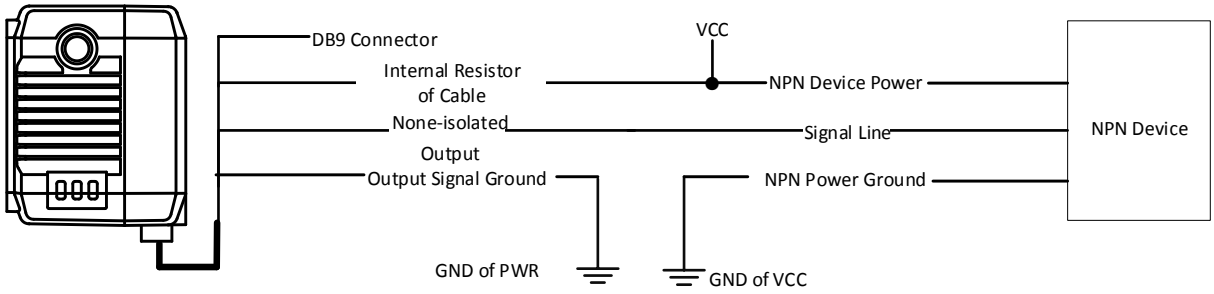

Figure 3-14 Output Signal Connecting to NPN Device (Pull-Up Resistor of 17-Pin Cable Used)

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 KΩ pull-up resistor.

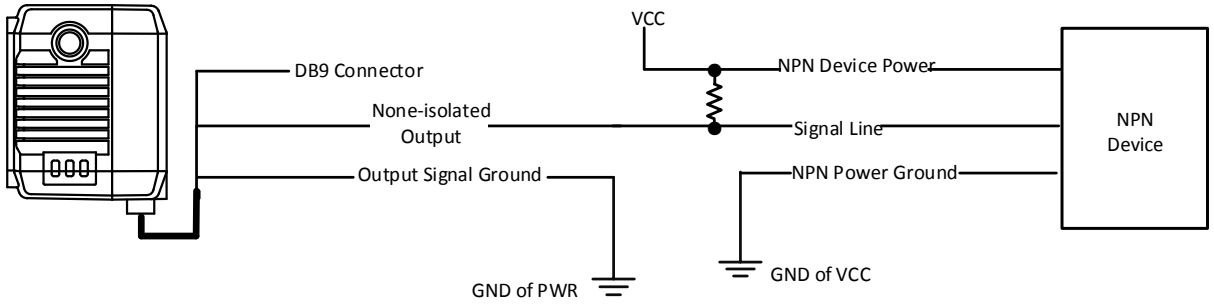

Figure 3-15 Output Signal Connecting to NPN Device (External Pull-Up Resistor Used)

3.2 Electrical Feature and Wiring of Type II 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.

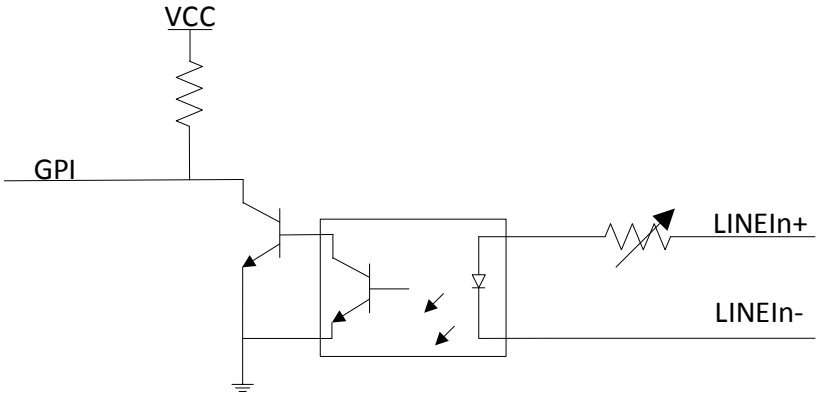

Figure 3-16 Internal Circuit of Input Signal

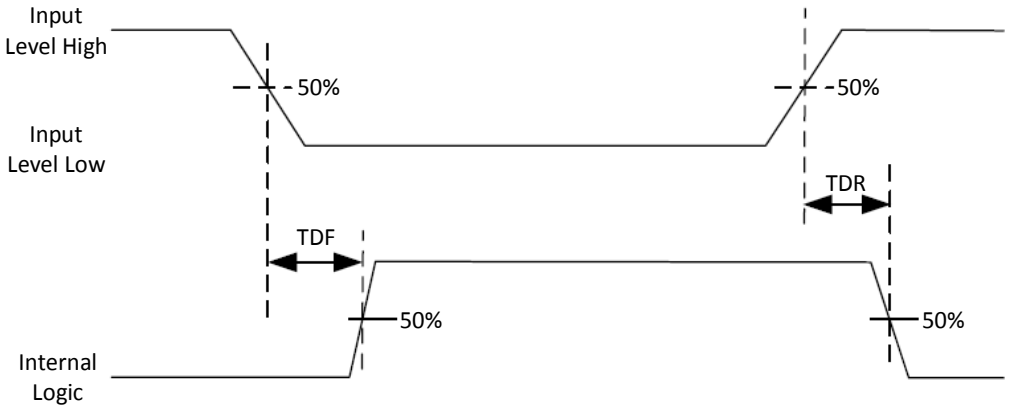

Figure 3-17 Input Logic Level

Table 3-7 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 μs
Input Rising Delay	TDR	7 μs

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.

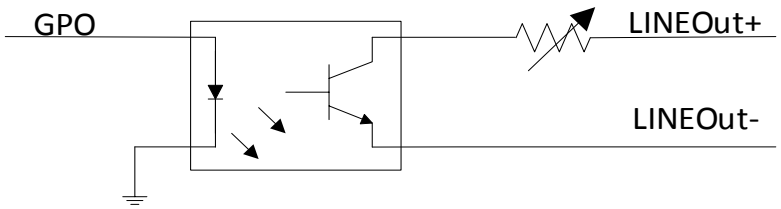

Figure 3-18 Internal Circuit of Output Signal

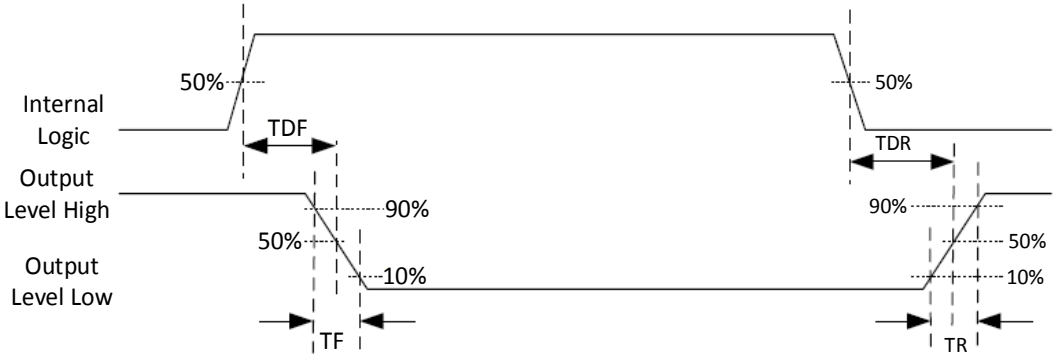

Figure 3-19 Output Logic Level

Table 3-8 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 μs
Output Rising Delay	TDR	68 μs
Output Falling Time	TF	3 μs
Output Rising Time	TR	60 μs

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

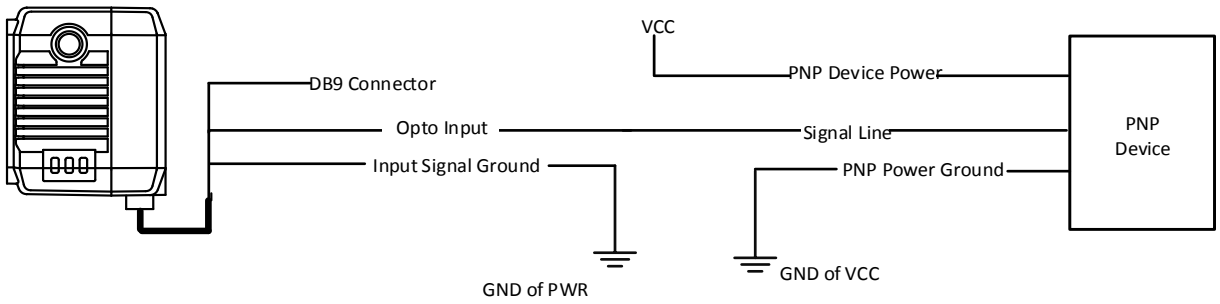

Figure 3-20 Input Signal Connecting to PNP Device

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.

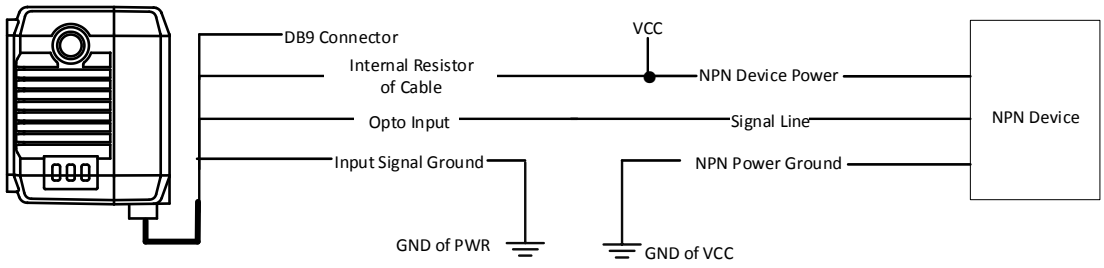

Figure 3-21 Input Signal Connecting to NPN Device (Pull-Up Resistor of 17-Pin Cable Used)

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 KΩ pull-up resistor.

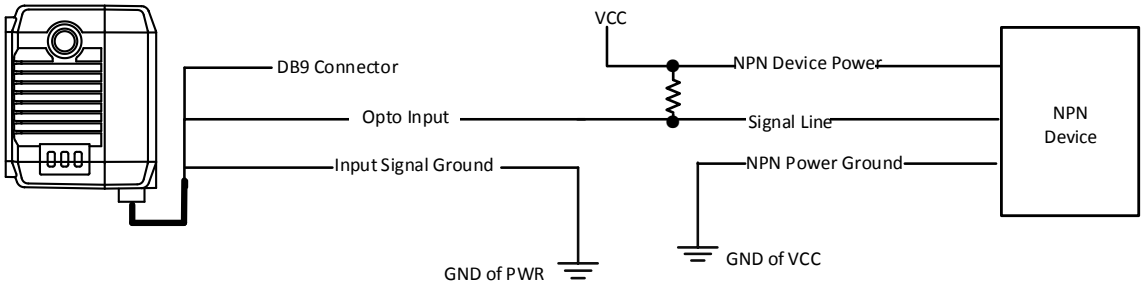

Figure 3-22 Input Signal Connecting to NPN Device (External Pull-Up Resistor Used)

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

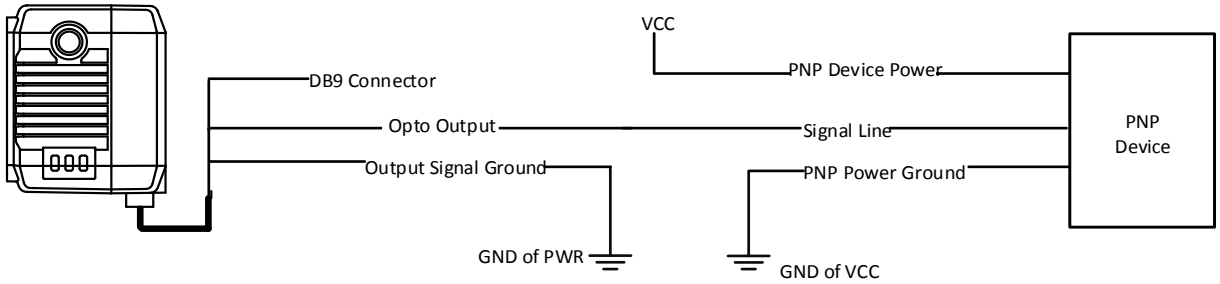

Figure 3-23 Output Signal Connecting to PNP Device

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.

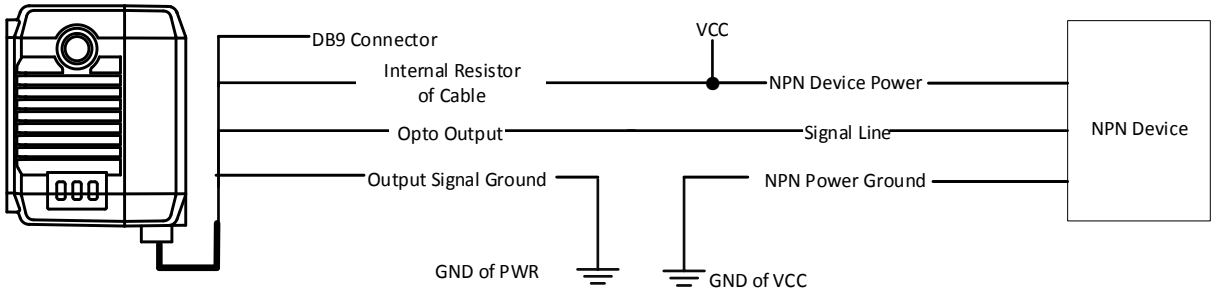

Figure 3-24 Output Signal Connecting to NPN Device (Pull-Up Resistor of 17-Pin Cable Used)

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 KΩ pull-up resistor.

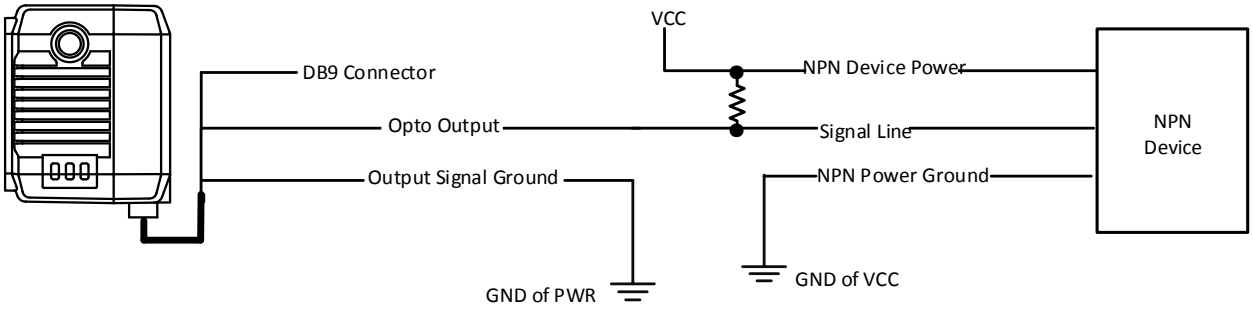

Figure 3-25 Output Signal Connecting to NPN Device (External Pull-Up Resistor Used)

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.

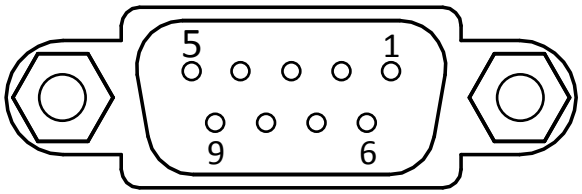

Figure 3-26 9-Pin Connector

Table 3-9 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	Cable	1	It refers to the supplied cable that is included in the package. Refer to section ***Connector and Cable*** for details.
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 screws that are used to fix the device to the installation position.

4.2 Install Device

Before You Start

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

Steps

1. Use supplied screws to fix the device to the installation position.
2. Use the supplied cable to wire the device.
- For type I device with USB Interface, connect the 17-pin M12 connector of the cable to the device, and connect the USB interface of the cable to the PC.
- For type I device with fast Ethernet interface, type II device and type III device, connect the 17-pin M12 connector of the cable to the device, insert RJ45 connector of the 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 type I device with USB interface, connect the 17-pin M12 connector of the cable to the device, and connect the USB interface of the cable to the PC.

Note

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

- For type IV device with fast Ethernet interface, connect the device to the supplied cable via the DB15 connector, insert RJ45 connector of the 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 type IV device with USB interface, connect the device to the supplied cable via the DB15 connector, and connect the USB interface of the cable to the PC.

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.
- It is recommended to install the latest version of the client software, and you can contact the sales personnel to get the installation package.
- 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**.

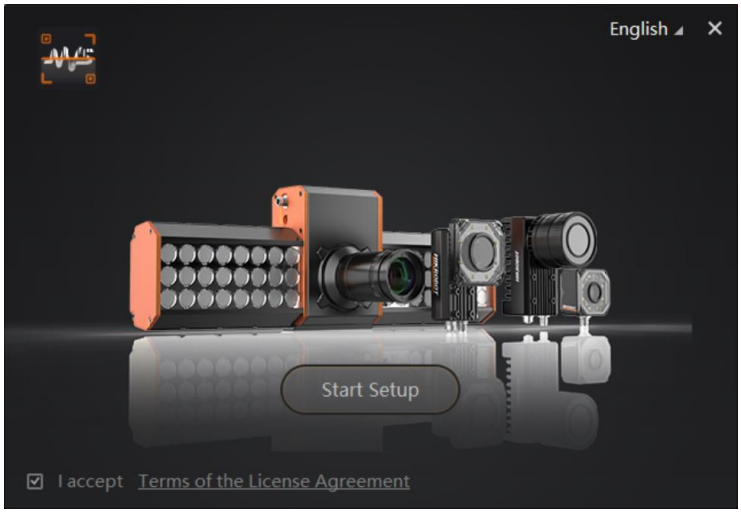

Figure 5-1 Installation Interface

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)**.

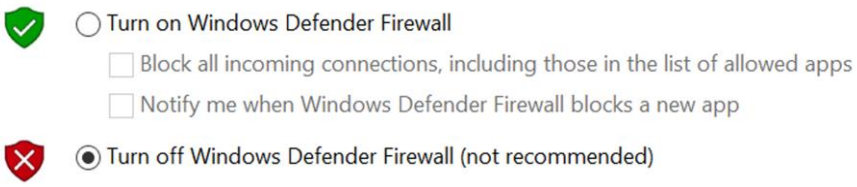

Figure 5-2 Windows Defender Firewall

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.

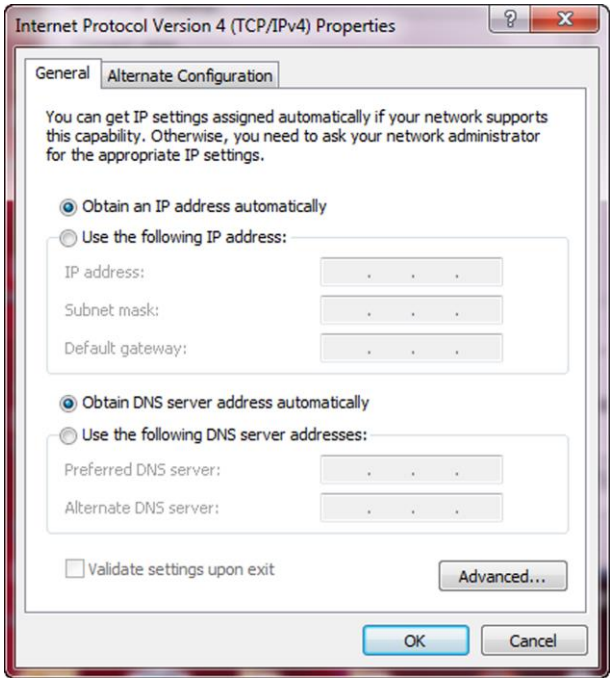

Figure 5-3 Set PC Network

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.

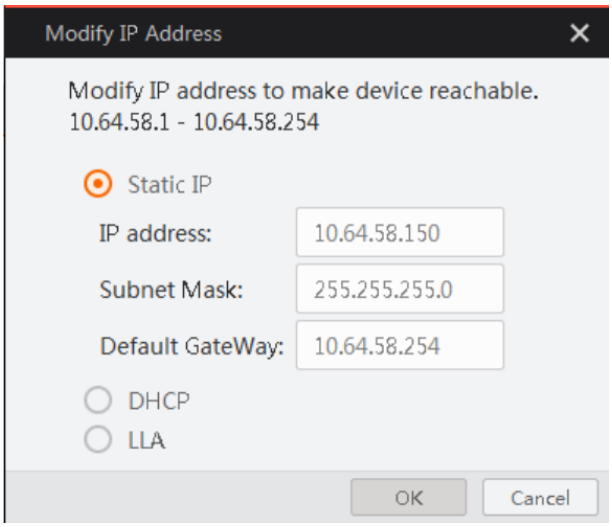

Figure 5-4 Modify IP Address

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.

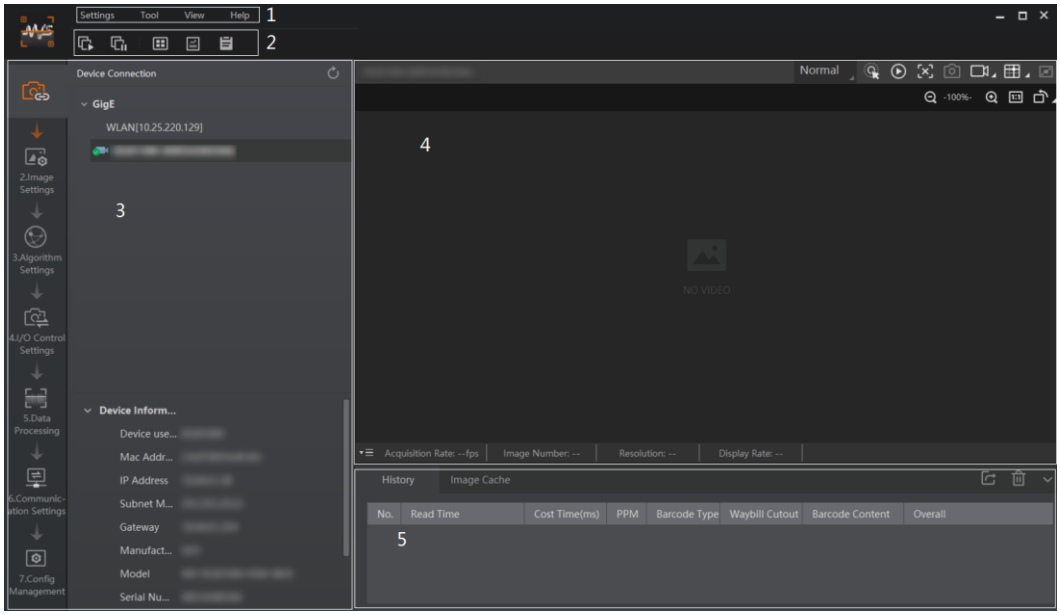

Figure 6-1 Main Window

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 **Settings**, **Tool**, **View**, and **Help**.
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.

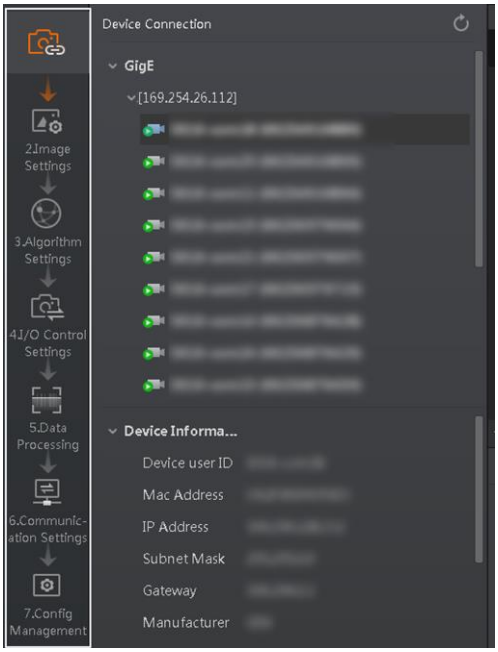

Figure 6-2 Device Configuration Area

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.

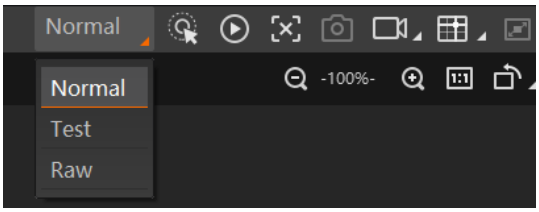

Figure 7-1 Select Device Mode

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 (type I device only) or via auto focus function (type III 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.

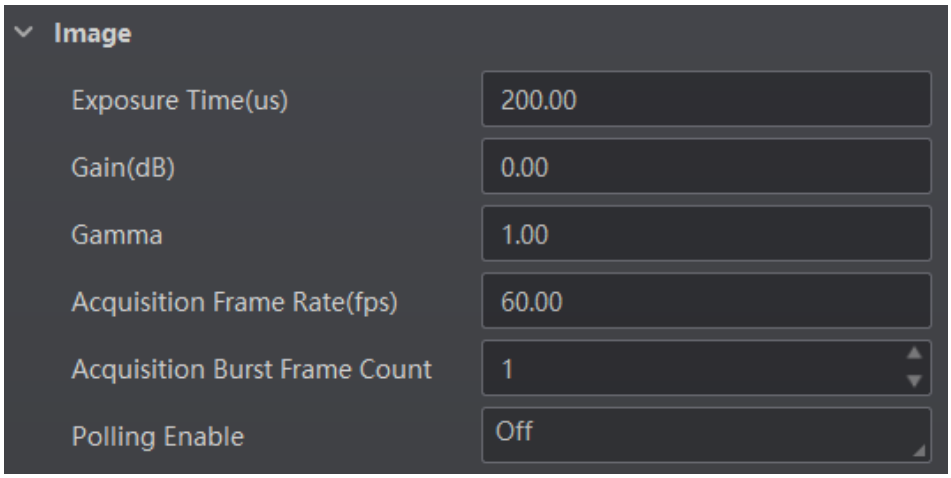

Figure 8-1 Set Image

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, light source, focus position, etc. 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 and specific parameters may differ by device models.
- It is recommended to use the polling function under the normal device mode, and test/raw modes are used for debugging only.

Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to **Image Setting** → **Polling Enable**, and select **Single** as **Polling Enable**.
3. Select one parameter (e.g. **Param1**) from **Polling Param**.
4. Set **Polling Exposure Time**, **Polling Gain**, and **Polling Gamma** according to actual demands.
5. (Optional) Enable **Polling Lighting Enable** according to actual demands.
6. (Optional) Enable **Polling Focus Enable**, and set **Polling Focus Pos**, and **Polling Focus Temp** according to actual demands.

- Polling Focus Pos: It sets the focus position of the polling.
- Polling Focus Temp: It displays the device's current temperature when setting the focus position.

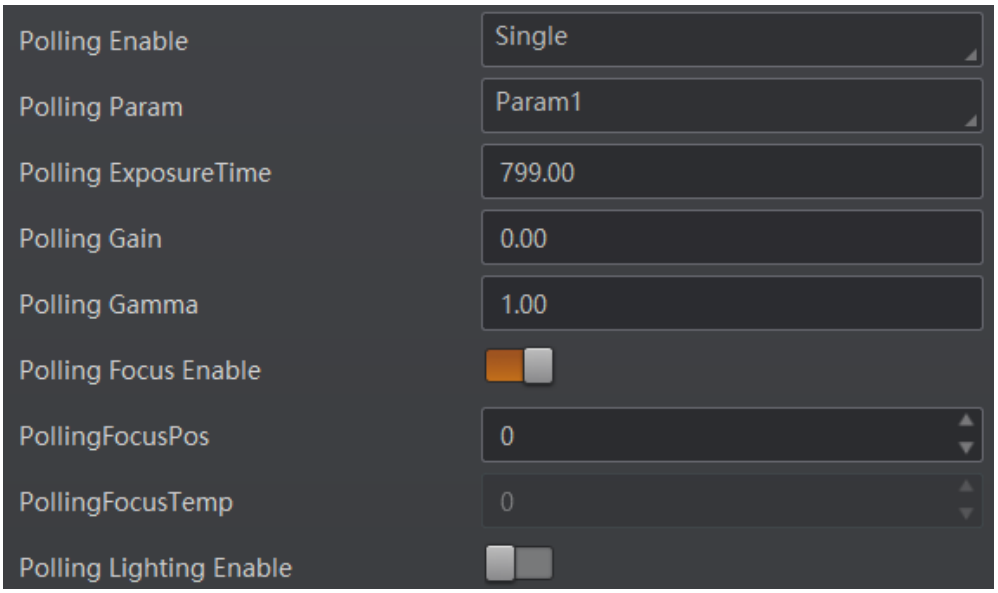

Figure 8-2 Single Mode

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. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to **Image Setting** → **Polling Enable**, and select **Multiple** as **Polling Enable**.
3. Set **Polling Time** and **Polling Period** according to actual demands.
4. 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.
5. Set **Polling Exposure Time**, **Polling Gain**, and **Polling Gamma** according to actual demands.
6. (Optional) Enable **Polling Lighting Enable** according to actual demands.
7. (Optional) Enable **Polling Focus Enable**, and set **Polling Focus Pos**, and **Polling Focus Temp** according to actual demands.

- Polling Focus Pos: It sets the focus position of the polling.
- Polling Focus Temp: It displays the device's current temperature when setting the focus position.

8. Repeat step 4 to step 7 to set other parameters from **Polling Param**.

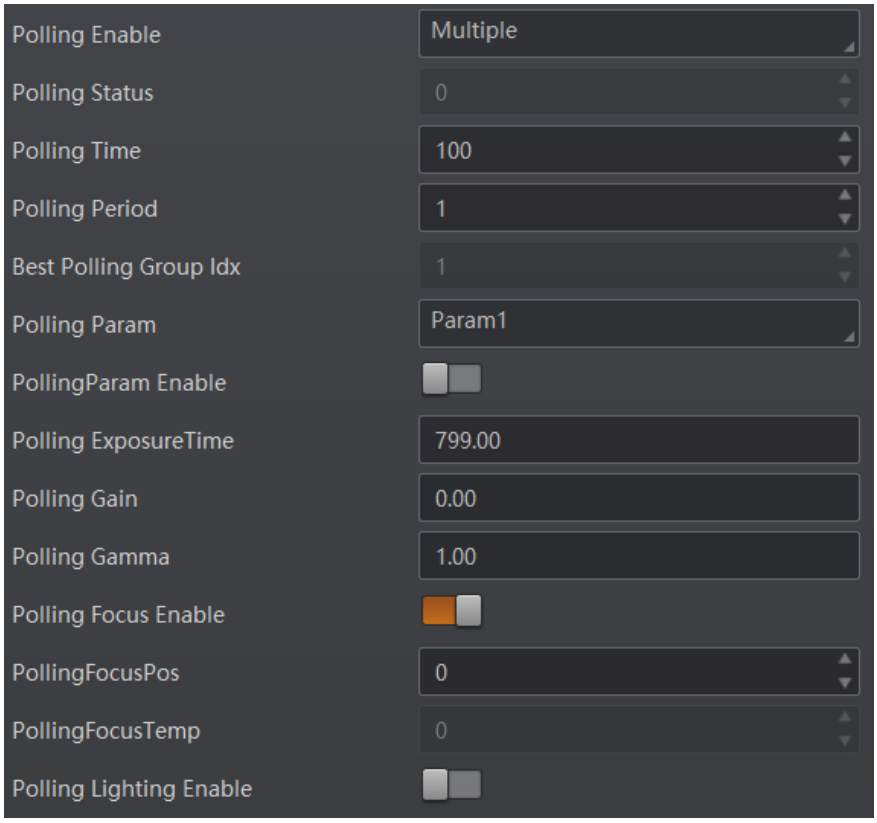

Figure 8-3 Multiple Mode

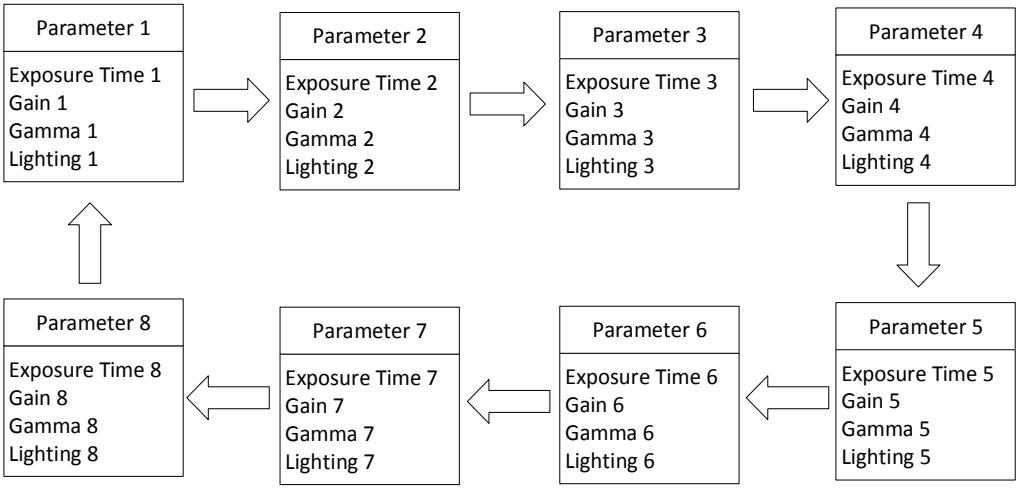

Figure 8-4 Polling Diagram

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 selected the device to be set in **Device Connection** before setting light source parameters.

Steps

1. Go to **Image Settings** → **Light**, and enable **Aiming Light Enable** according to actual demands.
2. Enable **Lighting Enable** to enable the light source according to actual demands.
3. (Optional) Set **Lighting Duration** and **Precharge Time** if **Lighting Enable** is enabled.

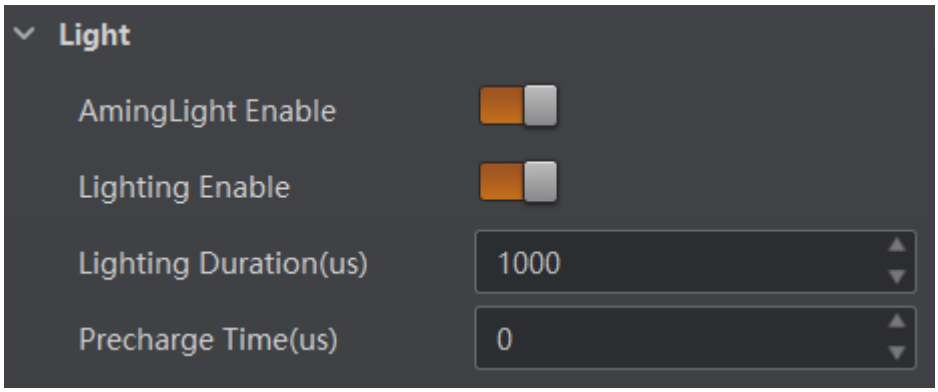

Figure 8-5 Set Light Source

8.1.4 Set Lens Focus

The type III device adopts the high-speed vari focal lens, and it can complete single focus adjustment in 5 ms. The device also supports focus adjustment via external devices, and it is applicable to the mixed line production.

The type III device supports setting lens focus via the client software, and two ways are available to set lens focus, including auto focus and manual focus.

Note

- The lens focus function may differ by device models.
- Setting the device mode as **Test** is required before setting lens focus. After completion, you should set the device mode as **Normal**.

Auto Focus

Steps

1. Click  in the live view window.

2. Right click the device in **Device Connection**, and click **Feature Tree**.
3. Go to **Focus Control** → **Auto Config**, and select the focus mode according to actual demands.
- Full Auto: In this mode, the device will automatically change parameters like focus position, exposure, gain, Gamma and light source when adjusting focus.
- Motor Only: In this mode, the device will change focus position only when adjusting focus.
- Auto and Restore: In this mode, the device will automatically change parameters like focus position, exposure, gain, Gamma and light source when adjusting focus, and keep focus position and restore other parameters after completing focus adjustment.
4. Go to **Image Settings** → **Auto Focus**, click **Execute** in **Focus Mode**, and the device starts to adjust focus automatically.

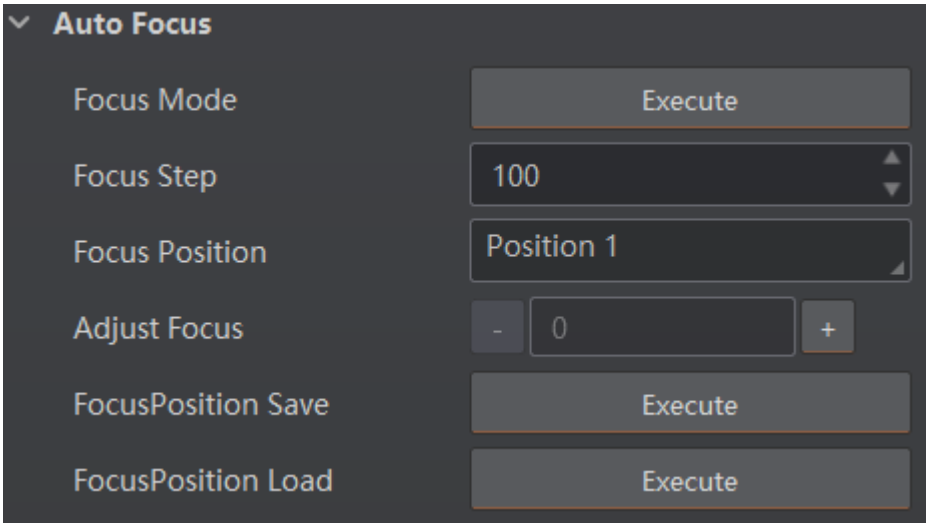

Figure 8-6 Auto Focus

5. (Optional) Select the position parameter from **Focus Position**, and click **Execute** in **Focus Position Save** to save the focus position after adjusting focus.
6. (Optional) Select the position parameter from **Focus Position**, and click **Execute** in **Focus Position Load** to load saved focus position according to actual demands.

Manual Focus

Steps

1. Click in the live view window.
2. Right click the device in **Device Connection**, and click **Feature Tree**.
3. Go to **Focus Control** → **Auto Config**, and select the focus mode according to actual demands.
- Full Auto: In this mode, the device will automatically change parameters like focus position, exposure, gain, Gamma and light source when adjusting focus.
- Motor Only: In this mode, the device will change focus position only when adjusting focus.
- Auto and Restore: In this mode, the device will automatically change parameters like focus position, exposure, gain, Gamma and light source when adjusting focus, and keep focus position and restore other parameters after completing focus adjustment.
4. Go to **Image Settings** → **Auto Focus**, and set **Focus Step** according to actual demands.

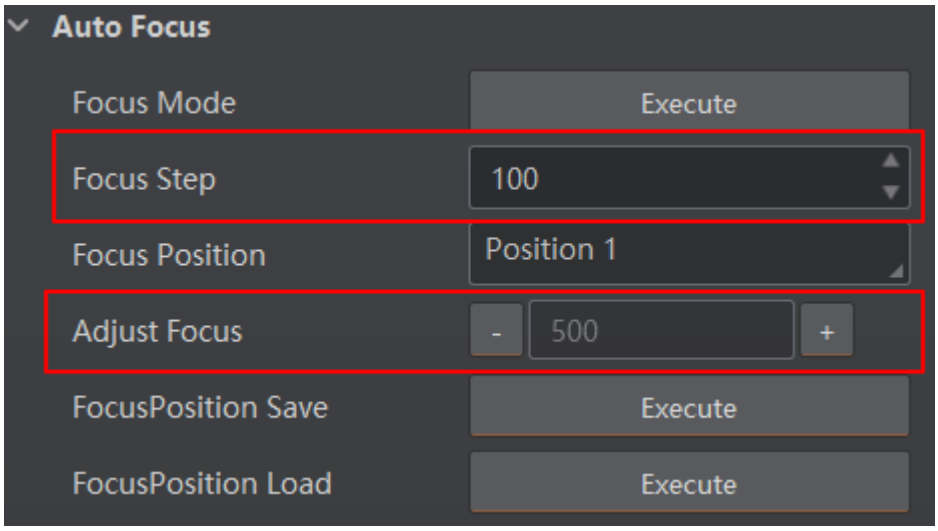

Figure 8-7 Manual Focus

5. Observe image clarity in the live view widow, and click - or + in **Adjust Focus** to adjust focus according to actual demands.
6. (Optional) Select the position parameter from **Focus Position**, and click **Execute** in **Focus Position Save** to save the focus position after adjusting focus.
7. (Optional) Select the position parameter from **Focus Position**, and click **Execute** in **Focus Position Load** to load saved focus position according to actual demands.

Adjust Focus via External Devices

Follow steps below to adjust lens focus via external devices.

Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to **Focus Control** → **Label Focus Enable**, and enable **Label Focus Enable**.
3. Set **Focus Label** and **Focus Label Source** according to actual demands.

- Focus Label: It sets the trigger command to adjust focus.
- Focus Label Source: It sets the trigger source of adjusting focus, including TCP, UDP, and Serial.

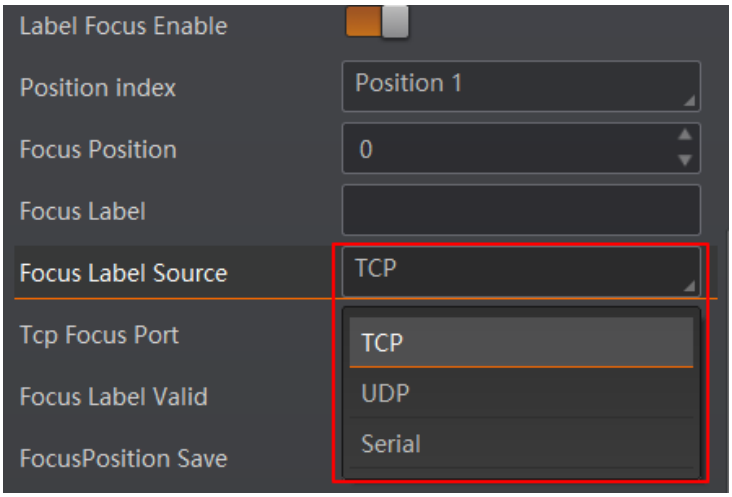

Figure 8-8 Adjust Focus via External Devices

4. (Optional) Set **TCP Focus Port** if **TCP** is selected as **Focus Label Source**.

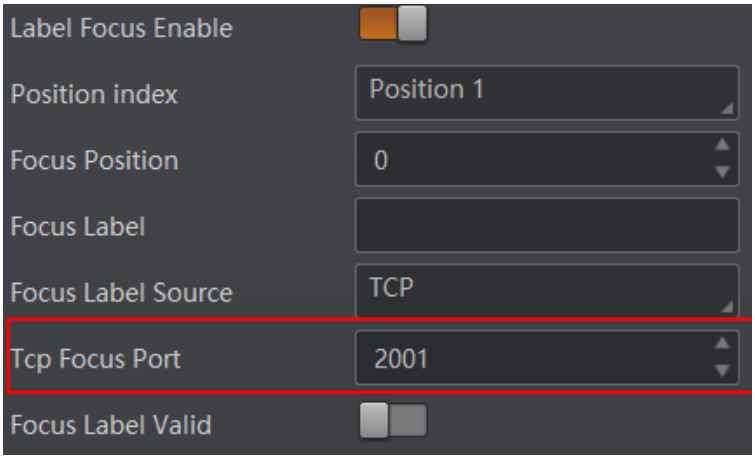

Figure 8-9 Set TCP Focus Port

5. (Optional) Set **UDP Focus Port** if **UDP** is selected as **Focus Label Source**.

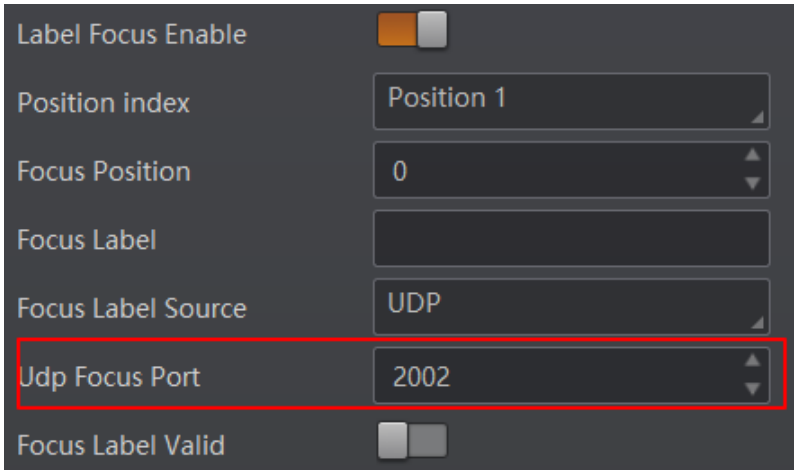

Figure 8-10 Set UDP Focus Port

6. (Optional) Set **Serial Baudrate**, **Serial Data Bits**, **Serial Parity**, and **Serial Stop Bits** if **Serial** is selected as **Focus Label Source**.

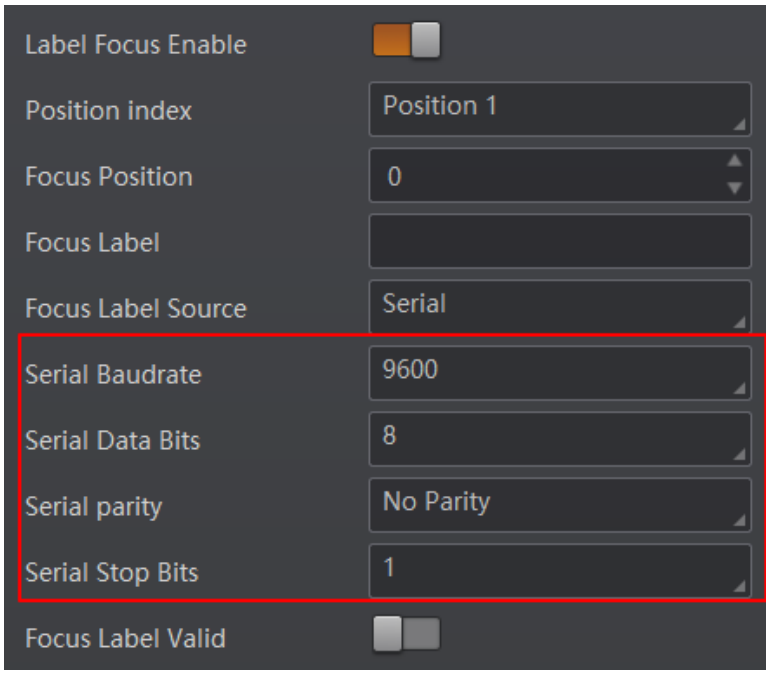

Figure 8-11 Serial Related Parameters

7. Enable **Focus Label Valid** after settings, and external devices can control the device to adjust focus via sending trigger commands.
8. (Optional) You can view the device's focus adjustment times via **Focus Times**.

8.1.5 Set Self-Adaptive Adjustment

Note

This function may differ by device models.

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

Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to **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.
3. Select **Param Source** according to actual demands.

- Default Param: It adjusts the default parameters.
- Polling Param: It adjusts parameters configured in polling. After **Polling Param** is selected as **Param Source**, you can select polling parameter group from **Polling Param**, and enable **Apply Polling Focus** to adjust polling focus according to actual demands.

4. (Optional) Enable or disable **Self Adapt Lighting Enable** during self-adaptive adjustment. If it is enabled, the client software will select the best one from all lighting options during the self-adaptive adjustment. If it is disabled, the client software will keep the lighting status before the self-adaptive adjustment.
5. (Optional) Set **Self Adapt Gain Max** or **Self Adapt Exposure Max** according to actual demands.
   - Self Adapt Gain Max: It is enabled in high quality mode, and it sets the max. gain during the self-adaptive adjustment.
   - Self Adapt Exposure Max: It is enabled in high speed mode, and it sets the max. exposure during the self-adaptive adjustment.
6. (Optional) You can set **Adjust Timeout** to set the duration of the self-adaptive adjustment, and the adjustment will stop if the duration is exceeded. The unit of **Adjust Timeout** is second.
7. Click **Execute** in **Adjust Start**. The device will automatically acquire images and perform self-adaptive adjustment, and stop acquisition after adjustment is completed.

Note

If the adjustment completed, the client software displays the spent time and prompts adjustment succeeded. If the adjustment failed or is timeout, the client software prompts adjustment failure or timeout.

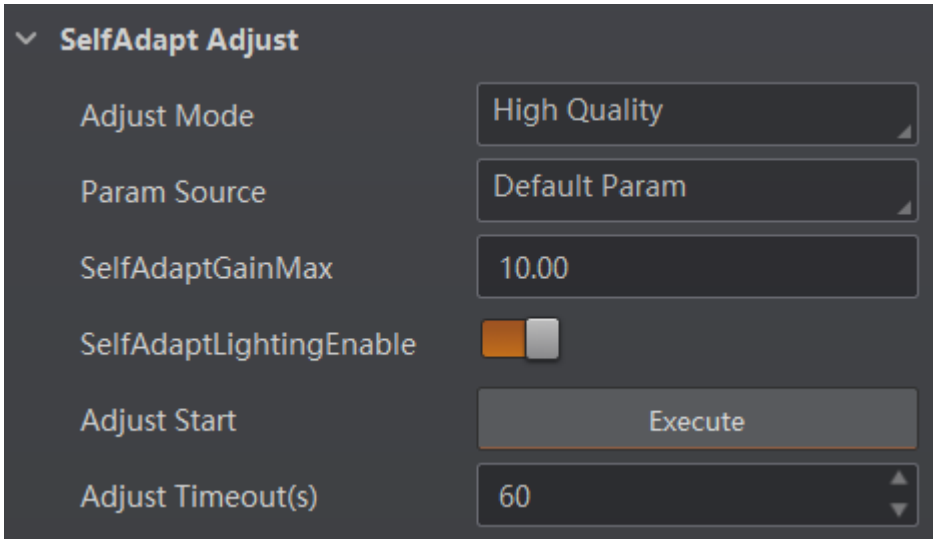

Figure 8-12 Set Self-Adaptive Adjustment

8.1.6 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.

8.1.7 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.

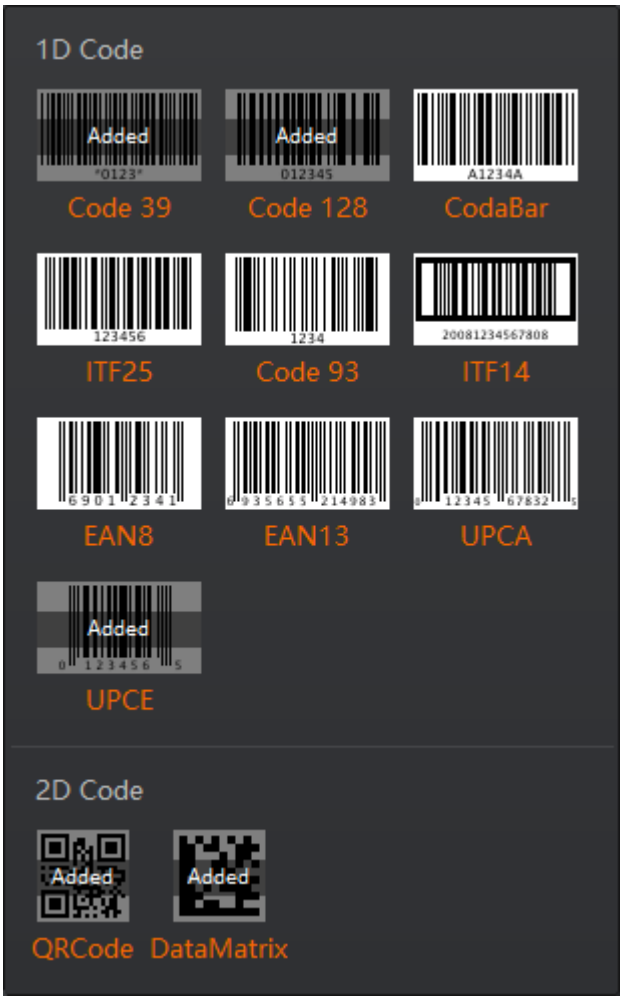

Figure 8-13 Add Codes

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. The client software supports drawing single group of ROI, drawing ROI in batch, and drawing ROI via chessboard.

Note

- If no code is recognized in the algorithm ROI, and the device will output “noread”.
- Before drawing ROIs, make sure that there are images in the live view window after stopping preview.
- 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. Click **Draw** to draw ROI in the live view window.
3. (Optional) Repeat the above step to draw multiple ROIs according to actual demands.

Note

The client software only parse codes in the ROI you drawn.

4. (Optional) Set other ROI parameters according to actual demands.
- ROI Section: It displays section range of the current ROI, and every 30 ROIs as a section.
- ROI Selector: It indicates the ROI number of the current one.
- 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.

Note

The result of Draw ROI Width plus Draw ROI Offset X cannot be larger than the overall horizontal resolution, and the result of Draw ROI Height plus Draw ROI Offset Y cannot be larger than the overall vertical resolution.

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.

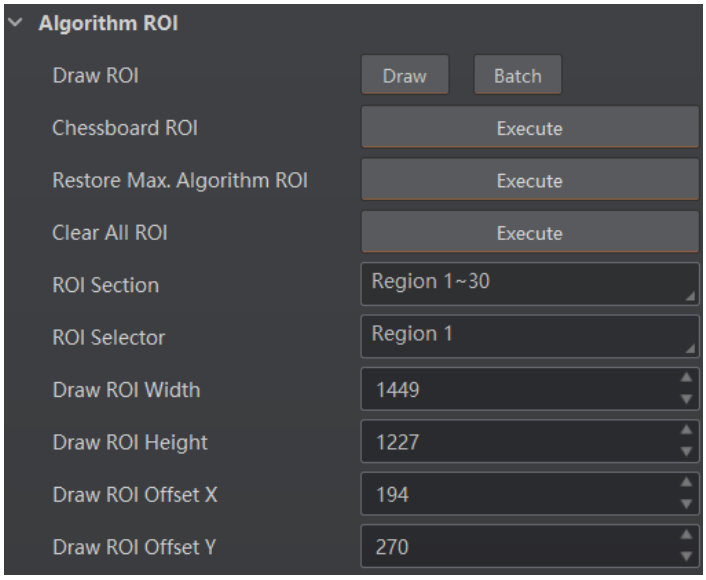

Figure 8-14 Draw Single Group of ROI

Draw ROI in Batch

Steps

1. Go to **Algorithm Settings**, click **All Features**, and find **Algorithm ROI**.
2. Click **Batch** to set parameters according to actual demands.
- Area Offset: It sets the pixel quantity from the starting point when the ROI is in horizontal and vertical direction from the full resolution.
- Area Size: It sets the pixel quantity in the horizontal and vertical direction of the ROI.
- ROI Number: It sets the row and column quantity.
- Row Spacing: It sets the interval between rows.
- Column Spacing: It sets the interval between columns.
3. Click **OK** after settings.
4. Repeat other optional steps mentioned in drawing single group of ROI according to actual demands.

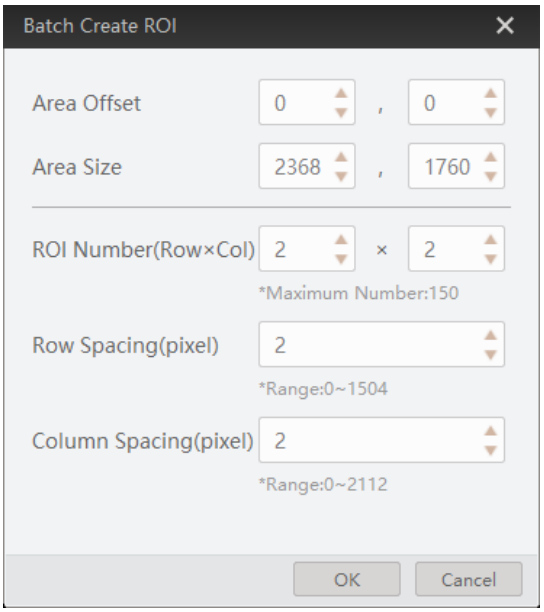

Figure 8-15 Draw ROI in Batch

Draw ROI via Chessboard

Steps

1. Go to **Algorithm Settings**, click **All Features**, and find **Algorithm ROI**.
2. Click **Execute** in **Chessboard ROI**, set parameters according to actual demands, and click **OK** after setting.

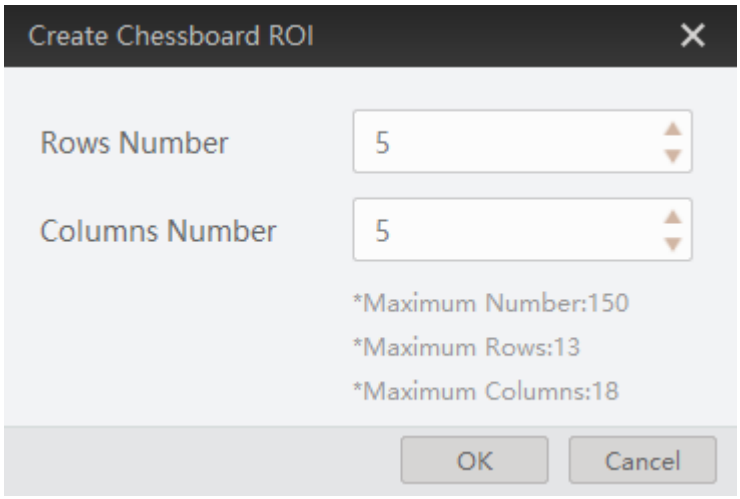

Figure 8-16 Create Chessboard ROI

3. Click ☑ after creating ROI, and the red frame becomes green as shown below.

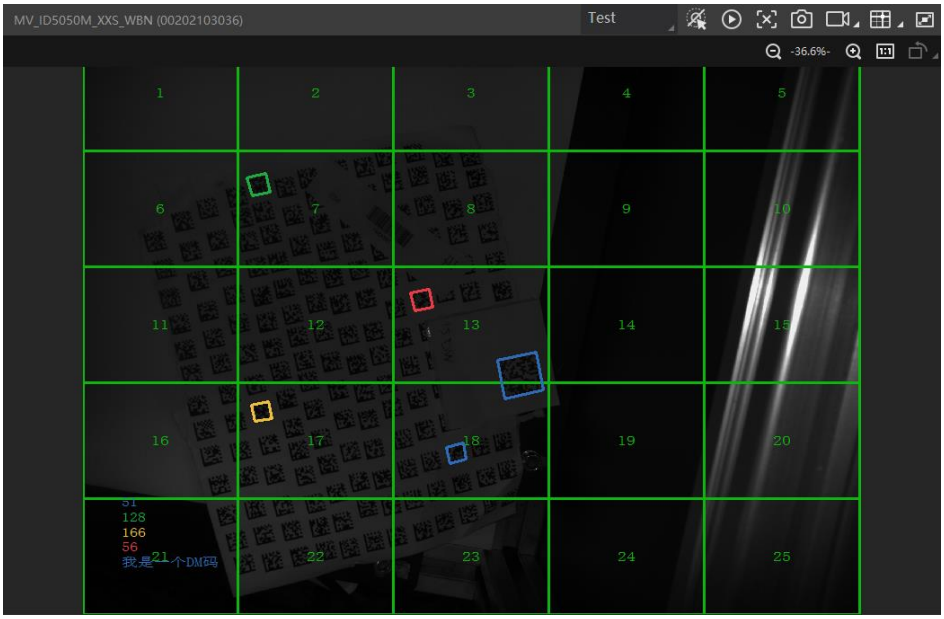

Figure 8-17 Draw ROI via Chessboard

4. (Optional) Click ⊞ to restore the ROI to the full screen, and click ☒ to clean all configured ROIs.
5. Repeat other optional steps mentioned in drawing single group of ROI according to actual demands.

Note

The figures above are for reference only, and refer to the actual conditions.

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.

Code Color

It defines the readable code color. **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.

Code 39 Check

Enable this parameter if Code 39 uses the parity bit.

Note

You need to select **Code 39** in **Add Barcode**.

ITF 25 Check

Enable this parameter if ITF 25 uses the parity bit.

Note

You need to select **ITF 25** in **Add Barcode**.

Code Score 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.

Accurate Timeout Enable

If it is enabled, the accuracy of algorithm timeout will improve.

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 8-18 White QR Code

Figure 8-19 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 8-20 White DM Code

Figure 8-21 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.

DM Code Type

It includes **All**, **ECC140**, and **ECC200**.

2D Code Quality Enable

Refer to section ***Set 2D Code Quality Evaluation*** for details.

Code Score 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.

Accurate Timeout Enable

If it is enabled, the accuracy of algorithm timeout will improve.

8.2.5 Set 2D Code Quality Evaluation

After **2D Code Quality 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 demands, and the default type is **Type 1**. Type 1 has a strong capacity to locate codes.
2. Set **Iso Edition**, including Iso15415 and Iso29158
- Iso15415 is applicable to the quality evaluation for label 2-dimensional codes.
- Iso29158 is applicable to the quality evaluation for DPM format 2-dimensional codes.
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.
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.

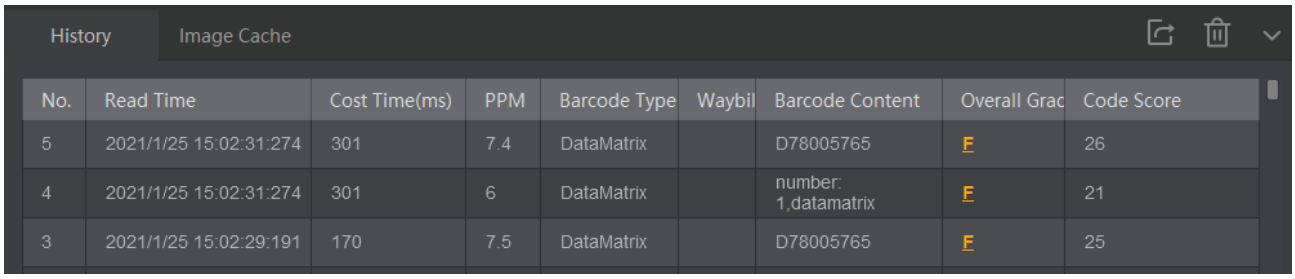

Figure 8-22 2D Code Quality Evaluation

Note

The overall grade includes A, B, C, D and F. A means that the code quality is the best while F means that the code quality is the worst.

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.

- The code score is determined by two factors including image quality and print quality of codes. The range of code score is between 0 and 100, and the higher the score, and easier the code can be read.

Steps

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

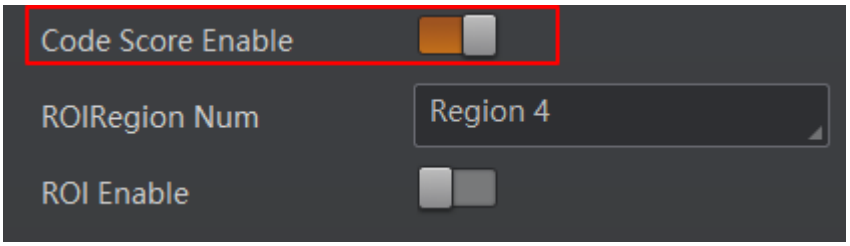

Figure 8-23 Enable Code Score

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

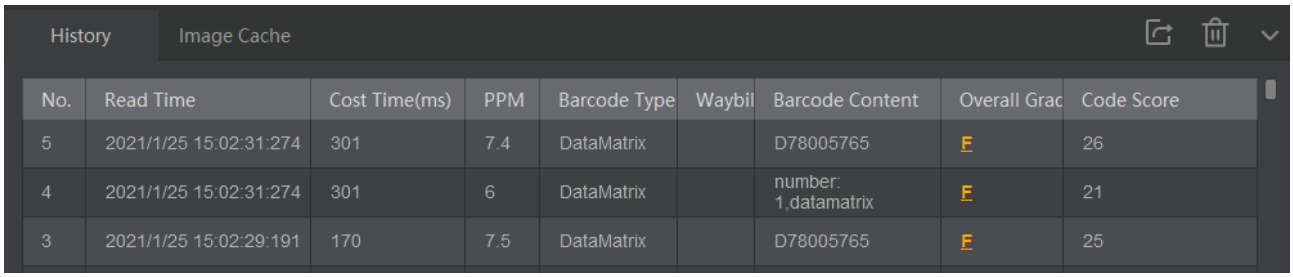

Figure 8-24 Code Score

4. (Optional) Go to **Image Settings**, and adjust parameters like exposure time, gain, Gamma, light source, etc. if the code score is low.

Note

If the code score is still low after adjusting, and the code may have poor printing quality.

8.3 Line Mode Settings

Line mode settings allow you to customize the specific line as input or output according to actual demands.

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.
- If the device has 4 bi-directional I/Os, and Line 0 and Line 1 are input, and Line 2 and Line 3 are

output by default.

- 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.

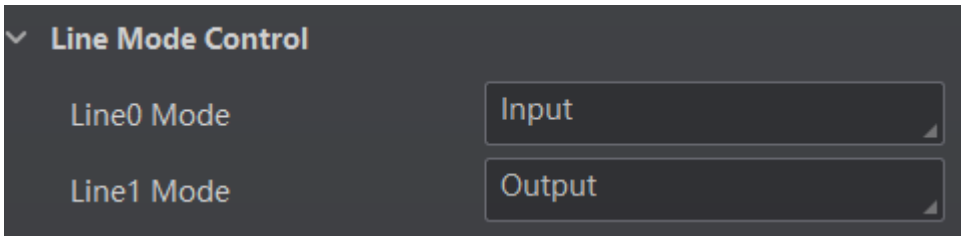

Figure 8-25 Set Line Mode

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 trigger button 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.

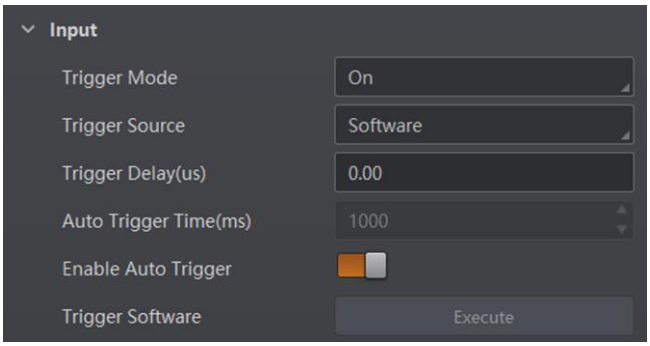

Figure 8-26 Set and Execute Software Trigger Mode

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.

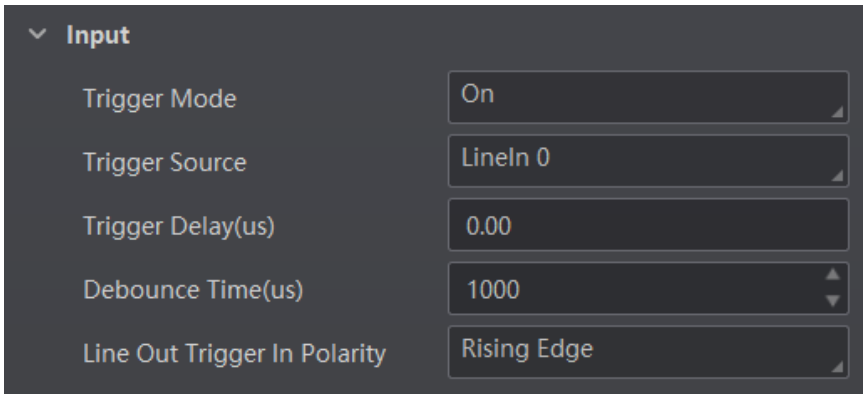

Figure 8-27 Set and Execute Hardware Trigger Mode

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.

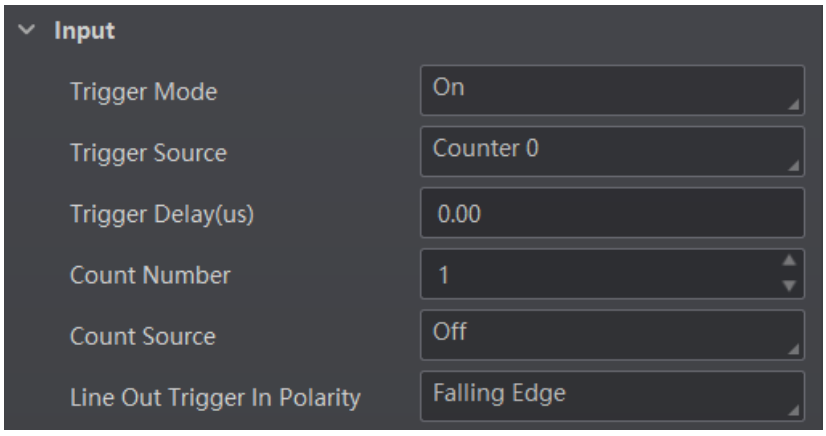

Figure 8-28 Set and Execute Counter Trigger Mode

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.

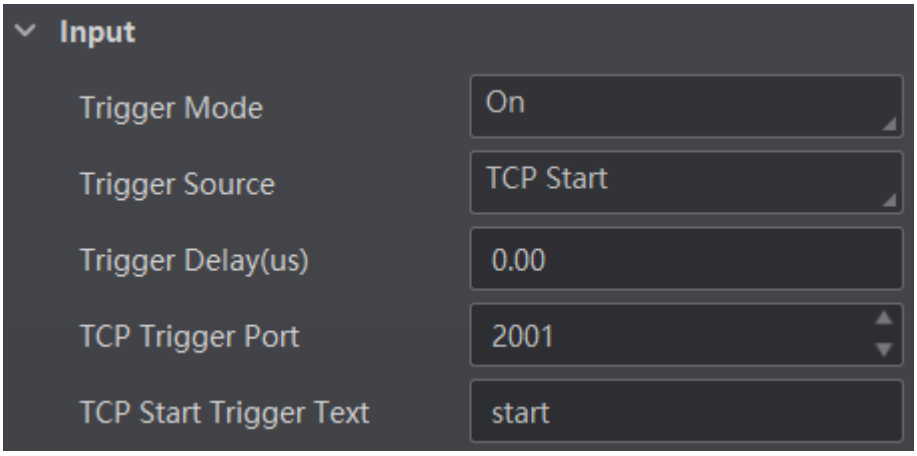

Figure 8-29 Set and Execute TCP Trigger Mode

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.

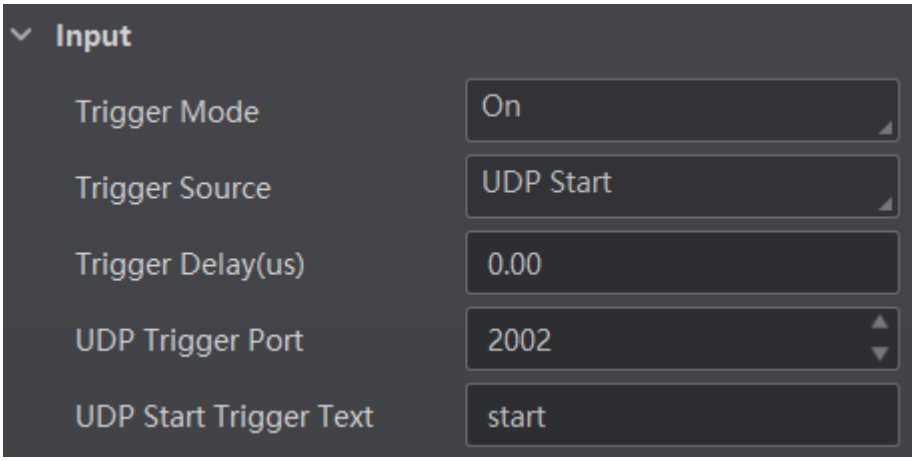

Figure 8-30 Set and Execute UDP Trigger Mode

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.

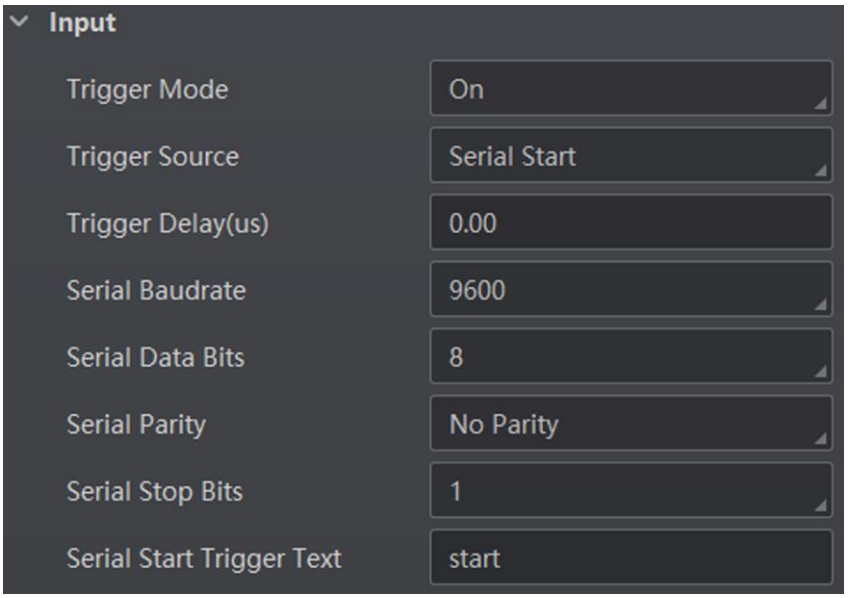

Figure 8-31 Set and Execute Serial Port Trigger Mode

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.

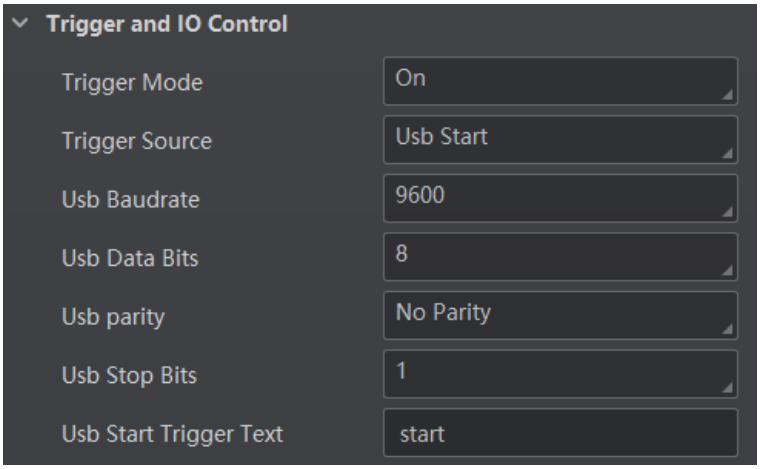

Figure 8-32 Set and Execute USB Trigger Mode

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 8-33 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.

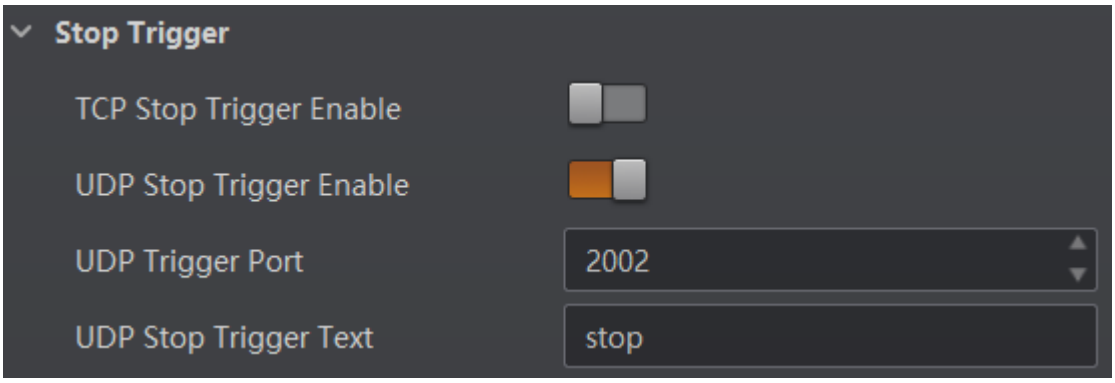

Figure 8-34 Stop Trigger via UDP

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.

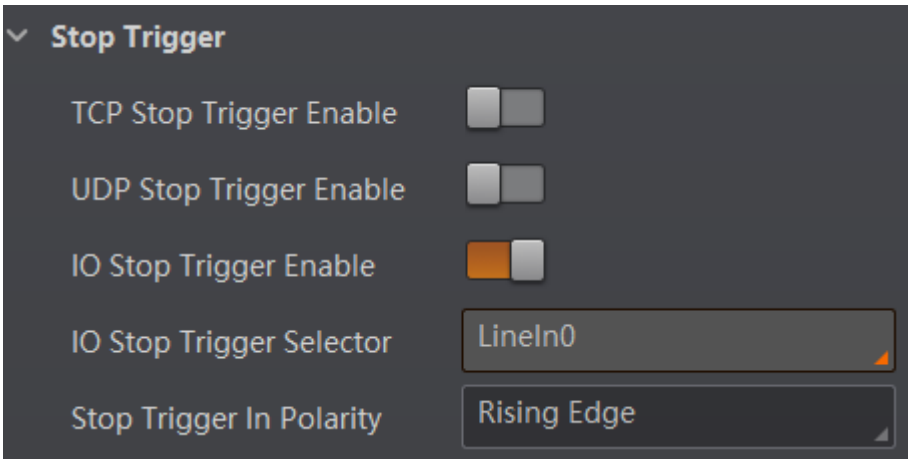

Figure 8-35 Stop Trigger via IO

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

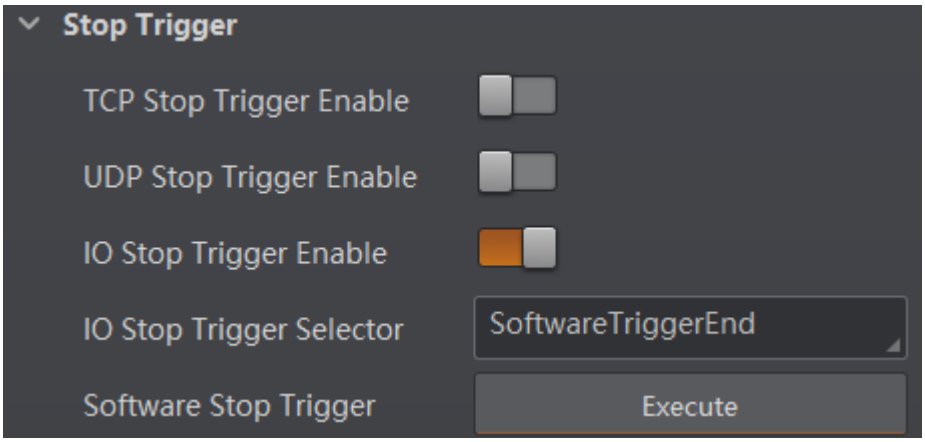

Figure 8-36 Software Trigger End

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.

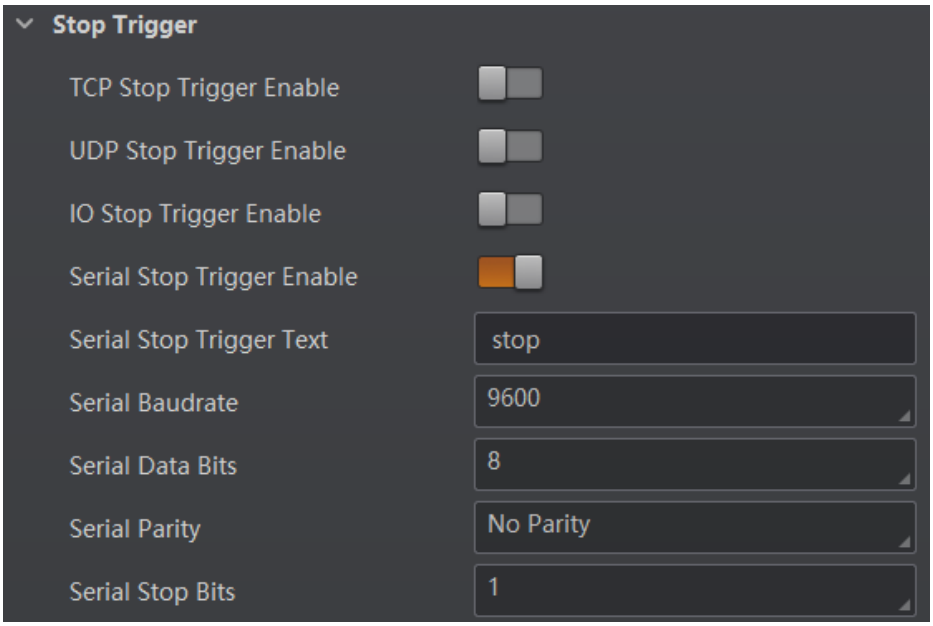

Figure 8-37 Stop Trigger via Serial Port

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.

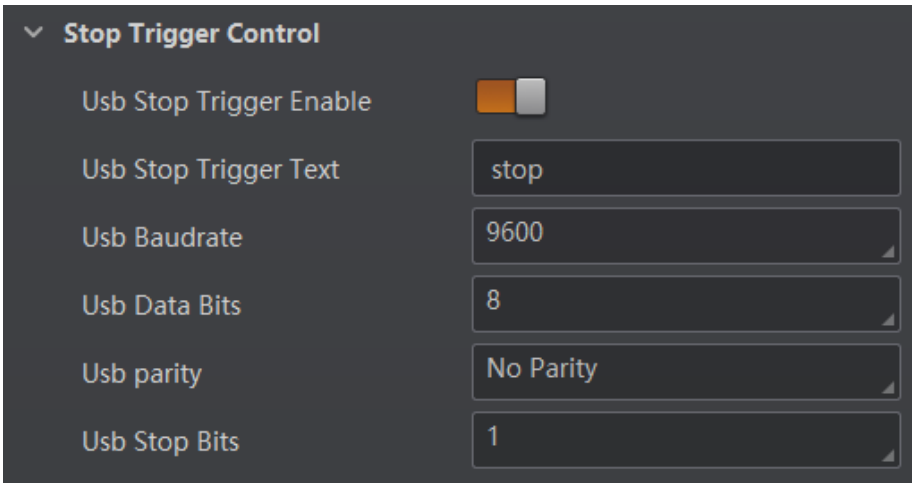

Figure 8-38 Stop Trigger via USB

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.

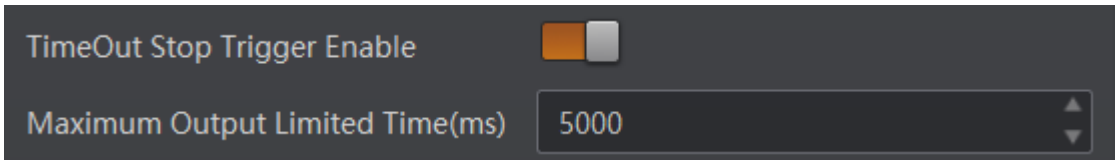

Figure 8-39 Stop Trigger via Timeout Duration

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.

Figure 8-40 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.

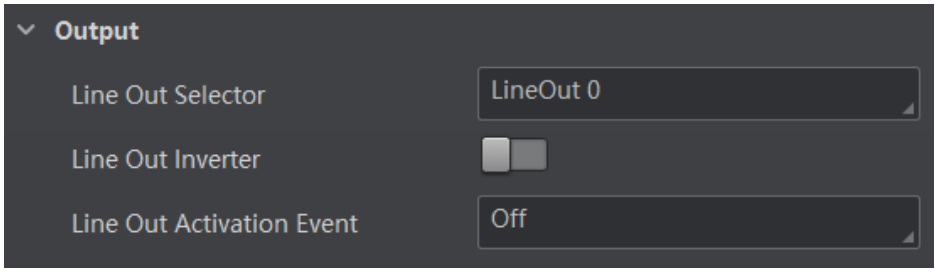

Figure 8-41 Select Output Signal

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.

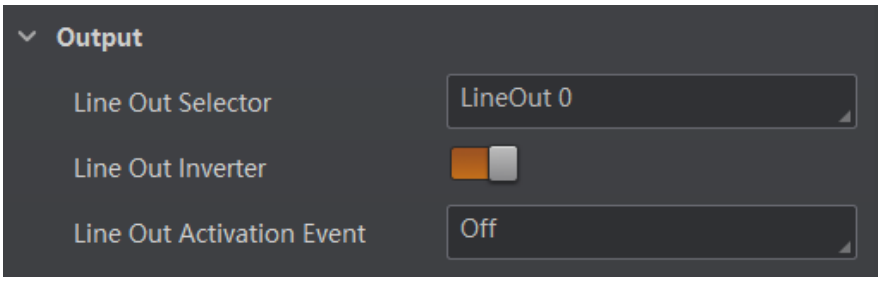

Figure 8-42 Enable Line Out Inverter

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**.

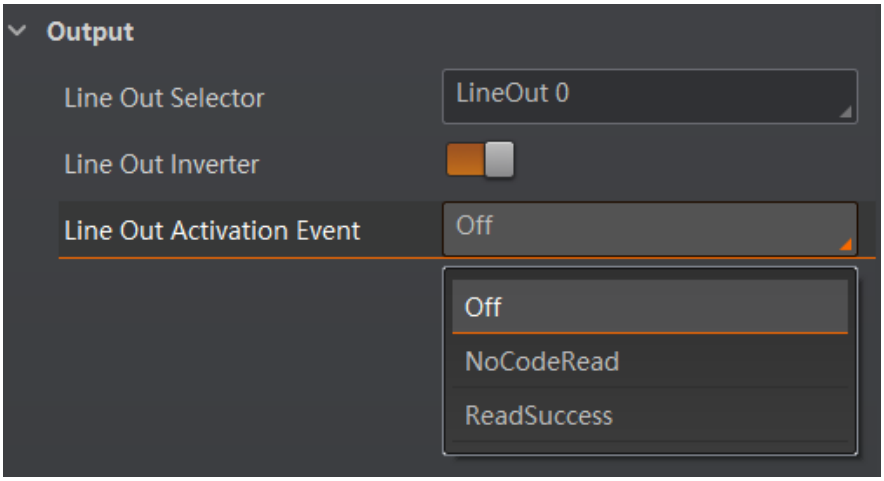

Figure 8-43 Set Event Source

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.

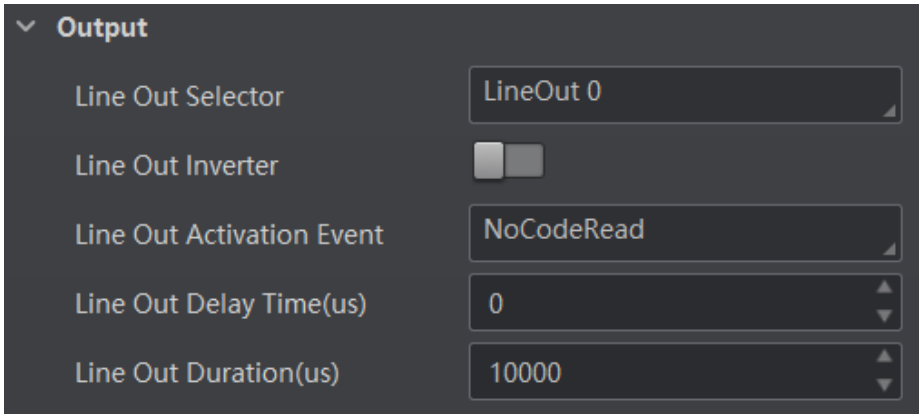

Figure 8-44 Select No Code Read

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.

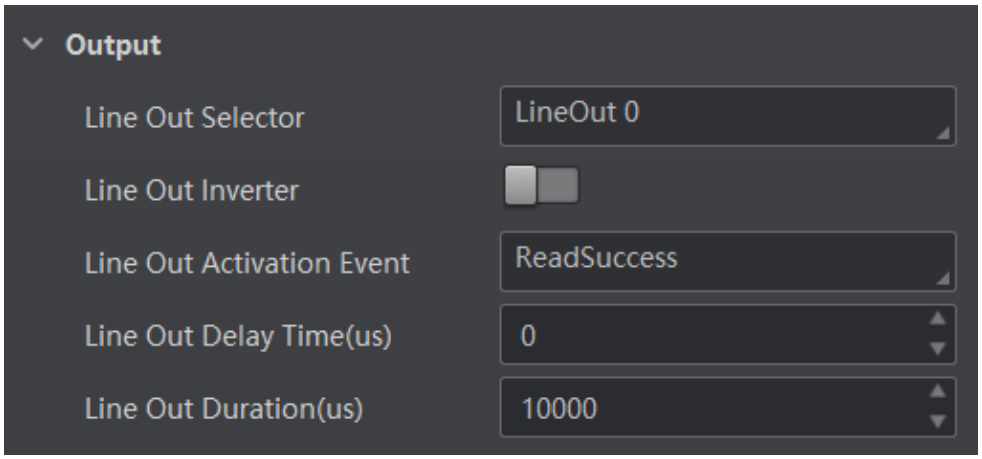

Figure 8-45 Select Read Success

8.5.4 Set Buzzer

Note

- Only type IV device supports buzzer function.
- Make sure that the device is the **Normal** mode before using the buzzer function.

The buzzer is used to indicate the device's operation status, and you can set the buzzer function according to actual demands.

Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to **Trigger and IO Control**→ **Buzzer Enable**, and enable **Buzzer Enable**.

Note

After enabling **Buzzer Enable**, the buzzer beeps three times continuously when the device is powered on, and beeps one time when the device reads codes successfully.

3. Set **Buzzer Duration (ms)** and **Buzzer Frequency (hz)** according to actual demands.

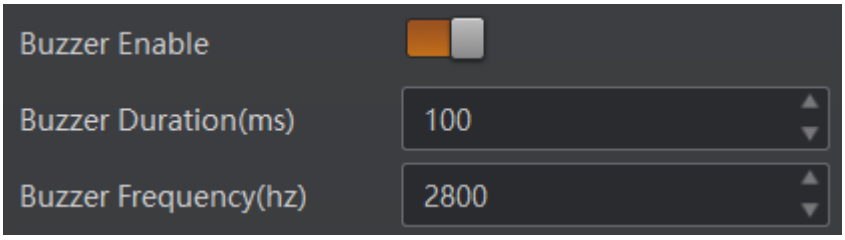

Figure 8-46 Set Buzzer

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.

Min. Output Time

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

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.

Max. Output Length

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 Rules**.

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.

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.

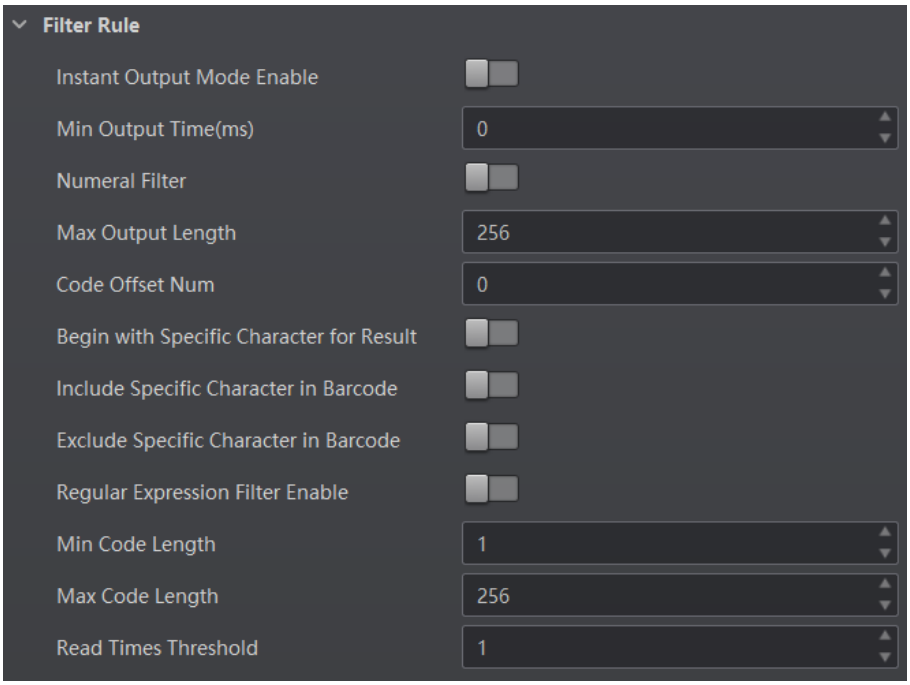

Figure 8-47 Set Filter Rule

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. Here we use normal device mode and trigger is on as an example to introduce 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.
- The supported communication protocols may differ by device models.
- Result format settings are only available if you select **TCP Client**, **Serial**, **FTP**, **TCP Server**, **Profinet**, **MELSEC/SLMP**, **Ethernet/IP**, **ModBus**, **UDP**, **Fins**, and **USB** 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.

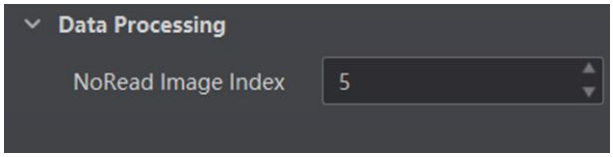

Figure 8-48 Result Output via Smart SDK or HTTP

Result Output via TCP Client, TCP Server, Serial, MELSEC, Profinet, Ethernet/IP, ModBus or Fins

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**, **Serial**, **MELSEC**, **Profinet**, **Ethernet/IP**, **ModBus** or **Fins**, 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 Output Format

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.

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.

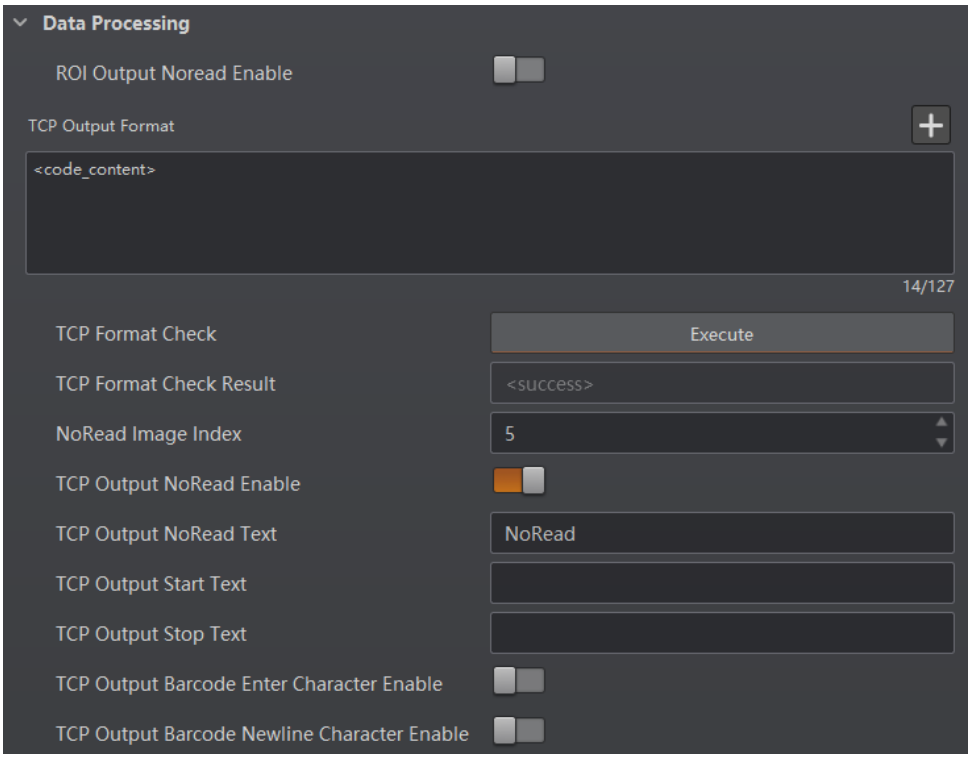

Figure 8-49 Result Output via TCP Client

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.

Note

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.

FTP File Name Contain FTP Timestamp Type

If this parameter is enabled, you can select different types of timestamp.

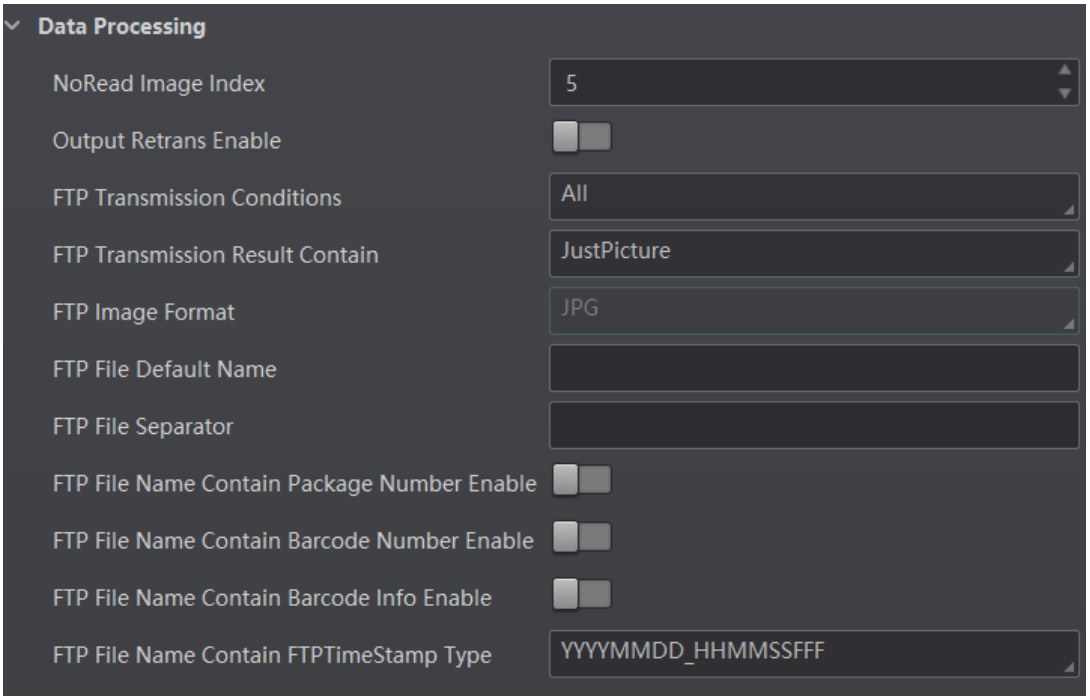

Figure 8-50 Result Output via FTP

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 Output Format

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.

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.

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.

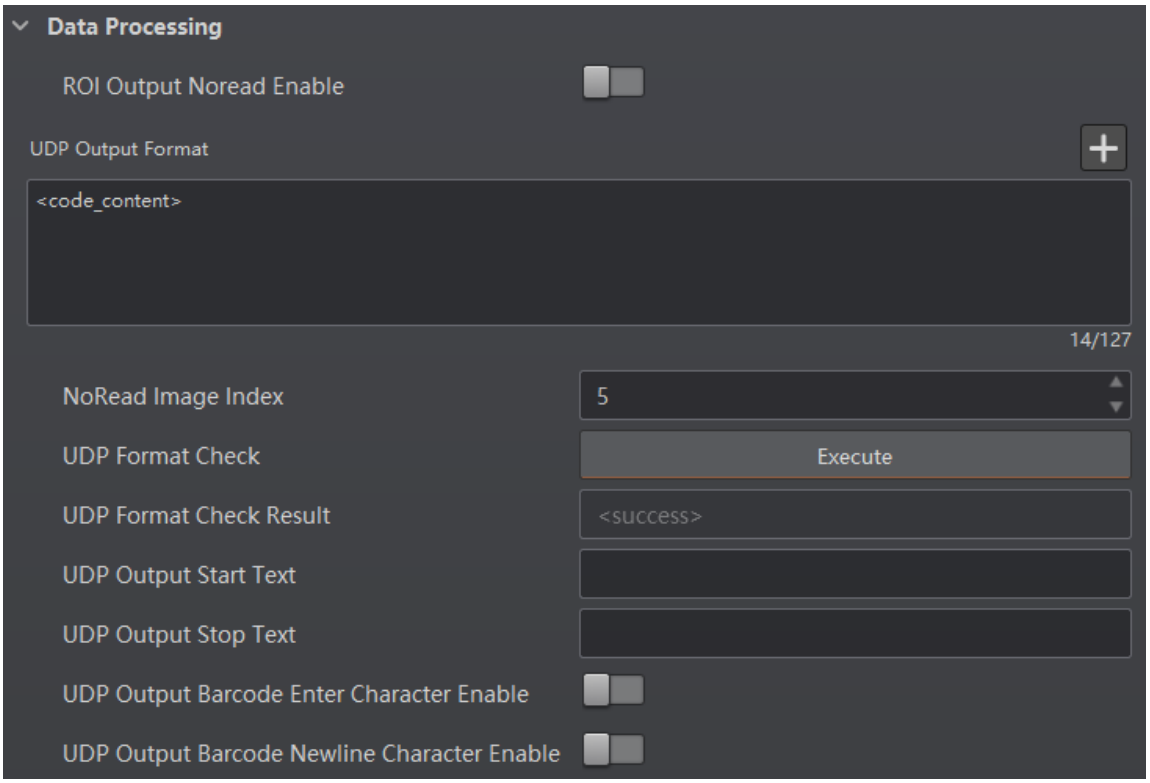

Figure 8-51 Result Output via UDP

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/SLMP**, **Ethernet/IP**, **ModBus**, **UDP**, **Fins**, and **USB** 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.
- The supported communication protocols may differ by device models.
- The specific parameters of communication protocols may differ by device models.

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

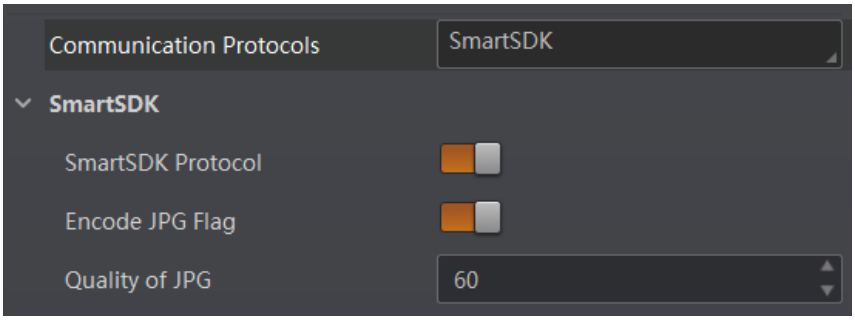

Figure 8-52 Smart SDK

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**.

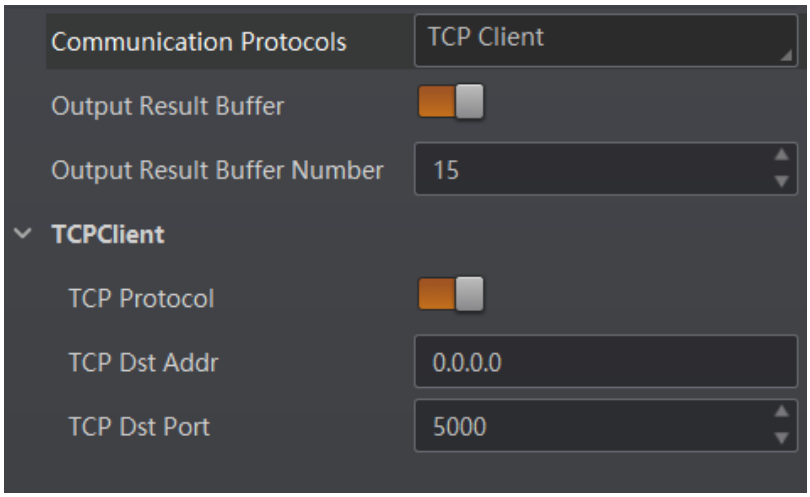

Figure 8-53 TCP Client

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**.

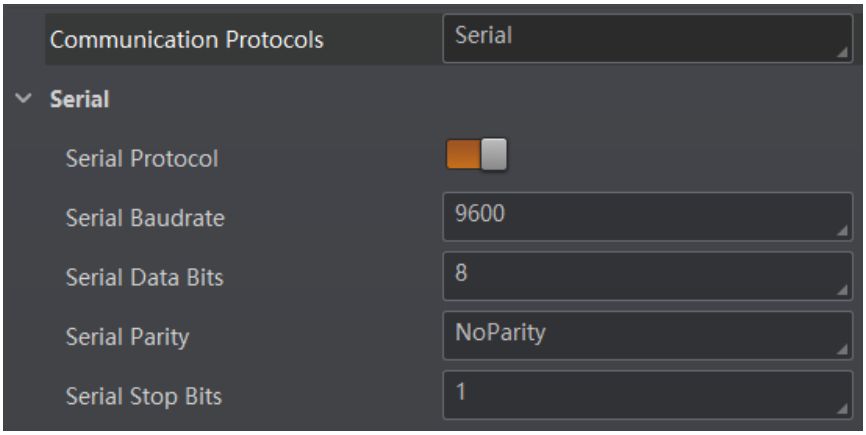

Figure 8-54 Serial

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**.

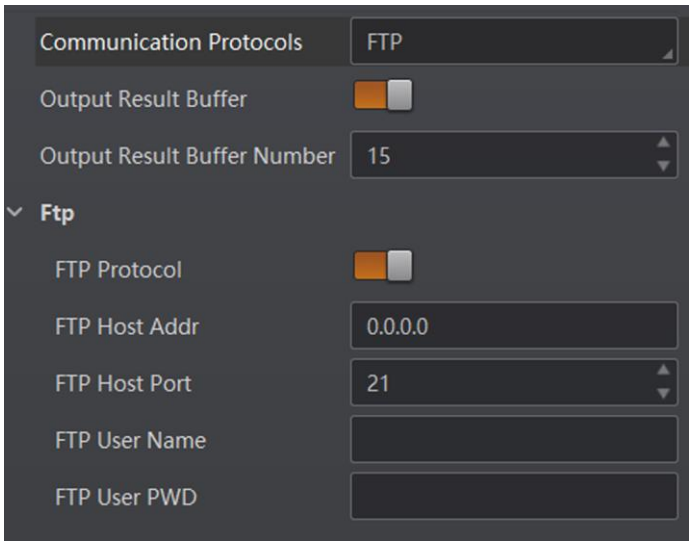

Figure 8-55 FTP

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.

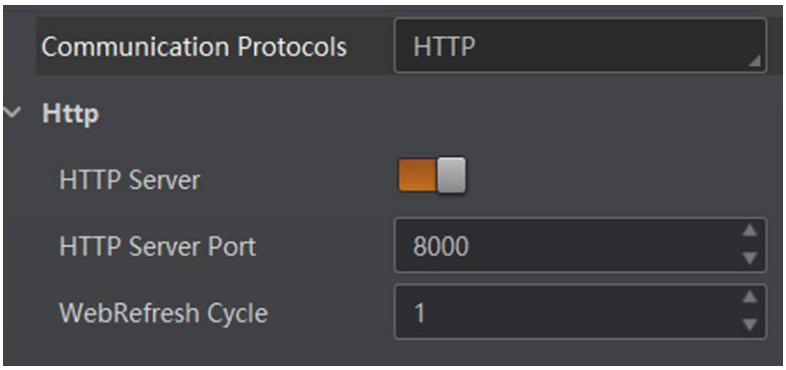

Figure 8-56 HTTP

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**.

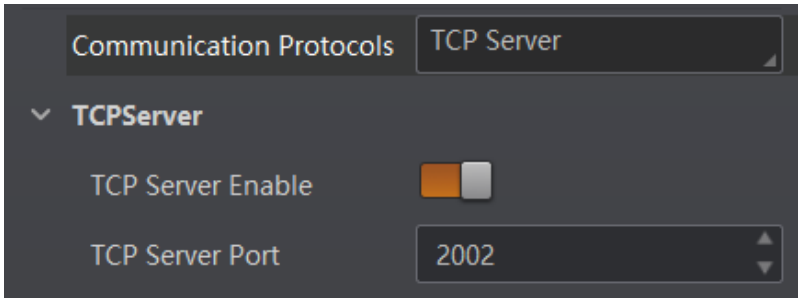

Figure 8-57 TCP Server

8.7.7 Profinet

If **Profinet** is selected as the **Communication Protocols**, you can enable **Profinet Enable** and set **Profinet Device Name**, **Profinet Result Module Size**, and **Profinet Result Timeout (s)** according to actual demands.

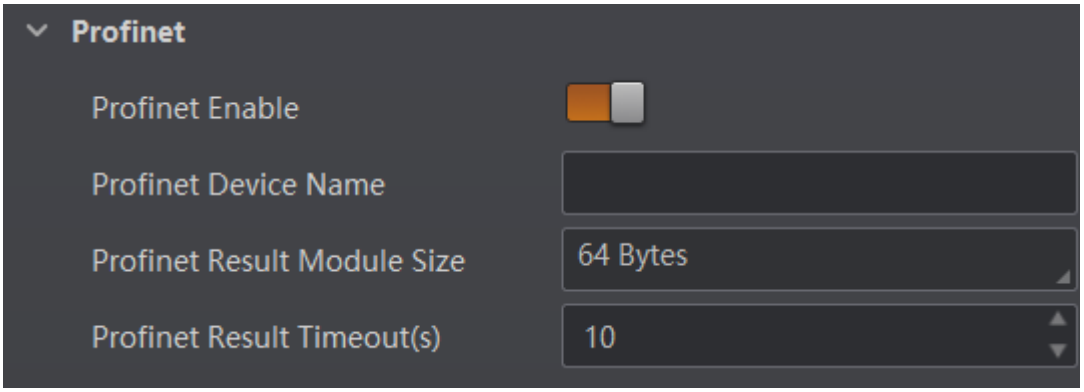

Figure 8-58 Profinet

8.7.8 MELSEC or SLMP

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

MELSEC Server IP

It sets the IP address of MELSEC server.

MELSEC Server Port

It sets the port number of MELSEC server.

MELSEC Frame Type

It sets frame type of MELSEC.

MELSEC Network Number

It sets the network number of MELSEC.

MELSEC Node Number

It sets the node number of MELSEC.

MELSEC Processor Number

It sets processor number.

MELSEC Control Poll Interval (ms)

It sets how often read data of the control area.

MELSEC Control Space

It sets storage space of the control area.

MELSEC Control Offset

It sets the start offset address of the control area.

MELSEC Control Size (Word)

It sets the size of the control area.

MELSEC Status Space

It sets storage space of the control area.

MELSEC Control Offset

It sets the start offset address of the control area.

MELSEC Control Size (Word)

It sets the size of the control area.

MELSEC Result Space

It sets storage space of the result area.

MELSEC Result Offset

It sets the start offset address of the result area.

MELSEC Result Size (World)

It sets the size of the result area.

MELSEC Result Byte Swap

If it is enabled, the client software will swap MELSEC results.

MELSEC Result Timeout

It sets the MELSEC result timeout, and the unit is s.

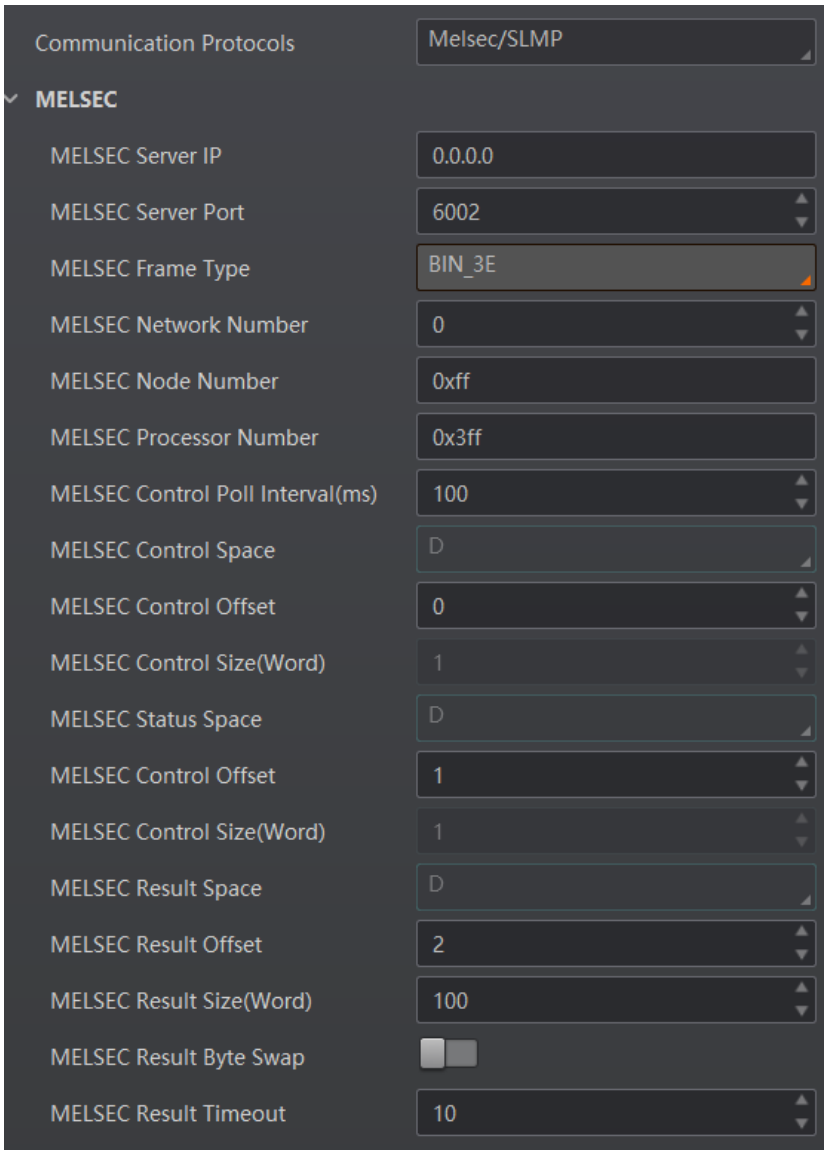

Figure 8-59 MELSEC

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. You can set **Ethernet/IP Input Assembly Size (Word)**, **Ethernet/IP Output Assembly Size (Word)**, **Ethernet/IP Result Byte Swap**, and **Ethernet/IP Result Timeout (s)** according to actual demands.

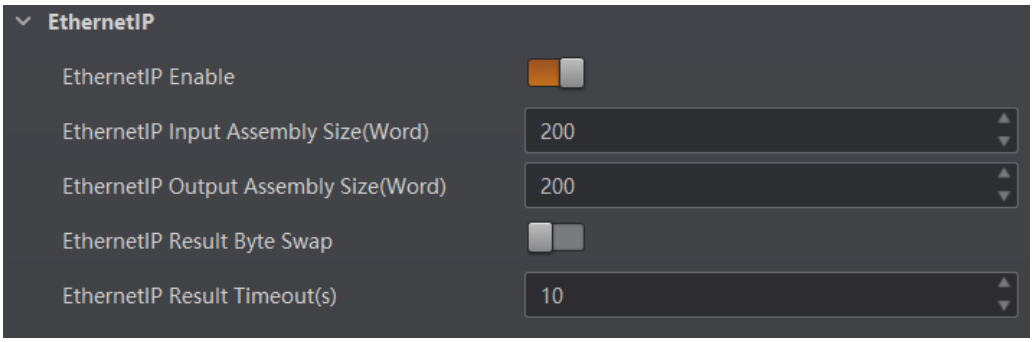

Figure 8-60 Ethernet/IP

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 Control Poll Interval (ms)**.

ModBus Control Space

It is holding_register by default.

ModBus Control Offset

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

ModBus Control Size (Word)

It is 1 by default.

ModBus Status Space

It is holding_register by default.

ModBus Status Offset

It is 1 by default.

ModBus Status Size (Word)

It is 1 by default.

ModBus Result Space

It is holding_register by default.

ModBus Result Offset

It is 2 by default.

ModBus Result Size (Word)

It sets max. length of ModBus result. It is 100 by default.

ModBus Result Byte Swap

If it is enabled, the client software will swap ModBus results.

ModBus Result Timeout (s)

It sets the ModBus result timeout, and the unit is s.

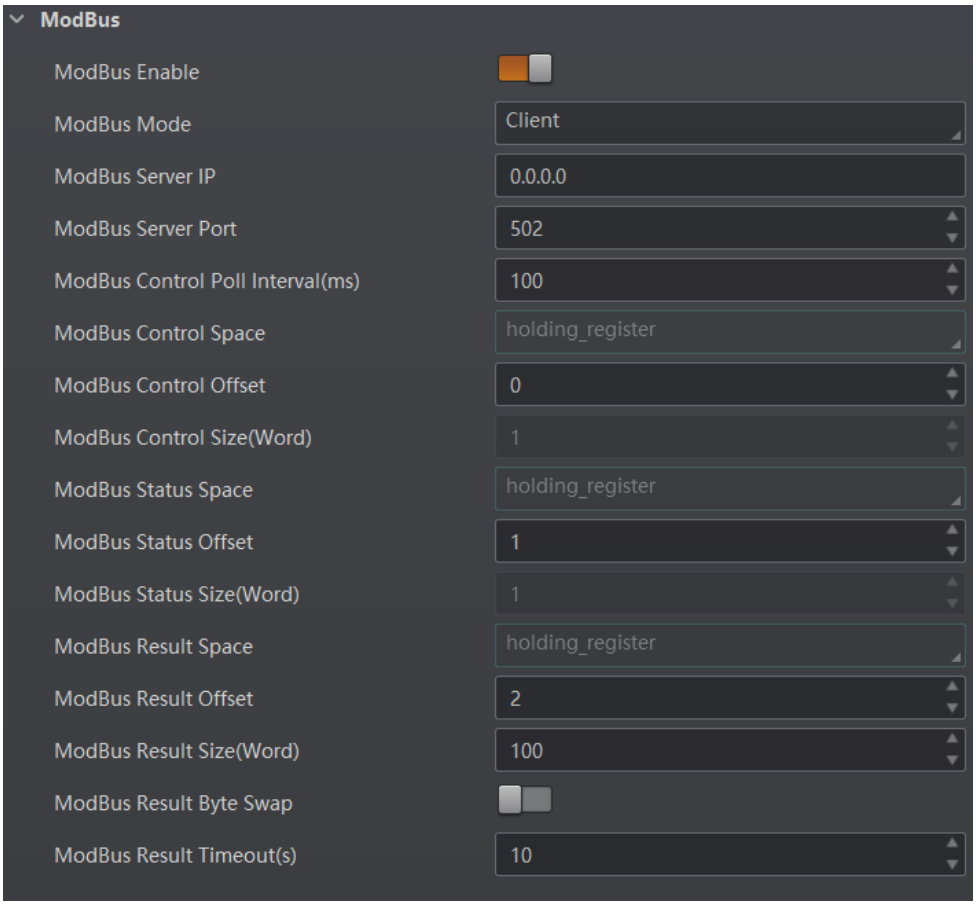

Figure 8-61 ModBus

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**.

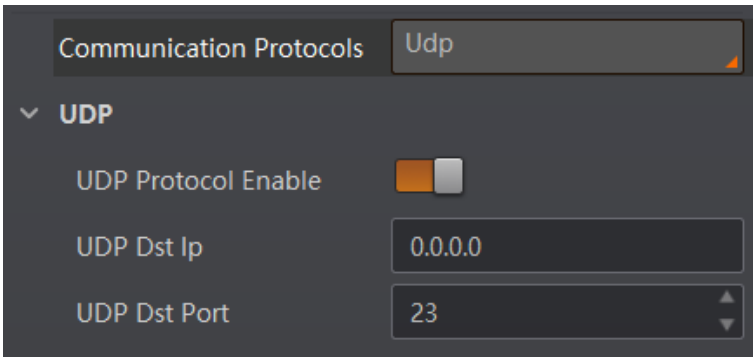

Figure 8-62 UDP

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 Server IP

It sets the server IP of Fins.

Fins Server Port

It is 9600 by default.

Fins Control Poll Interval (ms)

It sets how often read data.

Fins Control Space

It sets storage space of the control area.

Fins Control Offset

It sets the start offset address of the control area.

Fins Control Size (Word)

It sets the size of the control area.

Fins Status Space

It sets storage space of the status area.

Fins Status Offset

It sets the start offset address of the status area.

Fins Status Size (Word)

It sets the size of the status area.

Fins Result Space

It sets storage space of the result area.

Fins Result Offset

It sets the start offset address of the result area.

Fins Result Size (Word)

It sets the size of the result area.

Fins Result Byte Swap

If it is enabled, the client software will swap Fins results.

Fins Result Timeout (s)

It sets the Fins result timeout, and the unit is s.

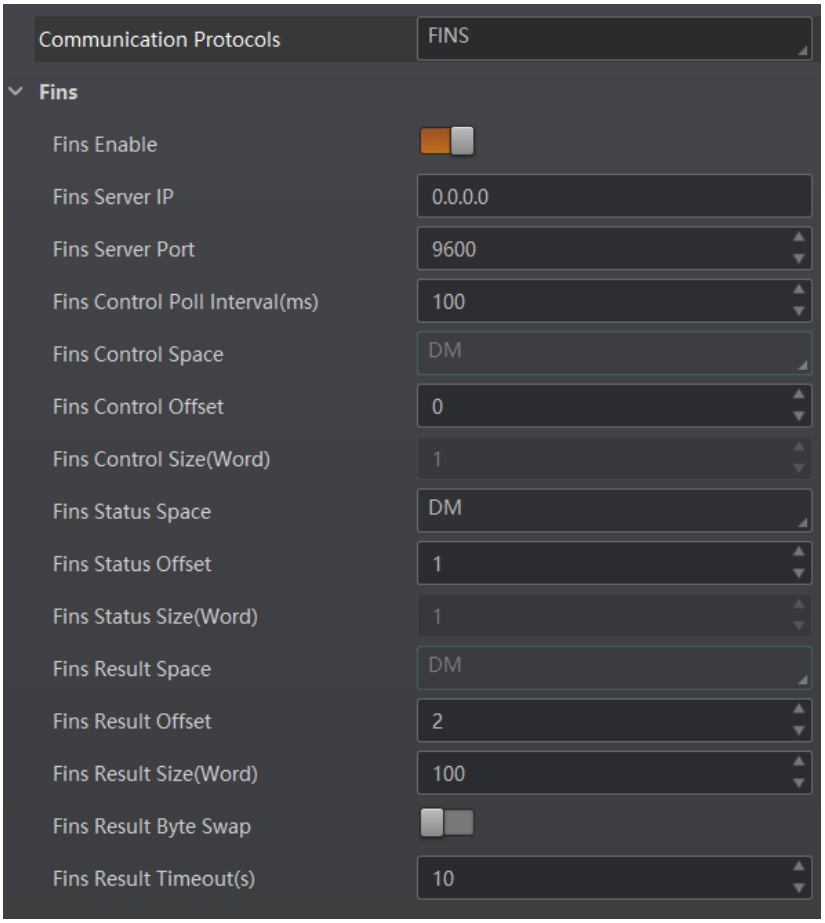

Figure 8-63 Fins

8.7.13 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**.

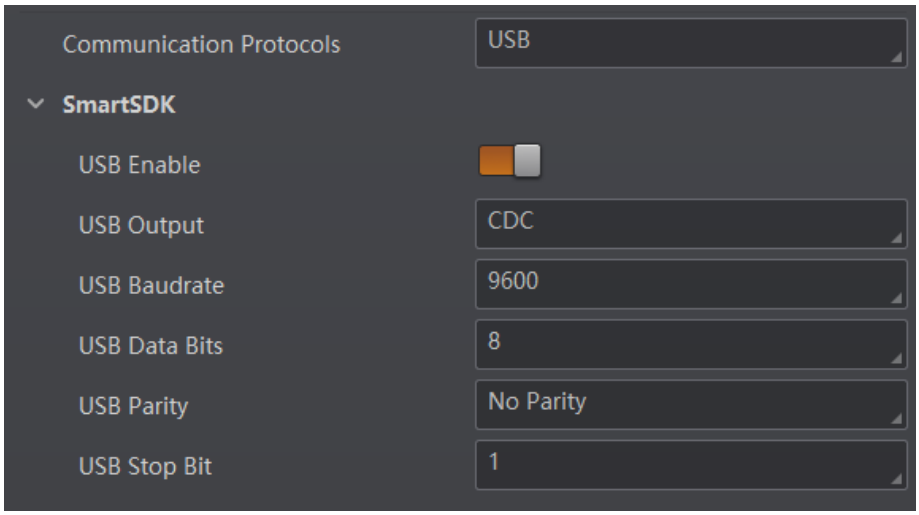

Figure 8-64 USB

Some device models support setting USB communication parameters via reading setting codes. You need to let the device read the code of starting settings to enable the function, and read the code of ending settings to disable the function.

Figure 8-65 Code of Starting Settings

Figure 8-66 Code of Ending Settings

Note

- This function may differ by device models.
- The device will restart after changing the communication mode via reading setting codes.

Table 8-1 USB Setting Codes

No.	Setting Codes	Function	No.	Setting Codes	Function
1		Enable USB HID communication mode	2		Enable USB CDC communication mode

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.

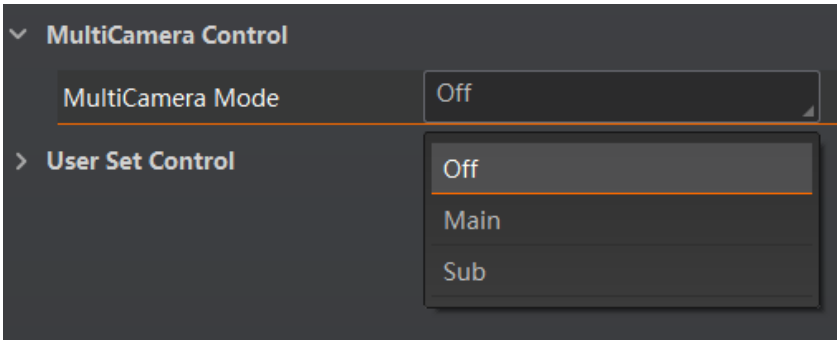

Figure 8-67 Set Multicamera Mode

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.

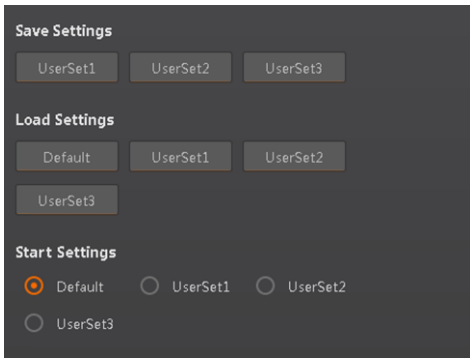

Figure 8-68 User Set Customization

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.

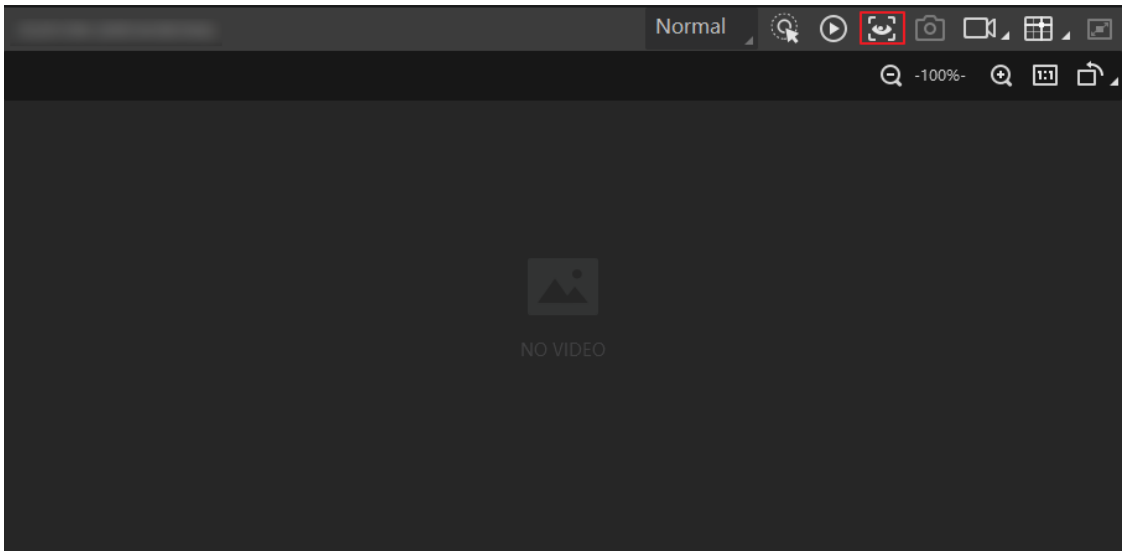

Figure 9-1 Live View

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.

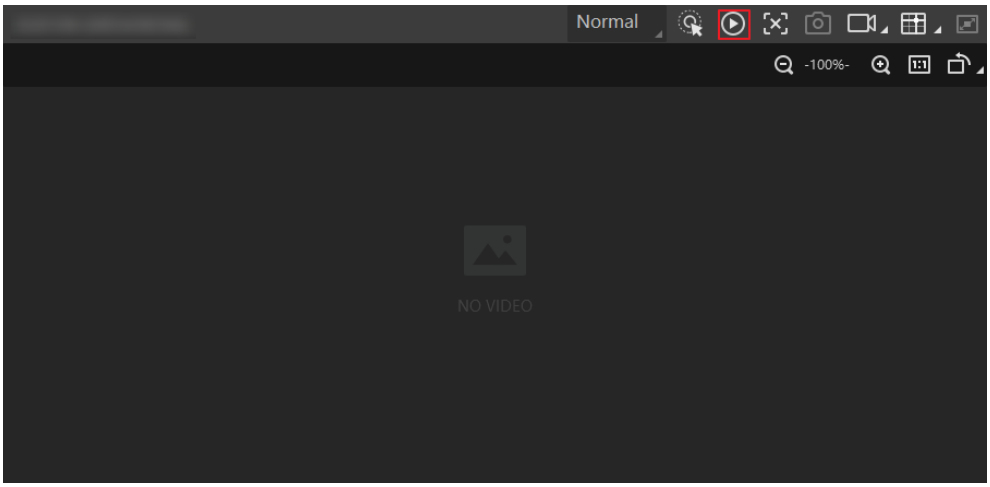

Figure 9-2 Enable Acquisition

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.

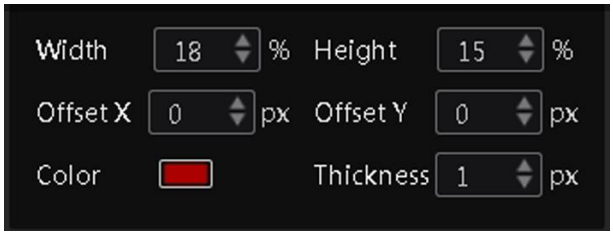

Figure 9-3 Add Cross Line

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.

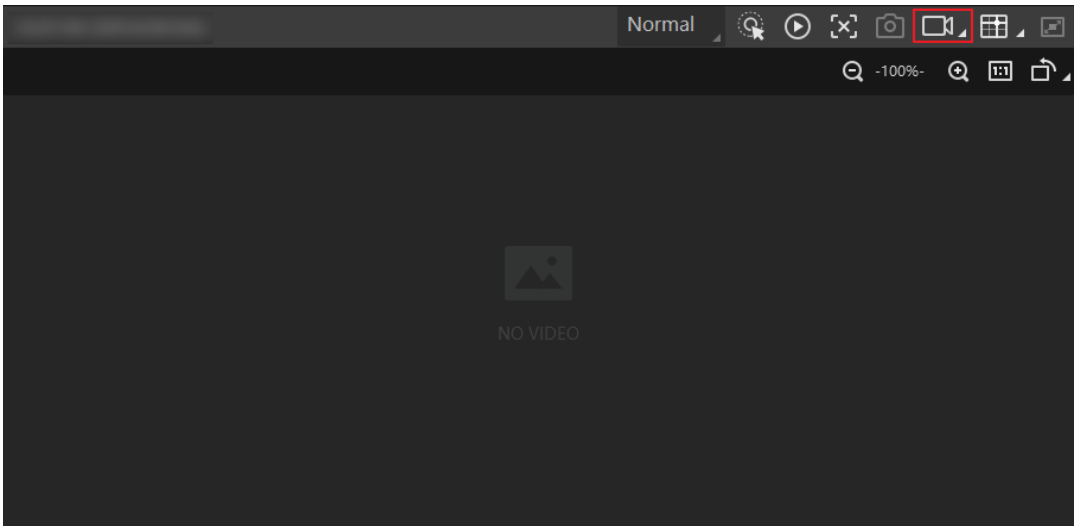

Figure 9-4 Start Recording

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.

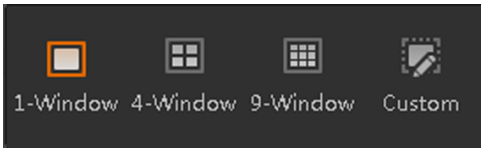

Figure 9-5 Split Window

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.

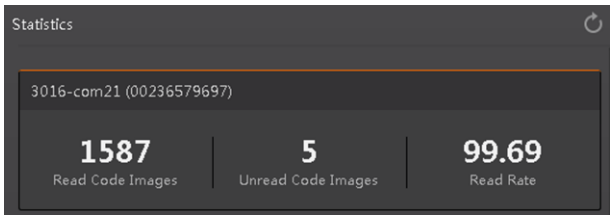

Figure 9-6 View Reports

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.

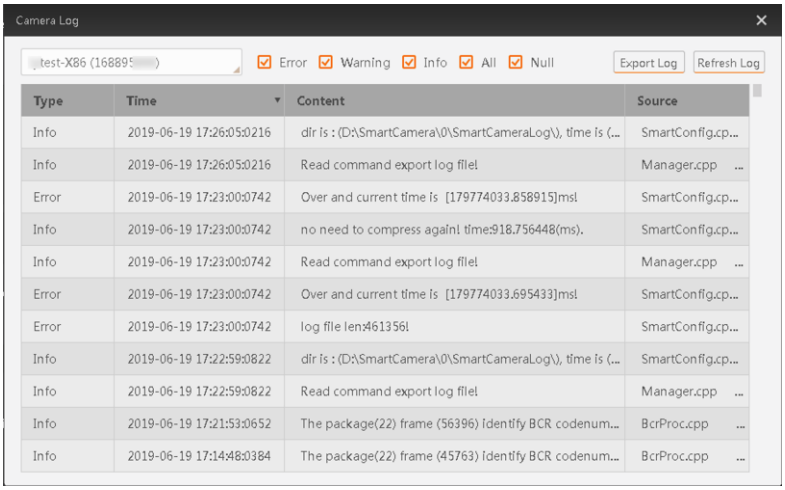

Figure 9-7 View Log

9.8 Set Time

After enabling NTP time synchronization, the device will synchronize time according to the configured interval.

Steps

1. Go to **Config Management**, and find **Timing**.
2. Click **Setting** and enable **NTP Enable**.
3. Set parameters according to actual demands.

Note

Configure NTP server settings before using NTP time synchronization function.

4. Click **OK** after settings.

Figure 9-8 Set NTP Timing

9.9 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**.

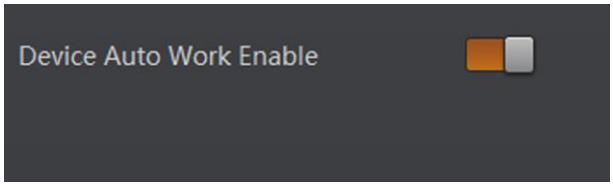

Figure 9-9 Enable Device Auto Work

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.

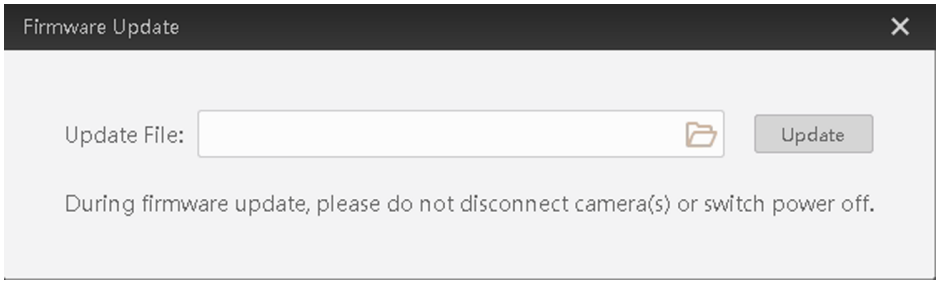

Figure 10-1 Update Firmware

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**.

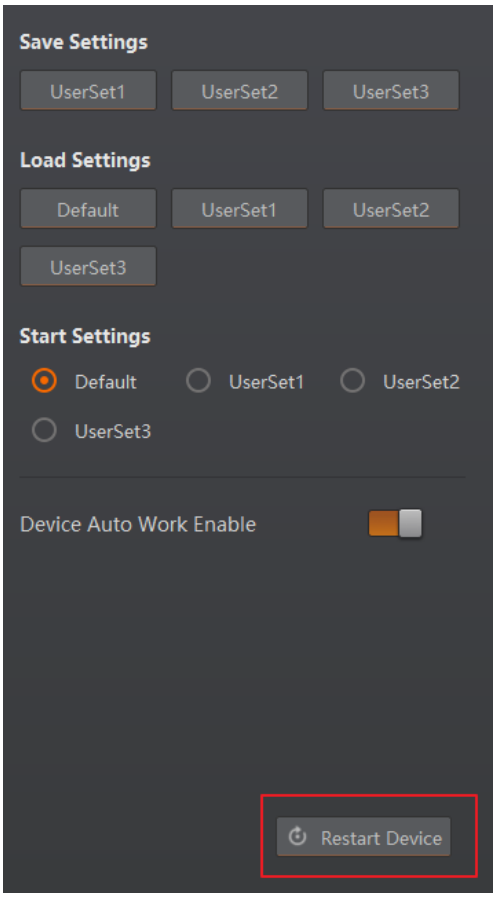

Figure 10-2 Reboot Device

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