Hikrobot Co., Ltd.

ID2000 Series Industrial Code Reader

User Manual

HIKROBOT

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

Symbol	Description
Danger	Indicates a hazard with a high level of risk, which if not avoided, will 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 Industrial Code Reader.

Contact Information

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Contents

Chapter 1 Safety Instruction

The safety instructions are intended to ensure that the user can use the device correctly to avoid danger or property loss. Read and follow these safety instructions before installing, operating and maintaining the device.

1.1 Safety Claim

- To ensure personal and device safety, when installing, operating, and maintaining the device, follow the signs on the device and all safety instructions described in the manual.
- The note, caution and danger items in the manual do not represent all the safety instructions that should be observed, but only serve as a supplement to all the safety instructions.
- The device should be used in an environment that meets the design specifications, otherwise it may cause malfunctions, and malfunctions or component damage caused by non-compliance with relevant regulations are not within the scope of the device's quality assurance.
- Our company will not bear any legal responsibility for personal safety accidents and property losses caused by abnormal operation of the device.

1.2 Safety Instruction

⚠Caution

- Do not install the device if it is found that the device and accessories are damaged, rusted, water ingress, model mismatch, missing parts, etc., when unpacking.
- Avoid storage and transportation in places such as water splashing and rain, direct sunlight, strong electric fields, strong magnetic fields, and strong vibrations.
- Avoid dropping, smashing or vigorously vibrating the device and its components.
- It is forbidden to install the indoor device in an environment where it may be exposed to water or other liquids. If the device is damp, it may cause fire and electric shock hazard.
- Place the device in a place out of direct sunlight and ventilation, away from heat sources such as heaters and radiators.
- In the use of the device, you must be in strict compliance with the electrical safety regulations of the nation and region.
- Use the power adapter provided by the official manufacturer. The power adapter must meet the Limited Power Source (LPS) requirements. For specific requirements, please refer to the device's technical specifications.
- It is strictly forbidden to wire, maintain, and disassemble the device is powered on. Otherwise, there is a danger of electric shock.
- Make sure that the device is installed in good condition, the wiring is firm, and the power

supply meets the requirements before powering on the device.
- For a device with a power switch, please use the switch to power on and off. It is strictly forbidden to plug and unplug the power cord.
- Looking directly at the device may cause harm to the eyes. Protective measures like wearing protective glasses should be taken in the process of installation, maintenance and debugging.
- If the device emits smoke, odor or noise, please turn off the power and unplug the power cord immediately, and contact the dealer or service center in time.
- It is strictly forbidden to touch any terminal of the device when operating it. Otherwise there is a danger of electric shock.
- It is strictly forbidden for non-professional technicians to detect signals during device operation, otherwise it may cause personal injury or device damage.
- It is strictly forbidden to maintain the device that is powered on, otherwise there is a danger of electric shock.
- Avoid aiming the image sensor at strong light in direct mode or reflection mode, such as laser beams, otherwise the image sensor will be damaged.
- Keep clean of the device's image acquisition window. It is recommended to use cleaning water (not the alcohol-based corrosive solutions) to wipe off the dust. When the device is not in use, please add a dust cover to protect the image acquisition window.
- If the device does not work properly, please contact your dealer or the nearest service center. Never attempt to disassemble the device yourself. We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.
- Please dispose of the device in strict accordance with the relevant national or regional regulations and standards to avoid environmental pollution and property damage.

Note

- Check whether the device's package is in good condition, whether there is damage, intrusion, moisture, deformation, etc. before unpacking.
- Check the surface of the device and accessories for damage, rust, bumps, etc. when unpacking.
- Check whether the quantity and information of the device and accessories are complete after unpacking.
- Store and transport the device according to the storage and transport conditions of the device, and the storage temperature and humidity should meet the requirements.
- It is strictly prohibited to transport the device in combination with items that may affect or damage the device.
- Please read the manual and safety instructions carefully before installing the device.
- 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.
- Do not contact the device with strong acids, alkalis, oils, greases or organic solutions

such as thinners.
- Do not expose the device directly to flashlights, high-frequency switch lighting devices, or to sunlight, which may affect the performance.
- Do not impose pressure on the cable end of the device, such as forced bending, pulling, etc.

1.3 Electromagnetic Interference Prevention

- Make sure that the shielding layer of cables is intact and 360° connected to the metal connector when using shielded cables.
- Do not route the device together with other equipment (especially servo motors, high-power devices, etc.), and control the distance between cables to more than 10 cm. Make sure to shield the cables if unavoidable.
- The control cable of the device and the power cable of the industrial light source must be wired separately to avoid bundled wiring.
- The power cable, data cable, signal cable, etc. of the device must be wired separately. Make sure to ground them if the wiring groove is used to separate the wiring and the wiring groove is metal.
- During the wiring process, evaluate the wiring space reasonably, and do not pull the cables hard, so as not to damage the electrical performance of the cables.
- If the device is powered on and off frequently, it is necessary to strengthen the voltage isolation, and consider adding a DC/DC isolation power supply module between the device and the adapter.
- Use the power adapter to supply power to the device separately. If centralized power supply is necessary, make sure to use a DC filter to filter the power supply of the device separately before use.
- The unused cables of the device must be insulated.
- When installing the device, if you cannot ensure that the device itself and all equipment connected to the device are well grounded, you should isolate the device with an insulating bracket.
- To avoid the accumulation of static electricity, ensure that other equipment (such as machines, internal components, etc.) and metal brackets on site are properly grounded.
- During the installation and use of the device, high voltage leakage must be avoided.
- Use a figure-eight bundle method if the device cable is too long.
- When connecting the device and metal accessories, they must be connected firmly to maintain good conductivity.
- Use a shielded network cable to connect to the device. If you use a self-made network cable, make sure that the shielding shell at the aviation head is well connected to the aluminum foil or metal braid of the shielding cable.

1.4 Laser Precaution

The laser safety class of some devices belongs to laser 2.

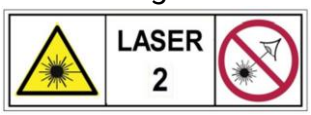


Figure 1-1 Class 2 Laser Product

Caution

- Do not use optical instruments (such as telescopes, magnifier) to observe the laser beam.
- Do not look directly at the laser module window to avoid irreversible damage to your eyes.

Chapter 2 Overview

2.1 Introduction

With functions of image acquisition, code recognition and output, the ID2000 series industrial code reader can read different types of 1D codes and 2D codes. It adopts compact design and is small in size. The device is applicable to consumer electronics, food and medicine, semiconductor, new energy, and other industries.
The device uses sensors and optical elements to obtain images of the measured object, and achieves code parsing via the built-in deep learning code reading algorithm. It also supports outputting the detection results through different communication modes.

2.2 Key Feature

- Compact design and small in size.
- Adopts LED aiming light to help aim codes.
- Adopts buzzer and status indicator for prompting the device’s operation status.
- Built-in deep learning algorithm to read codes with good robustness.
- Adopts multiple IO interfaces and plug-in power interface.
- Supports multiple communication protocols, including TCP Server, Serial, FTP, TCP Client, UDP, USB, etc.
- Supports code quality evaluation, and quality standards include ISO15415, ISO15416, and ISO29158.

Note

- The specific functions may differ by device models.
- Refer to the device's specifications for specific parameters.

Chapter 3 Appearance

Note

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

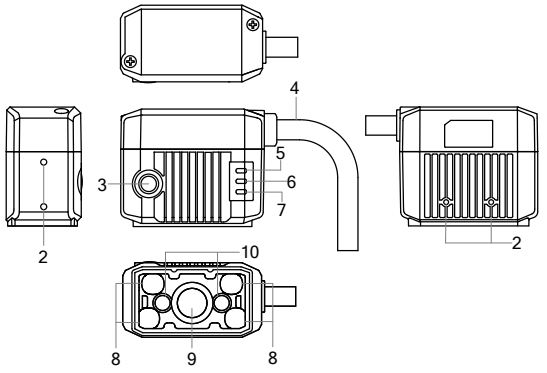
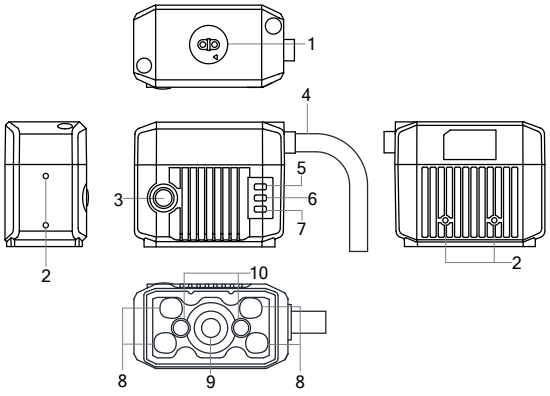
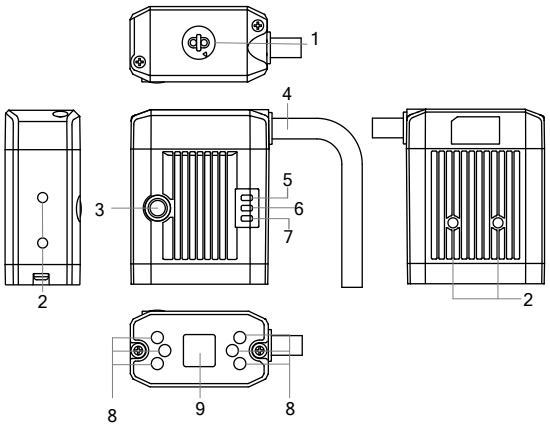
Refer to the tables and figures below for the device type and device appearance.

Table 3-1 Device Type

Variant Components	Device Type
Connector on SR Cable	There are two connectors on the SR cable of the device: 17-pin M12 connector and DB15 connector. The device with DB15 connector refers to appearance of type V, and the devices with 17-pin M12 connector refer to appearances of type I to type IV.
Lens and Focusing Mode	Based on the differences of lens and focusing mode, the devices can be classified to five types: ● C-mount device: The lens mount of the device is C-mount. The lens should be purchased separately. ● Fixed-focus device: The device has built-in M5.8-mount lens, and its focal length cannot be adjusted. Make sure the measured object is within the field of view during using. **Note** Refer to the device's specification for information of field of view. ● Auto-focusing device: The device has built-in M12-mount lens, and its focal length can be adjusted via related parameters. **Note** Refer to section ***Set Smart Tune*** for details. ● Manual-focusing device with short focal length: The device has built-in M10-mount lens, and its focal length can be adjusted manually via focus knob on the top side of the device. ● Manual-focusing device with long focal length: The device has built-in M12-mount lens, and its focal length can be adjusted manually via focus knob on the top side of the device.
Data Interface	Based on the data interface and data transmission protocol, the devices can be classified to two types: device

Variant Components	Device Type
	with network interface and device with USB interface. There are differences in the interface definition and the cables provided in the package. **Note** Refer to section ***Connector and Cable*** for details.

Table 3-2 Device Appearance

Device Type		Appearance	
Type I	ID2000M Series Auto-Focusing Device (Network Interface & USB Interface)		
Type II	ID2000M Series Manual-Focusing Device with Short Focal Length (Network Interface & USB Interface)		
Type III	ID2000M Series Manual-Focusing Device with Long Focal Length (Network Interface & USB Interface)		

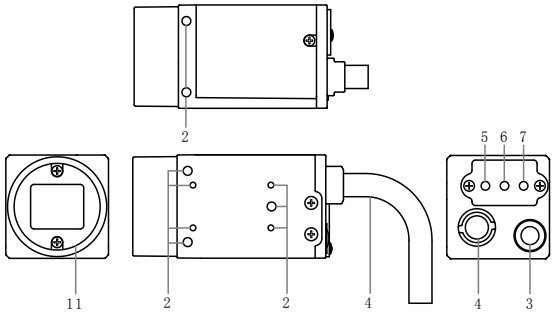
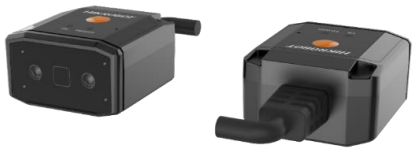
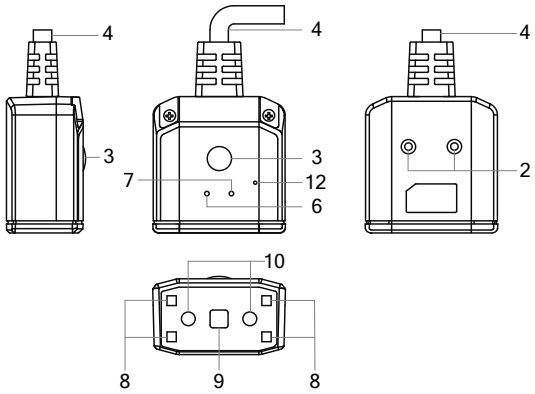
Device Type		Appearance	
Type IV	ID2000M Series C-Mount Device (Network Interface & USB Interface)		
Type V	ID2000EM Series Fixed-Focus Device (Network Interface & USB Interface)		 **Note** The position of the SR cable may differ by device models.

Table 3-3 Component Description

No.	Name	Description
1	Focus Knob	It is used to adjust focal length manually. **Note** Only ID2000M series manual-focusing devices with Short/Long Focal Length have this component.
2	Screw Hole	It is used to fix the device to the installation position, and is applicable to M2 or M3 screws. **Note** Refer to the device's specification for information of screw hole in dimension.
3	Button	It is used to trigger the device or execute smart tune process. ● Trigger button: When the device is in trigger mode and software trigger is selected, press the button and the device triggers once. All devices with the button support this function. ● Smart tune button: Hold the button for 3 seconds and the

No.	Name	Description
		device starts smart tune. Hold the button for 3 seconds again during smart tune process, and the adjustment will be cancelled. All devices with the button support this function.
4	SR Cable	The connector on the SR cable provides power, I/O, Ethernet/USB, and serial port. It should be used with the supplied cable. **Note** ● The connector on the SR cable may differ by device models. Refer to section ***Connector and Cable*** for details. ● The position of the SR cable may differ by models of ID2000EM series fixed-focus device.
5	LINK Indicator	It is a network status indicator. The indicator is flashing green when the network transmission is normal. Otherwise, it is unlit. **Note** The devices with USB interface transfer data via virtual network interface in the client software. Therefore, the data transmission status of these devices can also be checked via this indicator.
6	Status Indicator	● It is in red color when the device starts up or operation error occurs. ● It is unlit when the device operates normally without reading codes. ● It is in green color lasting 0.5 seconds when the device reads codes successfully. ● It is solid green when the device reads codes continuously. ● It is in red color lasting 0.5 seconds when the device does not read codes. **Note** The specific function of the status indicator may differ by device models.
7	PWR Indicator	It is a power indicator. The indicator is in red color during the device's power-on process. After the device is powered on, the indicator is in green color.
8	Light Source	It is the LED light source used to provide light when the device acquires images. **Note** The light source color may differ by device models.
9	Image Sensor	It is used to acquire images.
10	Aiming Light	It helps to indicate the field of view and aim targets.

No.	Name	Description
11	Lens Mount	It is used to install the lens. Only C-mount device has the lens mount.
12	Buzzer	The buzzer beeps three times when the device is powered on, beeps twice when the device reads configuration codes successfully, and beeps once when the device reads codes successfully. **Note** ● Only ID2000EM series fixed-focus devices have a buzzer. ● Refer to section ***Set Buzzer*** for details.

Chapter 4 Installation

4.1 Installation Preparation

You need to prepare following accessories before installation.

Table 4-1 Accessories

No.	Name	Image	Quantity	Description
1	Power Adapter or Switch Power Supply		1	You should select a suitable power adapter or switch power supply according to the device power supply and consumption. You need to purchase separately.
2	Cable		1	It refers to the supplied cable that is used to connect the device to the external devices or accessories. **Note** ● For ID2000M series devices with network interface, it refers to the 3 m cable with 17-pin M12 to 8-pin terminal, RJ45, and DB9 serial port. ● For ID2000EM series devices with network interface, it refers to the 3.5 m cable with DB15 to 6-pin terminal, RJ45, and DB9 serial port. ● For ID2000M series devices with USB interface, it refers to the 2 m cable with 17-pin M12 to USB connector. If I/O function is needed, you can purchase the cable with 17-pin M12 to 8-pin terminal, USB connector, and DB9 serial port of our company. ● For ID2000EM series devices with USB interface, it refers to the 2 m cable with DB15 to USB connector. If I/O function is needed, you can purchase the cable with DB15 to 6-pin terminal, USB connector, RJ45, and DB9 serial port of our company.

No.	Name	Image	Quantity	Description
3	IO Box		1	It refers to the IO box that is used for connecting the device's power supply and I/O interfaces to the external device. **Note** The IO box may not be included in the package due to different device models.
4	Insulating Bracket		1	It is used for electrostatic shielding between the device and other field-used devices, preventing the cables or devices from being burned out. You need to purchase separately.

Note

- The type of the IO box may differ by the device model. Please refer to the actual one.

Table 4-2 IO Box

IO Box	Applicable Device	Usage	Description
6-Pin IO Box	ID2000EM Series Device	The IO box can be used for switching pull-up and pull-down resistors for each I/O channel.	You should purchase it separately.
8-Pin IO Box V1.0	ID2000M Series Device	The IO box can be used for switching pull-up and pull-down resistors for each I/O channel.	One of the IO boxes is included in the package. Please refer to the actual one.
8-Pin IO Box V2.0		The IO box can be used for upgrading the non opto-isolated I/O to opto-isolated I/O.	

- You can scan the QR codes below to get the operating guide of the IO box.

Table 4-3 Operating Guide of IO Box

IO Box	Operating Guide
6-Pin IO Box	
8-Pin IO Box V1.0	
8-Pin IO Box V2.0	

4.2 Device Wiring

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.
- When connecting the device to the cable, confirm whether it is a motion cable and pay attention to the following points during use.
  - The installation of the cable should avoid excessive bending and tension, especially at the connector. The motion cable should be secured in a manner that prevents mechanical stress or sharp bends at the connection.
  - The non-motion cable should not be used in scenarios that may cause damage, such as bending, dragging, or twisting.
  - The use of motion cable should comply with the cable specifications, including but

not limited to bending radius, movement speed, and service life.

⚠Caution

- When the power adapter or the industrial switching power supply is used for power supply, make sure that the device is powered independently and does not share the power source with other devices.
- When the industrial switching power supply is used for power supply, pay attention to the following matters:
  - Before any installation or maintenance work, please disconnect the power supply from the utility, and ensure that it will not be reconnected inadvertently.
  - Do not install the power supply in places with high moisture or near the water.
  - Do not install the power supply in places with high ambient temperature or near fire source.
  - Please install the exposed high-voltage terminals on the power supply in a closed chassis or cabinet to prevent accidental contact.
  - Keep enough insulation distance between mounting screws and internal components of power supply.
  - Fans and ventilation holes must be kept free from any obstructions. Also a 10 cm to 15 cm clearance should be kept when the adjacent device is a heat source.
  - The power supply must be grounded as required.
  - Output current and output power must not exceed the rated values on specifications.
  - Non-standard mounting or operating under high ambient temperature may increase the internal component temperature and will decrease the output power.
  - All failure should be examined by a qualified technician. Do not remove the case of the power supply by yourself.
  - Do not touch the power terminal for 5 minutes after the power is turned off, that may cause electric shock.
- When the ID2000M series devices with USB interface use the USB interface for power supply, it is recommended to use USB 3.0 interface on the PC. The USB 2.0 interface for power supply may cause startup failure.
- When the ID2000EM series devices with USB interface use the USB interface for power supply, USB 2.0 interface and USB 3.0 interface on the PC are both acceptable. The current of the USB 2.0 interface is 500 mA.

ID2000M Series Devices with Network Interface

You can use the supplied cable to wire the device.

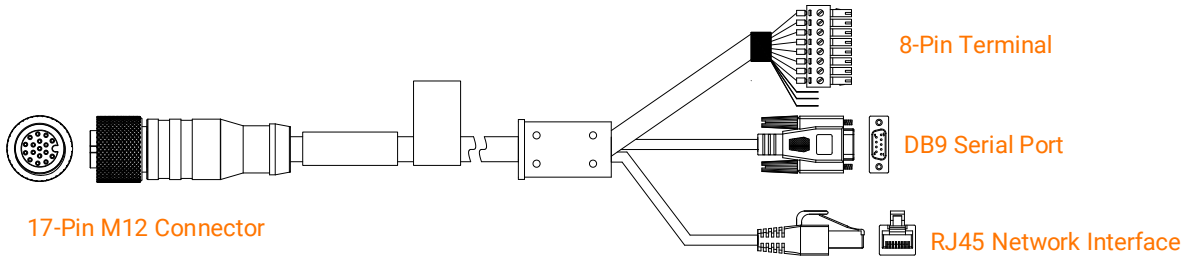


Figure 4-1 Device Wiring via Supplied Cable

Steps

1. Connect the 17-pin M12 female connector of the cable to the 17-pin M12 male connector of the SR cable on the device.
2. Connect the 8-pin terminal.
   It is recommended to connect the 8-pin terminal to the 8-pin IO box, and then connect the IO box to other devices. The VCC and GND of IO box can be connected to a suitable power adapter or industrial switching power supply for power supply. If I/O function is needed, you can connect other pins of the IO box to the external device, and refer to section ***I/O Wiring*** for details. If IO box is not used, you can refer to the wiring method of the fixed-focus devices.
3. Insert RJ45 network interface of the cable into a switch or a PC for data transmission.
4. (Optional) If RS-232 serial port communication is required, refer to section ***RS-232 Serial Port*** for wiring via DB9 serial port of the cable.

ID2000M Series Devices with USB Interface

If I/O function is not needed, use the supplied cable to wire the device.

Steps

1. Connect the 17-pin M12 female connector of the cable to the 17-pin M12 male connector of the SR cable on the device.
2. Connect the USB interface of the cable to the PC for power supply and data transmission.

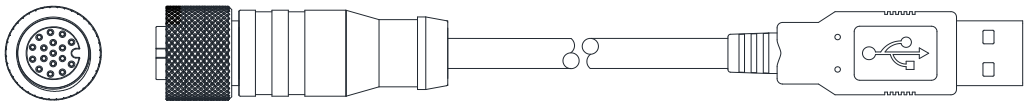


Figure 4-2 Device Wiring via Supplied Cable

If I/O function is needed, use the cable purchased from our company to wire the device.

Steps

1. Connect the USB interface of the cable to the PC.
2. For connection of other connectors, refer to wiring methods of ID2000M series devices with network interface for details.

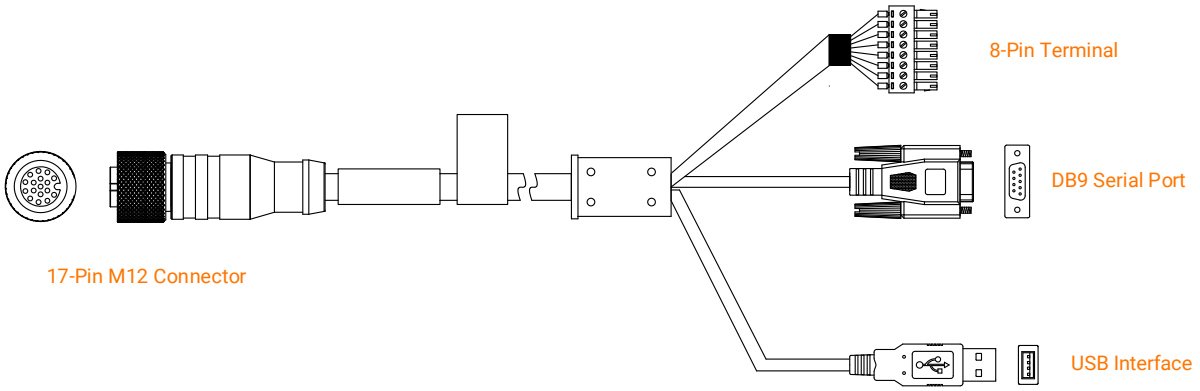


Figure 4-3 Device Wiring via Purchased Cable

Note

The 8-pin terminal and USB interface can be used for power supply. When both power supply methods are in operation simultaneously, power supply via the 8-pin terminal will prevail.

ID2000EM Series Devices with Network Interface

You can use the supplied cable to wire the device.

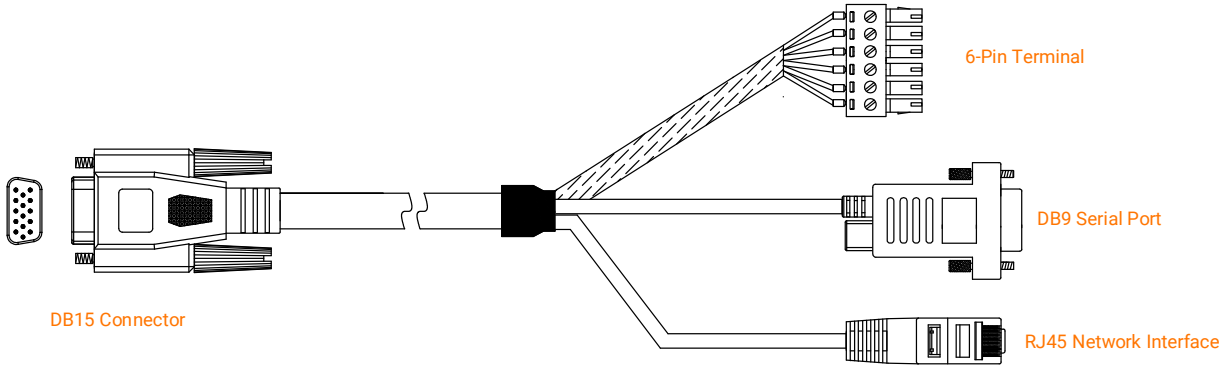


Figure 4-4 Device Wiring via Supplied Cable

Steps

1. Connect the DB15 female connector of the cable to the DB15 male connector of the SR cable on the device.
2. Connect the 6-pin terminal.
- If the 6-pin IO box is not used, connect the pins corresponding to the red and black lines in the 6-pin terminal to a suitable power adapter or industrial switching power supply. If I/O function is needed, you can connect other pins of the 6-pin terminal to the external device. Refer to section ***I/O Wiring*** for details.
- If the 6-pin IO box is used, connect the 6-pin terminal to the 6-pin IO box, and then connect the IO box to other devices. The VCC and GND of IO box can be connected to a suitable power adapter or industrial switching power supply for power supply. If I/O function is needed, you can connect other pins of the IO box to the external device.
3. Insert RJ45 network interface of the cable into a switch or a PC for data transmission.
4. Connect DB9 serial port of the cable to the power adapter for power supply.
5. (Optional) If RS-232 serial port communication is required, refer to section ***RS-232 Serial Port*** for wiring via DB9 serial port of the cable.

Note

The 6-pin terminal and DB9 serial port can be used for power supply. Do not use both power supply methods simultaneously. Otherwise, it may cause the burnout of the power supply.

ID2000EM Series Devices with USB Interface

If I/O function is not needed, use the supplied cable to wire the device.

Steps

1. Connect the DB15 female connector of the cable to the DB15 male connector of the SR cable on the device.
2. Connect the USB interface of the cable to the PC for power supply and data transmission.

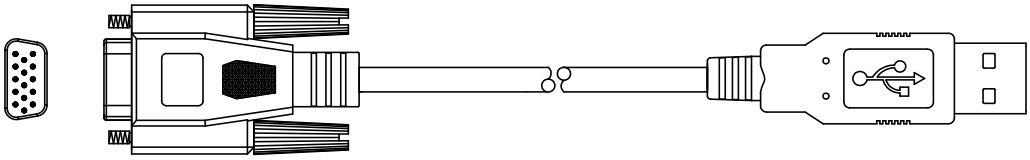


Figure 4-5 Device Wiring via Supplied Cable

If I/O function is needed, use the cable purchased from our company to wire the device.

Steps

1. Connect the USB interface of the cable to the PC.
2. For connection of other connectors, refer to wiring methods of ID2000EM series devices with network interface for details.

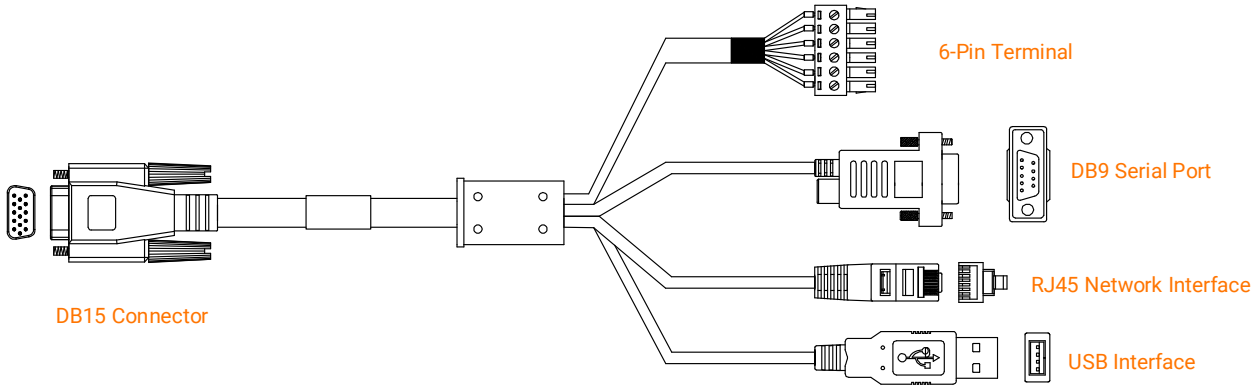


Figure 4-6 Device Wiring via Purchased Cable

Note

- The 6-pin terminal, DB9 serial port, and USB interface can be used for power supply. Do not use power supply methods via 6-pin terminal and DB9 serial port simultaneously. Otherwise, it may cause the burnout of the power supply. When the power supply via the USB interface is used with other two methods simultaneously, power supply via the 6-pin terminal or DB9 serial port will prevail.
- It is unnecessary to use the RJ45 network interface in the figure above.

4.3 Device Installation

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 devices are powered off during the installation.

The insulting bracket should be installed on the device first. Side mounting or back mounting is supported.

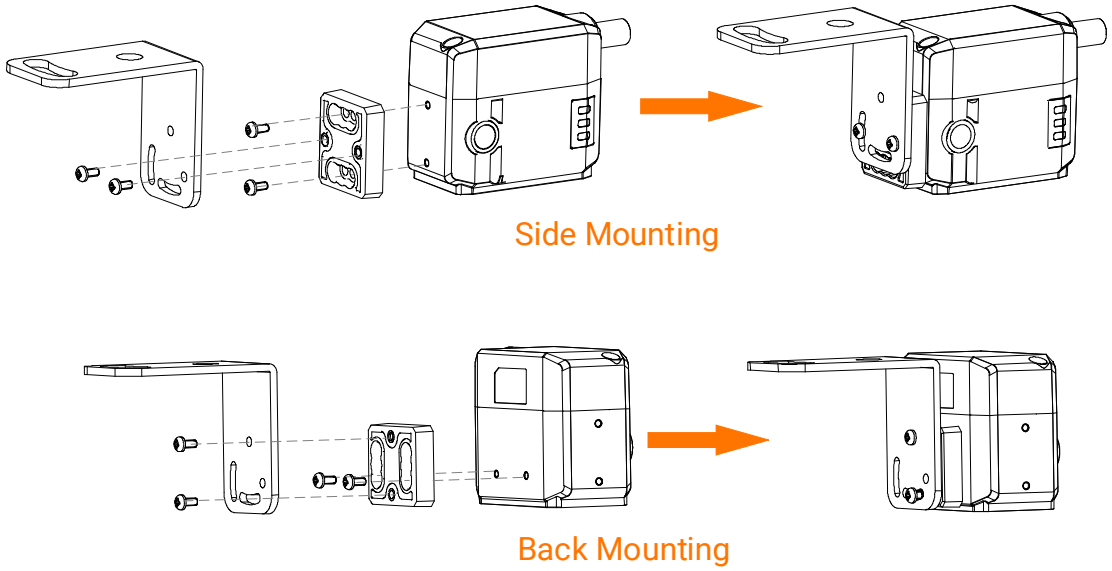


Figure 4-7 Insulting Bracket Installation

Steps

1. Use the screws to fix the insulting bracket to the mounting holes on the side or back of the device.
2. Fix the L-type bracket or other structural part to the insulting bracket.
3. Fix the device to the mechanical assembly via the L-type bracket or other structural part.

Chapter 5 Connector and Cable

This section introduces the device's connector and pin definitions.

Note

- The I/O functions may differ by the firmware version of the device. This document mainly introduces the functions supported by the following firmware versions. For unlisted firmware versions, you can contact the technical support.
  - Firmware version of V3.0.4 and above: ID2000EM series fixed-focus device
  - Firmware version of V3.0.0 and above: ID2000M series C-mount device, ID2000M series auto-focusing device, ID2000M series manual-focusing device with long focal length
  - Firmware version of V2.6.8 and above: ID2000M series manual-focusing device with short focal length
- The last column of the tables in this section indicates the trigger source name displayed in the client software. And the pins with actual usage will be introduced only.

5.1 ID2000M Series Device with Network Interface

The ID2000M series devices with network interface have the 17-pin M12 connector.

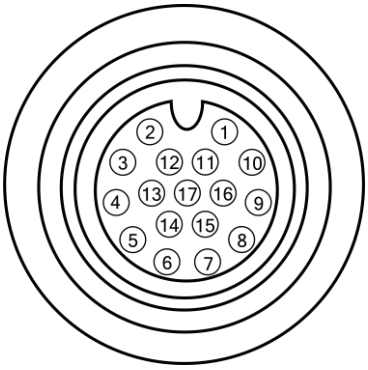


Figure 5-1 17-Pin Connector

The supplied cable is a 17-pin M12 cable to 8-pin terminal, RJ45, and DB9 serial port. The cable has converted the pins of device interface for power supply, I/O, RS-232 and data communication into the 8-pin terminal, RJ45 network interface, and DB9 serial port. You can use the cable directly without wiring.

Caution

The three open cables of the 8-pin terminal cannot be wired with the device, including purple/white open cable, pink open cable, and purple open cable.

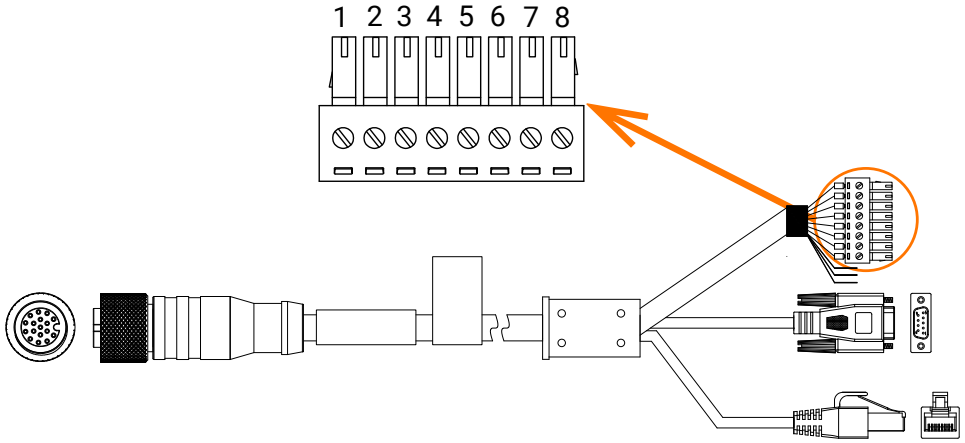


Figure 5-2 17-Pin M12 Cable to 8-Pin Terminal, RJ45, and DB9 Serial Port

The pin definitions may differ by device type.

ID2000M Series C-Mount Devices, ID2000M Series Auto-Focusing Devices, and ID2000M Series Manual-Focusing Devices with Long Focal Length

Refer to the table below for the pin definitions, trigger source, and the corresponding supplied cable.

Table 5-1 Pin Definition

No.	Signal	Description	Supplied Cable	Trigger Source
1	POWER_IN	Direct current power supply positive	Pin 8 of 8-pin terminal (Red)	--
2	OUT_COM	Output signal ground	Pin 6 of 8-pin terminal (Brown)	--
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	TX+	Fast Ethernet signal TX+	RJ45 network interface	--
7	RX-	Fast Ethernet signal RX-	RJ45 network interface	--
8	GPIO2	Non-isolated input	Pin 4 of 8-pin terminal (Blue/White)	Line 2
9	IN_COM	Input signal ground	Pin 3 of 8-pin terminal (Blue)	--
10	GPIO3	Non-isolated output	Pin 5 of 8-pin terminal (Brown/White)	Line 4
11	GND	Direct current power supply	Pin 7 of 8-pin terminal	--

No.	Signal	Description	Supplied Cable	Trigger Source
		negative	(Black)	
14	TX-	Fast Ethernet signal TX-	RJ45 network interface	--
15	RX+	Fast Ethernet signal RX+	RJ45 network interface	--
16	GPIO0	Bi-directional non-isolated I/O, and input is by default	Pin 1 of 8-pin terminal (Gray)	Input: Line 0 Output: Line 0
17	GPIO1	Bi-directional non-isolated I/O, and input is by default	Pin 2 of 8-pin terminal (White)	Input: Line 1 Output: Line 1

The 8-pin IO box should be used with the devices. Refer to section ***Installation Preparation*** for details. If you want to use the I/O function without IO box, refer to section ***I/O Wiring*** for details.

ID2000M Series Manual-Focusing Devices with Short Focal Length

Refer to the table below for the pin definitions, trigger source, and the corresponding supplied cable.

Table 5-2 Pin Definition

No.	Signal	Description	Supplied Cable	Trigger Source
1	POWER_IN	Direct current power supply positive	Pin 8 of 8-pin terminal (Red)	--
2	OUT_COM	Output signal ground	Pin 6 of 8-pin terminal (Brown)	--
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	TX+	Fast Ethernet signal TX+	RJ45 network interface	--
7	RX-	Fast Ethernet signal RX-	RJ45 network interface	--
8	GPIO2	Bi-directional non-isolated I/O, and output is by default	Pin 4 of 8-pin terminal (Blue/White)	Input: Line 3 Output: Line 3
9	IN_COM	Input signal ground	Pin 3 of 8-pin terminal (Blue)	--
10	GPIO3	Bi-directional non-isolated I/O, and output is by default	Pin 5 of 8-pin terminal (Brown/White)	Input: Line 4 Output: Line 4
11	GND	Direct current power supply negative	Pin 7 of 8-pin terminal (Black)	--

No.	Signal	Description	Supplied Cable	Trigger Source
14	TX-	Fast Ethernet signal TX-	RJ45 network interface	--
15	RX+	Fast Ethernet signal RX+	RJ45 network interface	--
16	GPIO0	Bi-directional non-isolated I/O, and input is by default	Pin 1 of 8-pin terminal (Gray)	Input: Line 0 Output: Line 0
17	GPIO1	Bi-directional non-isolated I/O, and input is by default	Pin 2 of 8-pin terminal (White)	Input: Line 1 Output: Line 1

The 8-pin IO box should be used with the devices. Refer to section ***Installation Preparation*** for details. If you want to use the I/O function without IO box, refer to section ***I/O Wiring*** for details.

5.2 ID2000EM Series Device with Network Interface

The ID2000EM series devices with network interface have the DB15 connector.

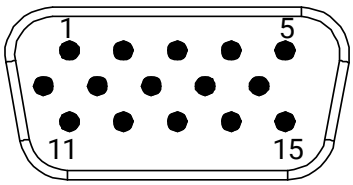


Figure 5-3 DB15 Connector

The supplied cable is a DB15 cable to 6-pin terminal, RJ45, and DB9 serial port. The cable has converted the pins of device interface for power supply, I/O, RS-232 and data communication into the 6-pin terminal, RJ45 network interface, and DB9 serial port. You can use the cable directly without wiring.

Note

The 6-pin terminal and DB9 serial port can be used for power supply. Do not use both power supply methods simultaneously. Otherwise, it may cause the burnout of the power supply.

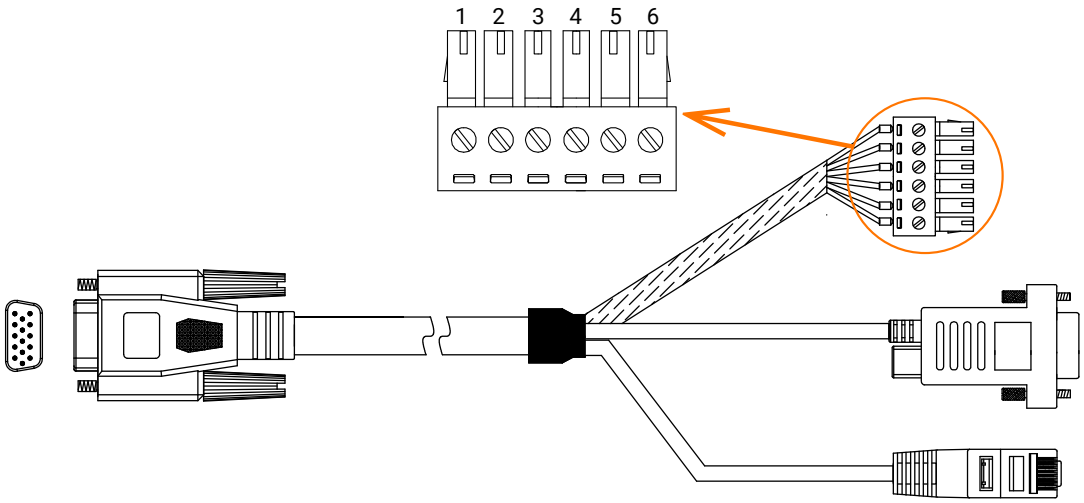


Figure 5-4 DB15 Cable to 6-Pin Terminal, RJ45, and DB9 Serial Port

Refer to the table below for the pin definitions, trigger source, and the corresponding supplied cable.

Table 5-3 Pin Definition

No.	Signal	Description	Supplied Cable	Trigger Source
1	POWER_IN	Direct current power supply positive	Pin 6 of 6-pin terminal (Red)	--
2	RS232_TX	RS-232 serial port output	DB9 female serial port	--
3	RS232_RX	RS-232 serial port input	DB9 female serial port	--
4	GND	Direct current power supply negative	Pin 5 of 6-pin terminal (Black)	--
5	OPTO_IN0	Non-isolated input	Pin 1 of 6-pin terminal (Blue)	Line 0
6	TX+	Fast Ethernet signal TX+	RJ45 network interface	--
7	RX-	Fast Ethernet signal RX-	RJ45 network interface	--
8	OPTO_OUT0	Non-isolated output	Pin 2 of 6-pin terminal (Gray)	Line 3
10	IO_2	Non-isolated output	Pin 3 of 6-pin terminal (Brown)	Line 4
13	IO_1	Non-isolated input	Pin 4 of 6-pin terminal (Purple)	Line 1
14	TX-	Fast Ethernet signal TX-	RJ45 network interface	--
15	RX+	Fast Ethernet signal RX+	RJ45 network interface	--

Note

Refer to section *I/O Wiring* for wiring. If you want to use the 6-pin IO box purchased from our company, refer to section *Installation Preparation* for details.

5.3 ID2000M Series Devices with USB Interface (Without I/O Function)

The ID2000M series devices with USB interface have the 17-pin M12 connector.

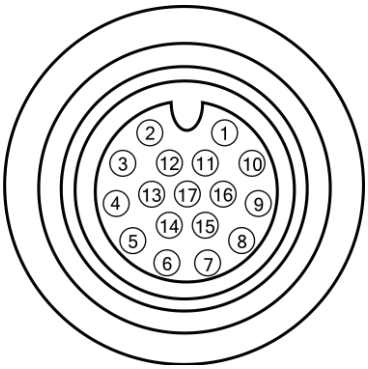


Figure 5-5 17-Pin Connector

The supplied cable is a 17-pin M12 cable to USB interface. It provides data communication and power supply via the USB interface, but cannot provide I/O function.

Note

If you need to use the I/O function, refer to section *ID2000M Series Devices with USB Interface (With I/O Function)* for details.

Figure 5-6 17-Pin M12 Cable to USB Interface

Refer to the table below for the pin definitions and the corresponding supplied cable.

Table 5-4 Pin Definition

No.	Signal	Description	Supplied Cable
1	POWER_IN	Direct current power supply positive	USB
3	USB_DM	USB DM signal	USB
11	GND	Direct current power supply negative	USB
12	USB_DP	USB DP signal	USB

5.4 ID2000EM Series Devices with USB Interface (Without I/O Function)

The ID2000EM series devices with USB interface have the DB15 connector.

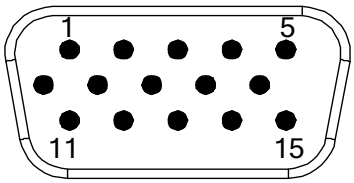


Figure 5-7 DB15 Connector

The supplied cable is a DB15 cable to USB interface. It provides data communication and power supply via the USB interface, but cannot provide I/O function.

Note

If you need to use the I/O function, refer to section ***ID2000EM Series Devices with USB Interface (With I/O Function)*** for details.

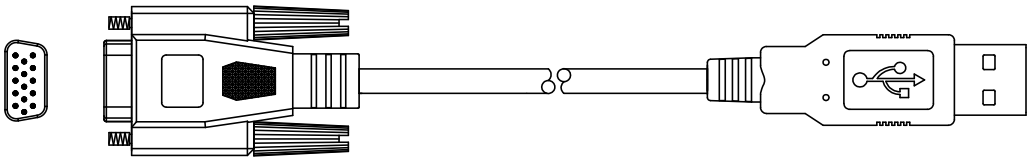


Figure 5-8 DB15 Cable to USB Interface

Refer to the table below for the pin definitions and the corresponding supplied cable.

Table 5-5 Pin Definition

No.	Signal	Description	Supplied Cable
4	GND	Direct current power supply negative	USB
9	POWER_IN	Direct current power supply positive	USB
11	USB_DM	USB DM signal	USB
12	USB_DP	USB DP signal	USB

5.5 ID2000M Series Devices with USB Interface (With I/O

Function)

The ID2000M series devices with USB interface have the 17-pin M12 connector.

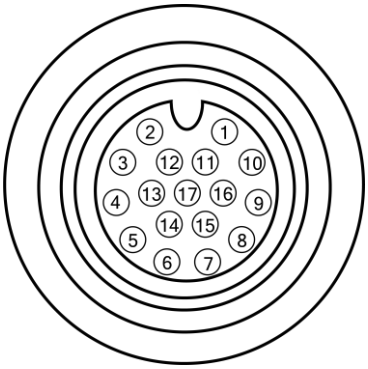


Figure 5-9 17-Pin Connector

If the I/O function is needed, it is recommended to purchase the 17-pin M12 cable to 8-pin terminal, USB, and DB9 serial port from our company.

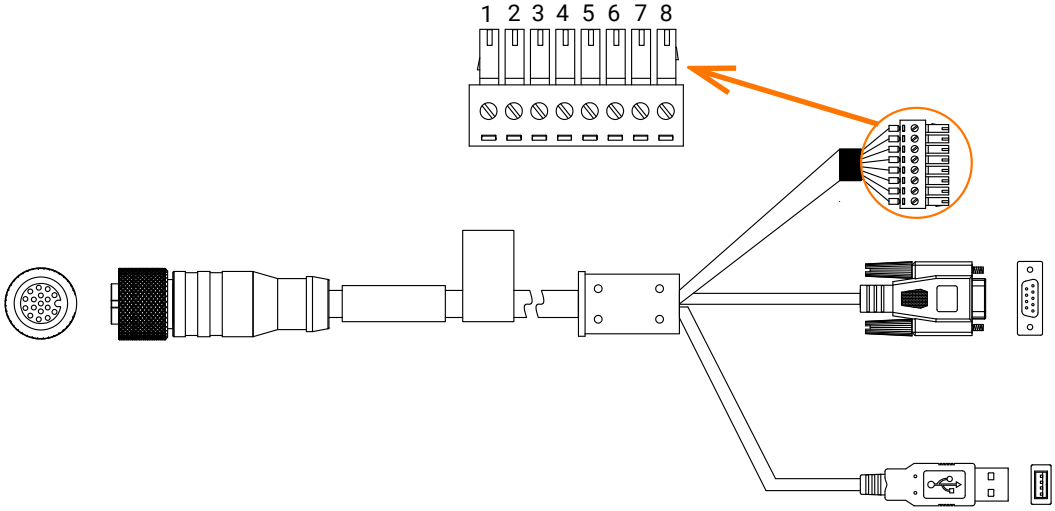


Figure 5-10 17-Pin M12 Cable to 8-Pin Terminal, USB, and DB9 Serial Port

The pin definitions may differ by device type.

ID2000M Series C-Mount Devices, ID2000M Series Auto-Focusing Devices, and ID2000M Series Manual-Focusing Devices with Long Focal Length

Refer to the table below for the pin definitions, trigger source, and the corresponding supplied cable.

Table 5-6 Pin Definition

No.	Signal	Description	Supplied Cable	Trigger Source
1	POWER_IN	Direct current power supply	Pin 8 of 8-pin terminal	--

No.	Signal	Description	Supplied Cable	Trigger Source
		positive	(Red)	
2	OUT_COM	Output signal ground	Pin 6 of 8-pin terminal (Brown)	--
3	USB_DM	USB DM signal	USB	--
4	RS232_TX	RS-232 serial port output	DB9 female serial port	--
5	RS232_RX	RS-232 serial port input	DB9 female serial port	--
8	GPIO2	Non-isolated input	Pin 4 of 8-pin terminal (Blue/White)	Line 2
9	IN_COM	Input signal ground	Pin 3 of 8-pin terminal (Blue)	--
10	GPIO3	Non-isolated output	Pin 5 of 8-pin terminal (Brown/White)	Line 4
11	GND	Direct current power supply negative	• Pin 7 of 8-pin terminal (Black) • USB	--
12	USB_DP	USB DP signal	USB	--
16	GPIO0	Bi-directional non-isolated I/O, and input is by default	Pin 1 of 8-pin terminal (Gray)	Input: Line 0 Output: Line 0
17	GPIO1	Bi-directional non-isolated I/O, and input is by default	Pin 2 of 8-pin terminal (White)	Input: Line 1 Output: Line 1

The 8-pin IO box should be used with the devices. Refer to section ***Installation Preparation*** for details. If you want to use the I/O function without IO box, refer to section ***I/O Wiring*** for details.

ID2000M Series Manual-Focusing Devices with Short Focal Length

Refer to the table below for the pin definitions, trigger source, and the corresponding supplied cable.

Table 5-7 Pin Definition

No.	Signal	Description	Supplied Cable	Trigger Source
1	POWER_IN	Direct current power supply positive	Pin 8 of 8-pin terminal (Red)	--
2	OUT_COM	Output signal ground	Pin 6 of 8-pin terminal (Brown)	--

No.	Signal	Description	Supplied Cable	Trigger Source
3	USB_DM	USB DM signal	USB	--
4	RS232_TX	RS-232 serial port output	DB9 female serial port	--
5	RS232_RX	RS-232 serial port input	DB9 female serial port	--
8	GPIO2	Bi-directional non-isolated I/O, and output is by default	Pin 4 of 8-pin terminal (Blue/White)	Input: Line 3 Output: Line 3
9	IN_COM	Input signal ground	Pin 3 of 8-pin terminal (Blue)	--
10	GPIO3	Bi-directional non-isolated I/O, and output is by default	Pin 5 of 8-pin terminal (Brown/White)	Input: Line 4 Output: Line 4
11	GND	Direct current power supply negative	Pin 7 of 8-pin terminal (Black)	--
12	USB_DP	USB DP signal	USB	--
16	GPIO0	Bi-directional non-isolated I/O, and input is by default	Pin 1 of 8-pin terminal (Gray)	Input: Line 0 Output: Line 0
17	GPIO1	Bi-directional non-isolated I/O, and input is by default	Pin 2 of 8-pin terminal (White)	Input: Line 1 Output: Line 1

The 8-pin IO box should be used with the devices. Refer to section ***Installation Preparation*** for details. If you want to use the I/O function without IO box, refer to section ***I/O Wiring*** for details.

5.6 ID2000EM Series Device with USB Interface (With I/O Function)

The ID2000EM series devices with USB interface have the DB15 connector.

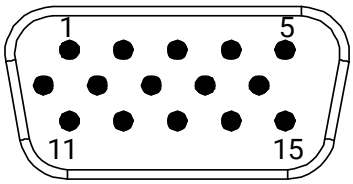


Figure 5-11 DB15 Connector

If the I/O function is needed, it is recommended to purchase the DB15 cable to 6-pin terminal, USB, RJ45, and DB9 serial port from our company. The cable has converted the pins of device interface for power supply, I/O, RS-232 and data communication into the 6-pin terminal, USB, RJ45 network interface (not required), and DB9 serial port. You can use

the cable directly without wiring.

Note

The 6-pin terminal, DB9 serial port, and USB interface can be used for power supply. Do not use power supply methods via 6-pin terminal and DB9 serial port simultaneously. Otherwise, it may cause the burnout of the power supply. When the power supply via the USB interface is used with other two methods simultaneously, power supply via the 6-pin terminal or DB9 serial port will prevail.

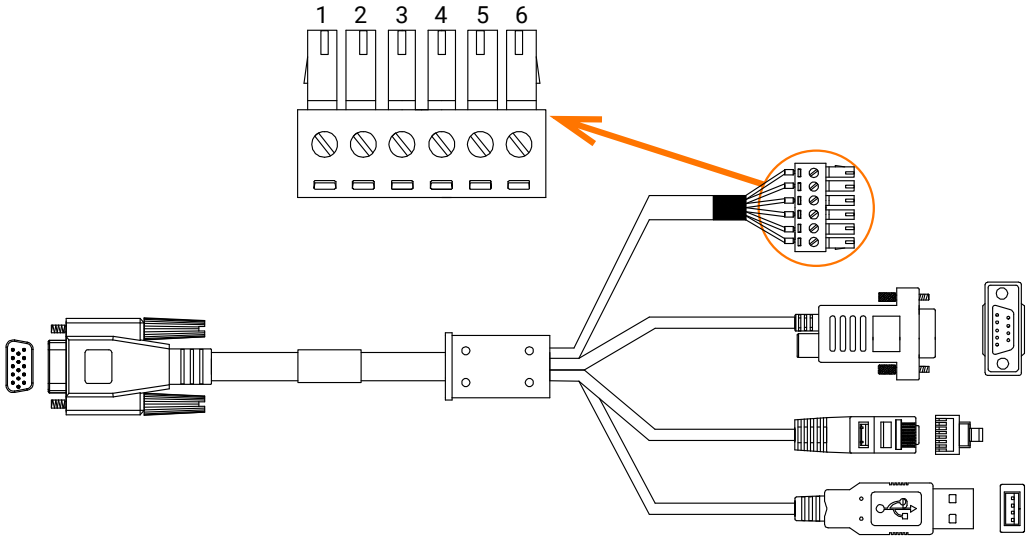


Figure 5-12 DB15 Cable to 6-Pin Terminal, USB, RJ45, and DB9 Serial Port

Refer to the table below for the pin definitions, trigger source, and the corresponding supplied cable.

Table 5-8 Pin Definition

No.	Signal	Description	Supplied Cable	Trigger Source
1	POWER_IN	Direct current power supply positive	• Pin 6 of 6-pin terminal (Red) • DB9 female serial port	--
2	RS232_TX	RS-232 serial port output	DB9 female serial port	--
3	RS232_RX	RS-232 serial port input	DB9 female serial port	--
4	GND	Direct current power supply negative	• Pin 5 of 6-pin terminal (Black) • DB9	--
5	OPTO_IN0	Non-isolated input	Pin 1 of 6-pin terminal (Blue)	Line 0
8	OPTO_OUT0	Non-isolated output	Pin 2 of 6-pin terminal (Gray)	Line 3

No.	Signal	Description	Supplied Cable	Trigger Source
9	POWER_IN	Direct current power supply positive	USB	--
10	IO_2	Non-isolated output	Pin 3 of 6-pin terminal (Brown)	Line 4
11	USB_DM	USB DM signal	USB	--
12	USB_DP	USB DP signal	USB	--
13	IO_1	Non-isolated input	Pin 4 of 6-pin terminal (Purple)	Line 1

Note

Refer to section ***I/O Wiring*** for wiring. If you want to use the 6-pin IO box purchased from our company, refer to section ***Installation Preparation*** for details.

Chapter 6 I/O Electrical Feature and Wiring

This section introduces the I/O electrical features and wiring methods of the device.

Note

This section only introduces the wiring methods between the device and the other external devices. If you need to wire the device via the IO box, scan the QR codes below to get the operating guide of the IO box.

Table 6-1 Operating Guide of IO Box

IO Box	Operating Guide
6-Pin IO Box	
8-Pin IO Box V1.0	
8-Pin IO Box V2.0	

6.1 Non Opto-Isolated I/O

The I/O electrical features and wiring methods may differ by the device model.

- ID2000EM series fixed-focus device: non opto-isolated input × 2 and non opto-isolated output × 2
- ID2000M series manual-focusing device with short focal length: non opto-isolated

bidirectional I/O × 4, configuring to input or output
  - 0 and 1: Control by line0_1, input by default
  - 2 and 3: Control by line2_3, output by default
- ID2000M series C-mount device, ID2000M series auto-focusing device, and ID2000M series manual-focusing device with long focal length: non opto-isolated input × 1, non opto-isolated output × 1, and non opto-isolated bidirectional I/O × 2 (input by default)

6.1.1 Non Opto-Isolated Input Circuit

The internal circuit, electrical feature, and logic level of non opto-isolated input signal are as follows.

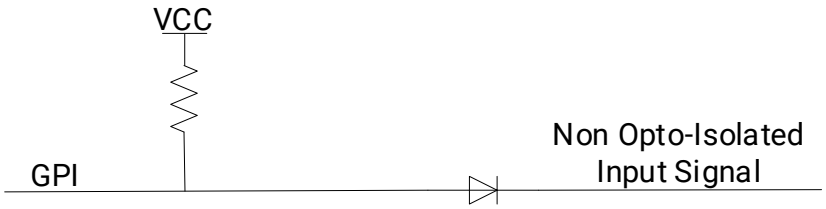


Figure 6-1 Internal Circuit of Input Signal

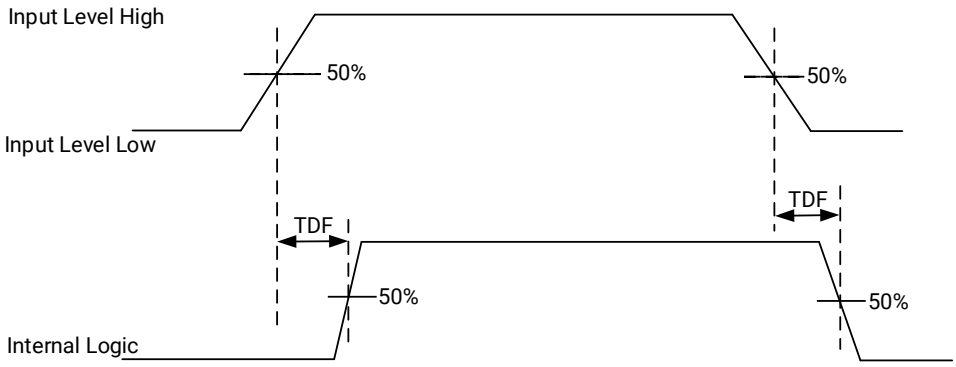


Figure 6-2 Input Logic Level

Table 6-2 Input Electrical Feature

Parameter Name	Parameter Symbol	Value
Input Logic Level Low	VL	● ID2000M series devices: 1 VDC ● ID2000EM series devices: 0.6 VDC
Input Logic Level High	VH	2 VDC
Input Falling Delay	TDF	200 ns
Input Rising Delay	TDR	1 μs

6.1.2 Non Opto-Isolated Output Circuit

The internal circuit and electrical feature of the non opto-isolated output signal are as follows.

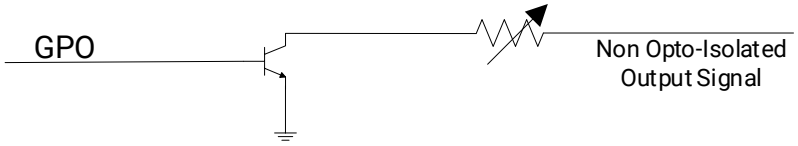


Figure 6-3 Internal Circuit of Output Signal

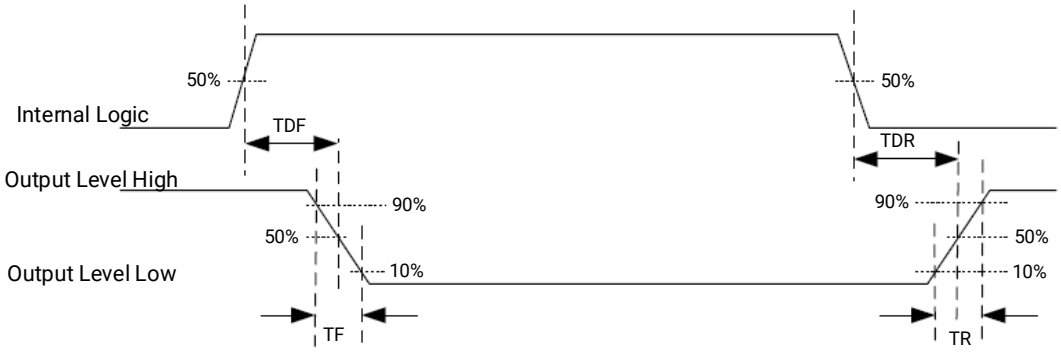


Figure 6-4 Output Logic Level

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

Table 6-3 Output Electrical Feature

Parameter Name	Parameter Symbol	Value
Output Logic Level Low	VL	500 mV
Output Logic Level High	VH	12 VDC
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 among different pull-up voltages, output logic level low, and output logic level high is shown below.

Table 6-4 Parameters of Output Logic Level Low and High

Pull-Up Voltage	Output Logic Level Low (VL)	Output Logic Level High (VH)
3.3 VDC	180 mV	3.3 VDC
5 VDC	260 mV	5 VDC

Pull-Up Voltage	Output Logic Level Low (VL)	Output Logic Level High (VH)
12 VDC	500 mV	12 VDC
24 VDC	900 mV	24 VDC

6.1.3 Non Opto-Isolated Bi-Directional I/O Circuit

The non opto-isolated bi-directional signal in I/O signal can be use as input signal or output signal according to demands. Its internal circuit is shown below. GPI circuit is used for input and GPO circuit for output.

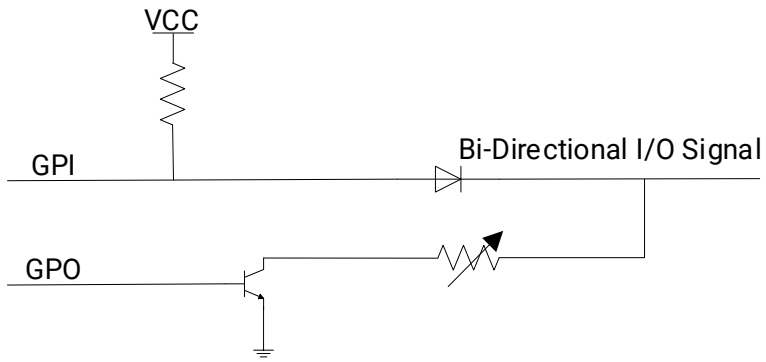


Figure 6-5 Internal Circuit of Bi-Directional Signal

Configured as Input Signal

The logic level and electrical feature when the bi-directional I/O is configured as input signal are as follows.

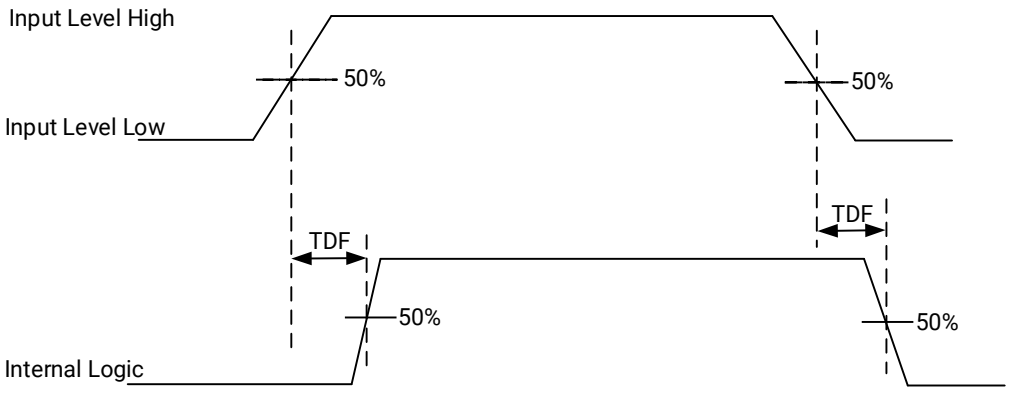


Figure 6-6 Input Logic Level

Table 6-5 Input Electrical Feature

Parameter Name	Parameter Symbol	Value
Input Logic Level Low	VL	1 VDC

Parameter Name	Parameter Symbol	Value
Input Logic Level High	VH	2 VDC
Input Falling Delay	TDF	200 ns
Input Rising Delay	TDR	1 μs

Configured as Output Signal

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

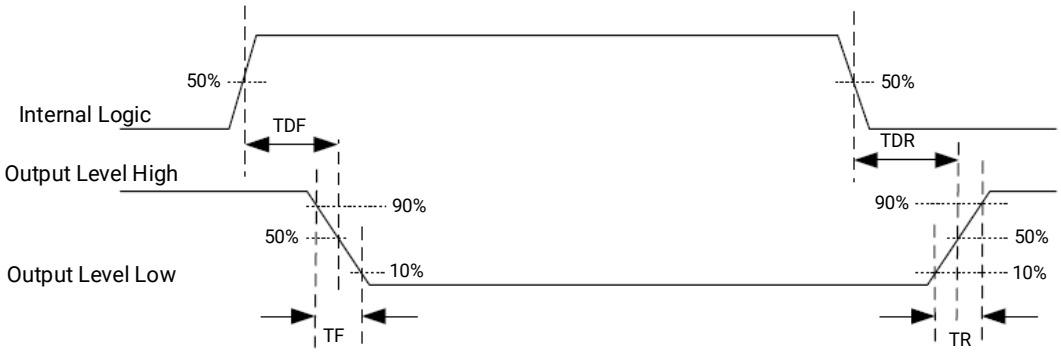


Figure 6-7 Output Logic Level

Table 6-6 Output Electrical Feature

Parameter Name	Parameter Symbol	Value
Output Logic Level Low	VL	500 mV
Output Logic Level High	VH	12 VDC
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 among different pull-up voltages, output logic level low, and output logic level high is shown below.

Table 6-7 Parameters of Output Logic Level Low and High

Pull-Up Voltage	Output Logic Level Low (VL)	Output Logic Level High (VH)
3.3 VDC	180 mV	3.3 VDC
5 VDC	260 mV	5 VDC
12 VDC	500 mV	12 VDC

Pull-Up Voltage	Output Logic Level Low (VL)	Output Logic Level High (VH)
24 VDC	900 mV	24 VDC

6.1.4 I/O Wiring

The device can receive input signals from external devices and output signals to external devices. This section introduces how to wire the device's I/O.

Note

- The input and output signals mentioned in this section are the bi-directional I/O signal.
- The voltage of VCC should be equal to or less than that of PWR. Otherwise, the device's output signal may have exception.
- The device figures below are for reference only, and the actual one you got should prevail.

Input/output signal wiring may differ by the type of the external device.

PNP Device

- When the bi-directional I/O is set as the non opto-isolated input signal for connecting to the PNP device, you should use a 1 KΩ pull-down resistor.

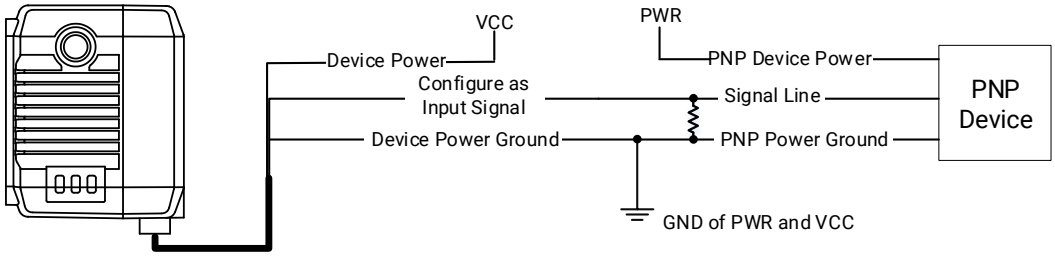


Figure 6-8 Input Signal Connecting to PNP Device

- When the bi-directional I/O is set as the non opto-isolated output signal for connecting to the PNP device, the wiring diagram is shown below.

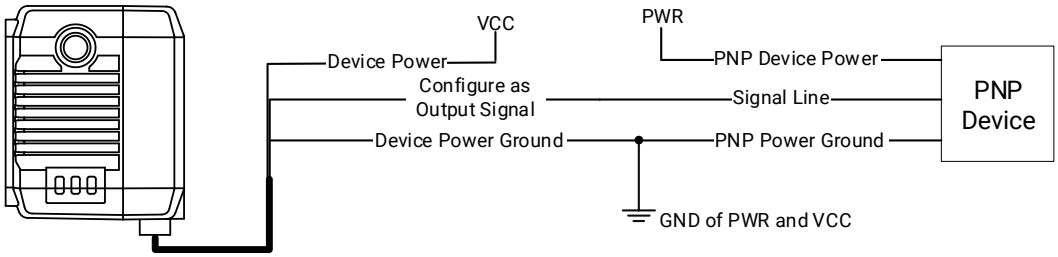


Figure 6-9 Output Signal Connecting to PNP Device

NPN Device

- When the bi-directional I/O is set as the non opto-isolated input/output signal for connecting to the NPN device, you should use a 1 KΩ pull-up resistor.

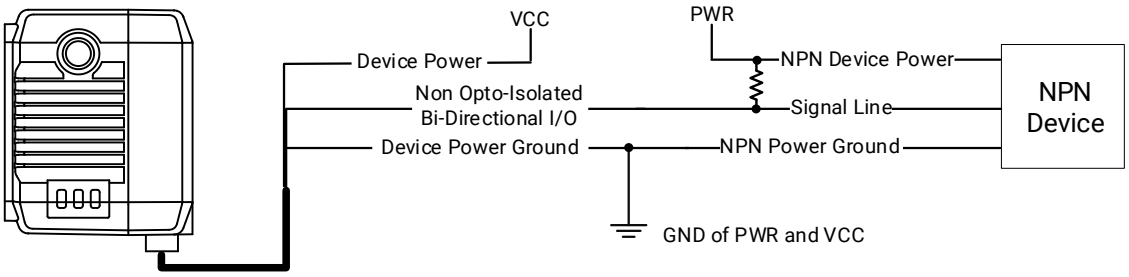


Figure 6-10 Input/Output Signal Connecting to NPN Device

Switch

- When the bi-directional I/O is set as the non opto-isolated input signal for connecting to the switch, the wiring diagram is shown below.

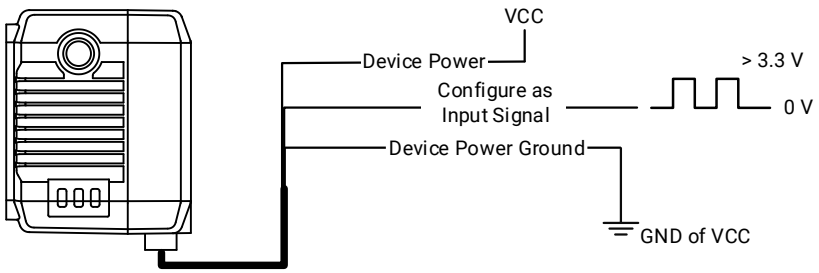


Figure 6-11 Input Signal Connecting to Switch

6.2 RS-232 Serial Port

The device supports outputting data via RS-232 serial port, and you can set serial port communication via the client software. Refer to section ***Set Serial*** for details.

The supplied cable has a DB9 female serial port. Refer to the figure and table below for pin definitions.

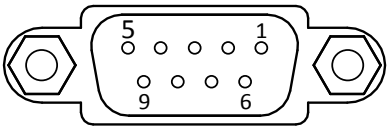


Figure 6-12 DB9 Female Serial Port

Table 6-8 Pin Definitions

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

Chapter 7 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 and device network, connect the device to the client software, etc.

7.1 Install Client Software

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

Steps

Note

- The client software is compatible with 32/64-bit Windows 7/10, 64-bit Windows 11, and 32/64-bit Linux operating systems. Here we take Windows as an example.
- For the devices with USB interface, only the client software with version of V2.3.0 and above in Windows system is supported, and the client software with Linux system is not supported.
- The client software with version of V2.3.0 and above in Windows system has integrated the USB driver. If the driver is not recognized, you can install it.
- You can get the client software installation package from ***https://en.hikrobotics.com/***. It is recommended to use the latest version of the client software.
- The graphic user interface may differ by different 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**.

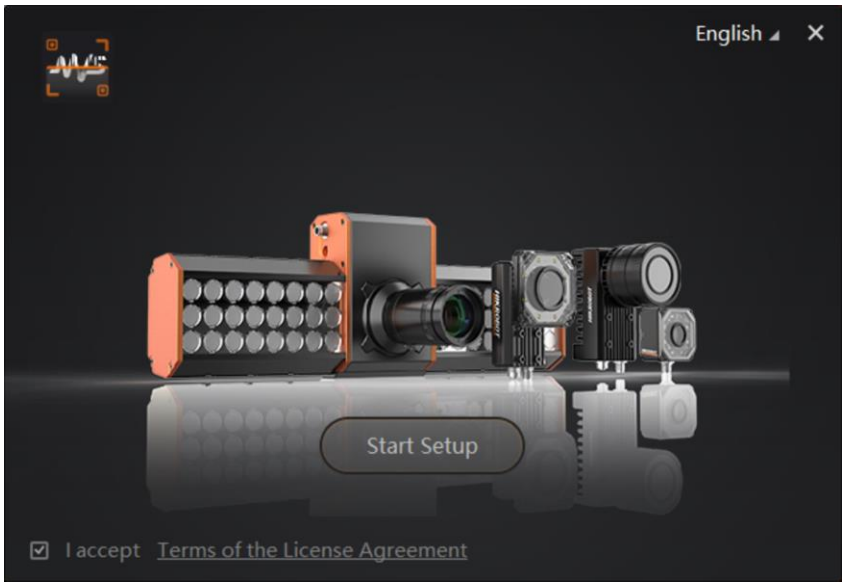


Figure 7-1 Installation Interface

6. Finish the installation according to the interface prompts.

7.2 Set PC Environment

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

7.2.1 Turn off Firewall for Device with Network Interface

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 7 system: Click **Start** → **Control Panel** → **Windows Firewall**.
   - Windows 10 system: Click **Start** → **Control Panel** → **System and Security** → **Windows Defender Firewall**.
   - Windows 11 system: Click **Start** → **Settings** → **Privacy & security** → **Windows Security** → **Firewall & network protection**.
2. For Windows 7 and 10 system, click **Turn Windows Defender Firewall on or off** on the left. For Windows 11, select the network and turn off in **Microsoft Defender Firewall**.
3. Select **Turn off Windows Defender Firewall (not recommended)**.

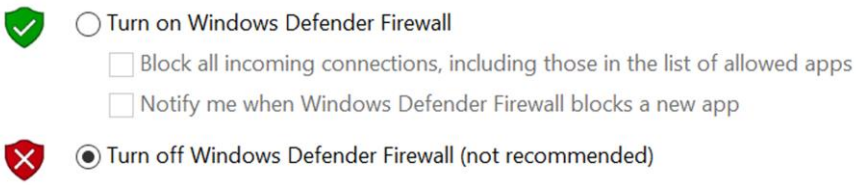


Figure 7-2 Windows Defender Firewall

4. Click **OK**.

7.2.2 Set PC Network for Device with Network Interface

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.

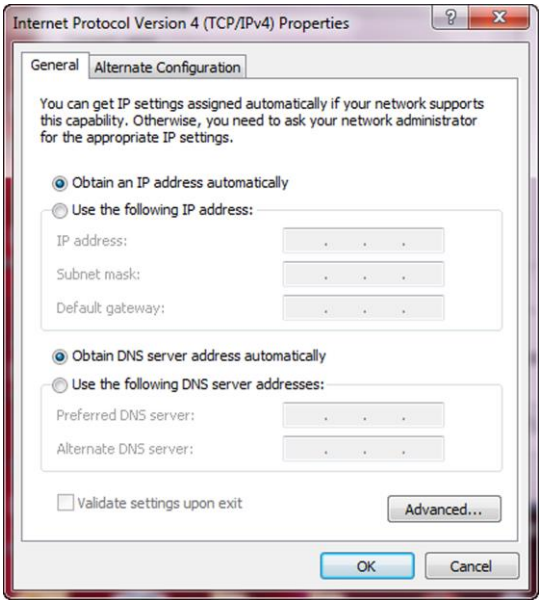


Figure 7-3 Set PC Network

7.2.3 Check USB Drive for Device with USB Interface

Check the USB drive on the PC before using the device with USB interface. After connecting the device with USB interface 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.
- You can search the device with USB interface in **GigE** of **Device Connection**.
- For ID2000EM series device, you need to execute “remote NDIS compatible device” operation when updating it firmware. Contact the technical support if necessary.

7.3 Set Device Network and Connect to Client Software

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, and click **Modify IP**.
4. Set the IP address of the device in the same network segment with the PC, and click **OK**.

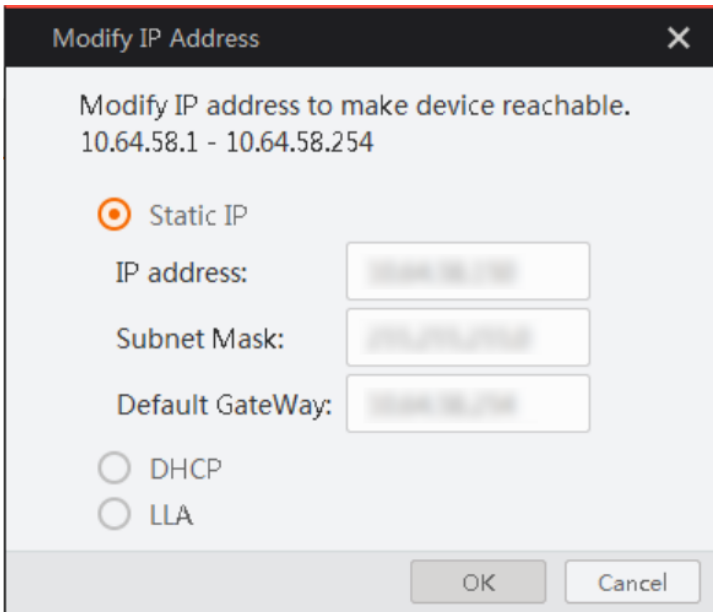


Figure 7-4 Modify IP Address

5. Double click the device in device list or click to connect it to the client software.

6. (Optional) Go to **Feature Tree** → **Device Control** and enable **Private Discovery Protocol**. The device will only be enumerated through a proprietary protocol, preventing third-party software from occupation. Any changes to this setting require configuration saving and device restart to take effect.

Figure 7-5 Private Discovery Protocol Enable

7. (Optional) Go to **Feature Tree** → **Device Control** and enable **Preventing Illegal Occupation** to prevent IP address being occupied by other devices.
8. (Optional) Go to **Feature Tree** → **Device Control** and enable **Force IP Enable** if you want to edit static IP address. This parameter is enabled by default.

Figure 7-6 Preventing Illegal Occupation and Force IP Enable

Chapter 8 Basic Operation

8.1 Client Software Layout

The main window of the client software is displayed after the device is connected to the client software.

Note

- The graphic user interface may differ by different versions of client software you use.
- Refer to the user manual of the client software for detailed operation guide.

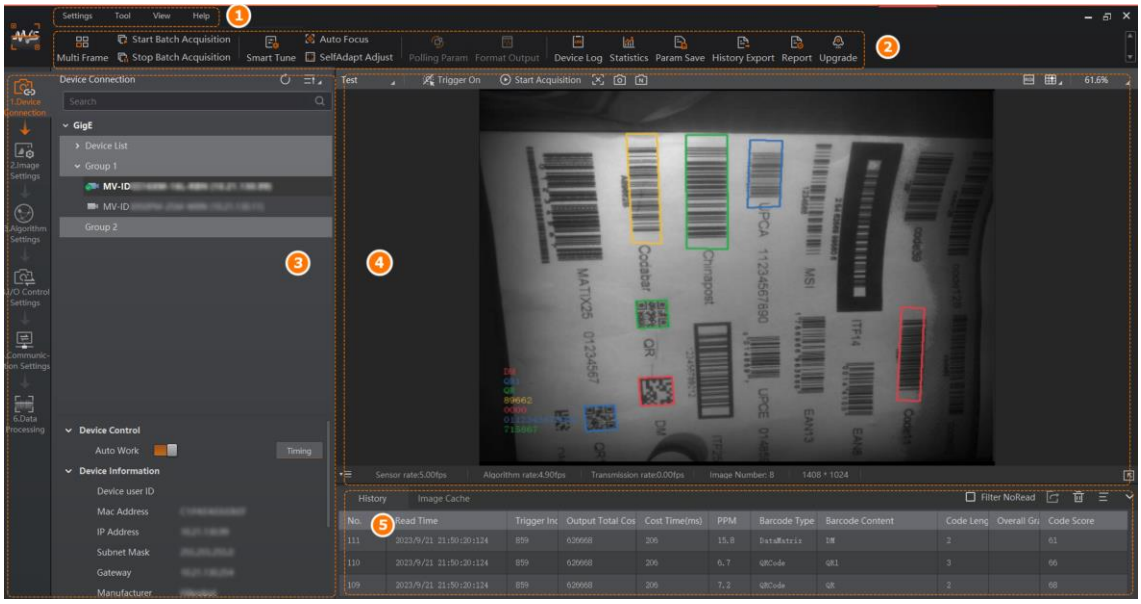


Figure 8-1 Main Window

Table 8-1 Main Window Description

No.	Name	Description
1	Menu Bar	Provides access to function modules including Settings, Tool, View, and Help.
2	Control Toolbar	Provides access to functions such as starting/ending batch acquisition, switching the window division mode, viewing real-time statistics during acquisition, and viewing device logs, and quick access to tools such as Smart Tune, Auto Focus, and SelfAdapt Adjust.
3	Device Configuration	The wizard for device configurations. In the Device Information field, you can view information about a

No.	Name	Description
	Wizard Panel	device and its corresponding network interface. You can connect device(s) to the Software, manage devices by groups, and configure parameters related to image settings, algorithm settings, I/O control settings, communication settings, data processing, and configuration management.
4	Live View Window	Displays the live view of the selected device(s).
5	History Panel	Displays the code reading history of device(s). You can also view the real-time reading results during acquisition.

The device configuration wizard panel and control toolbar help you perform some basic operations of the device.

Table 8-2 Device Configuration Wizard Panel 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 code type, set code quantity, etc.
4	I/O Control Settings	You can set parameters related to input and output.
5	Communication Settings	You can select different communication protocols, and set parameters for output result.
6	Data Processing	You can set filtering rule for output result.
7	Configuration Management	You can save and load user parameters, and restart the device.

8.2 Basic Operation

Steps

1. After connecting the device, go to the left corner of live view window, and select the running mode.

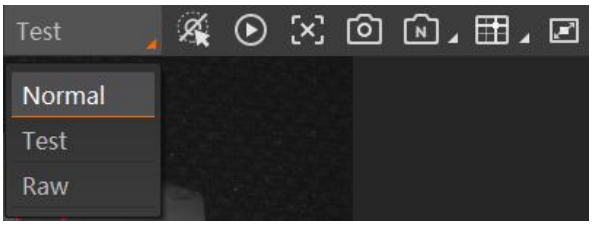


Figure 8-2 Select Running Mode

Note

Stopping the real-time acquisition is required before selecting the running mode.

Table 8-3 Running 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.

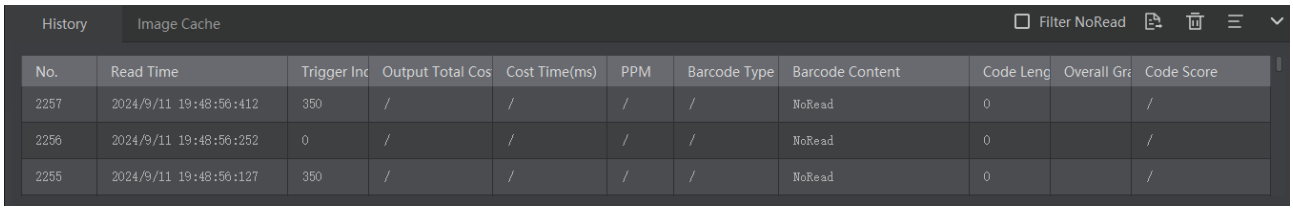
2. Click in the live view window to view images and the code reading effect.

Figure 8-3 Code Reading Effect

Note

If the effect is not very good, you can go to **Image Settings** to adjust related parameters, such as exposure time, gain, Gamma, and light source. For the ID2000M series manual-focusing devices, you can also adjust the focus knob on the device; for the ID2000M series auto-focusing devices, adjust the image via the auto focusing function.

3. (Optional) Go to history panel to view codes recognized by the device.



No.	Read Time	Trigger Inc	Output Total Cos	Cost Time(ms)	PPM	Barcode Type	Barcode Content	Code Leng	Overall Gra	Code Score
2257	2024/9/11 19:48:56:412	350	/	/	/	/	NoRead	0		/
2256	2024/9/11 19:48:56:252	0	/	/	/	/	NoRead	0		/
2255	2024/9/11 19:48:56:127	350	/	/	/	/	NoRead	0		/

Figure 8-4 History Record

Note

The cost time and PPM are supported by some device models and firmware versions. If not supported, these two parameters will be displayed with a slash (/).

Chapter 9 Device Settings

9.1 Feature Tree Introduction

After the device is connected to the client software, and you can right click the device in **Device Connection**, and click **Feature Tree**.

Note

The parameters of the feature tree may differ by device models and firmware versions.

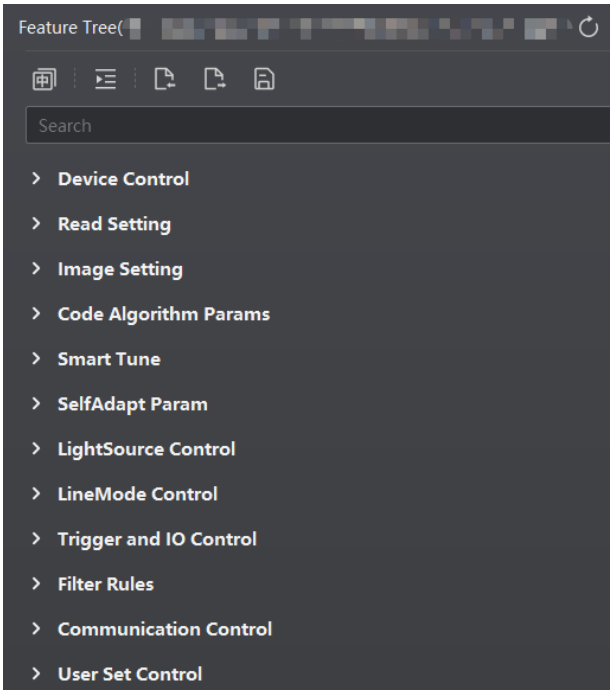


Figure 9-1 Feature Free

Table 9-1 Feature Tree Description

Name	Description
Device Control	It allows you to view the device's information, edit its name, and restart device.
Read Setting	It allows you to set the device's running mode and select code types.
Image Setting	It allows you to set frame rate, exposure, gain, Gamma, etc.
Algorithm Control	It allows you to set algorithm-related parameters.

Name	Description
Focus Control	It allows you to set the device's focus mode and related parameters.
SelfAdapt Param	It allows the device to automatically adjust exposure, gain, Gamma and other parameters to have a better code reading effect.
LightSource Control	It allows you to set the light source's parameters.
LineMode Control	It allow you to customize the specific line as input or output according to actual demands.
Trigger and IO Control	It allows you to set parameters of input and output.
Stop Trigger Control	It allows you to stop device 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.
Filter Rules	It allows you to set the filtering rule of codes.
Communication Control	It allows you to set parameters related to different communication protocols.
MultiCamera Control	It allows you to set parameters of multi-camera to let them operate in a collaborative way.
Result Setting Control	It allows you to set parameters of outputted contents.
User Set Control	It allows you to save and load configured user set.

9.2 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.

9.2.1 Set Image

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

burst frame count, etc. in **Image Settings** area.

Table 9-2 Set Image Parameters

Name	Description
Exposure Time(μs)	You can increase exposure time to improve image brightness. **Note** To some extent, increasing the exposure time will reduce the acquisition frame rate, and impact image quality.
Gain(dB)	You can increase gain to improve image brightness. **Note** 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(fps)	Acquisition frame rate refers to the image quantity that is acquired by the device per second. **Note** Increasing the exposure time will reduce the acquisition frame rate, and decreasing the exposure time will increase the acquisition frame rate.
Acquisition Burst Frame Count	Acquisition burst frame count refers to the output image quantity 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. Refer to section ***Set Polling*** for details.

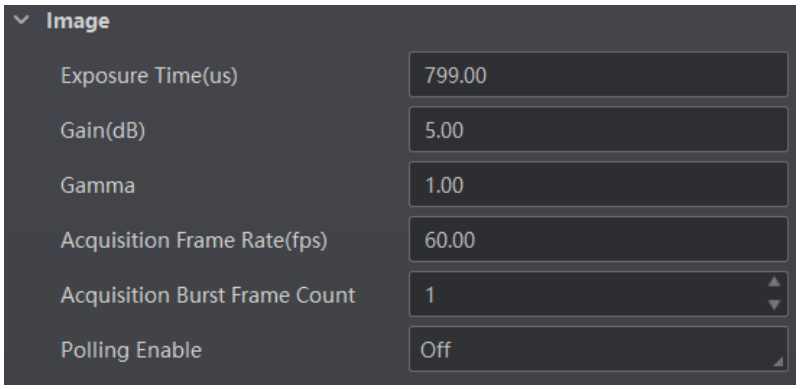


Figure 9-2 Set Image Parameters

Note

The value range of exposure time and gain, and the maximum value of acquisition frame rate are related to the device model. Refer to the device's specifications for specific parameters.

9.2.2 Set Polling

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

Note

- Stopping the real-time acquisition is required before setting the polling function.
- It is recommended to use the polling function under the normal operation mode, and the test mode is used for debugging only.
- Make sure the trigger mode is opened before setting the polling function.
- After the polling function is 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.

Single Mode

Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to **Image Setting** → **Polling Mode**, and select **Single** as **Polling Mode**.
3. Select one parameter (e.g. **Param1**) from **Polling Param**.

Note

Up to 8 sets of parameter can be selected from **Polling Param**.

4. Set parameters related to the polling like **Polling Exposure Time**, **Polling Gain**, **Polling Gamma**, etc. according to actual demands.

Table 9-3 Parameters of Single Mode Polling

Parameter	Description
Polling Exposure Time	It sets the exposure time of polling, and the unit is μs.
Polling Gain	It set the polling gain, and the unit is dB.
Polling Gamma	It sets the polling Gamma value. ● If the value is between 0 and 1, the image brightness increases and dark area becomes brighter. ● If the value is between 1 and 4, the image brightness decreases and dark area becomes darker.
Polling Light Enable	(Optional) After enabling this parameter, the light source will turn on during polling.
Polling Focus Enable	(Optional) After enabling this parameter, you can set polling focus position and temperature.
PollingFocusPos	It sets the polling focus position.
PollingFocusTemp	It displays the device temperature during settings of polling focus position. The device temperature can affect the focusing accuracy of the lens. You can view the current temperature of the device for compensation of the focusing control step.

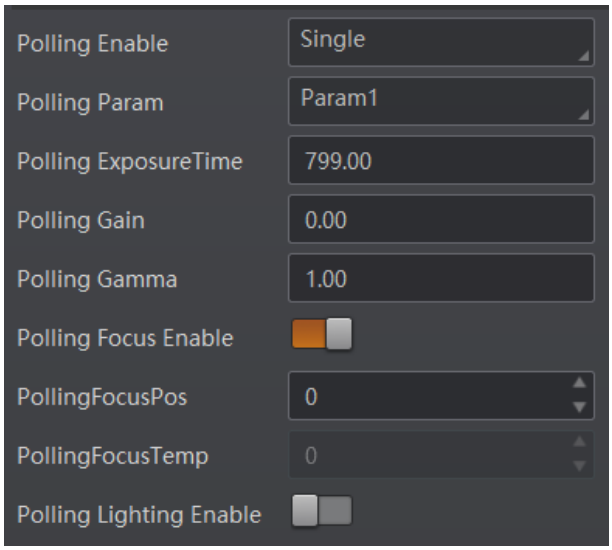


Figure 9-3 Single Mode

Multiple Mode

Note

- In multiple mode, the device supports trigger parameters like software trigger, external trigger, etc., and does not support stopping polling via the external trigger.
- 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 Mode**, and select **Multiple** as **Polling Enable**.
3. Set **Polling Time** and **Polling Period** according to actual demands.
   - **Polling Time** is used to determine whether the polling is finished or not, and it ranges from 100 to 2147482.
   - **Polling Period** is whole period from Param1 to Param8, and it ranges from 1 to 5000.
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 parameters related to the polling like **Polling Exposure Time**, **Polling Gain**, **Polling Gamma**, etc. according to actual demands.

Table 9-4 Parameters of Multiple Mode Polling

Parameter	Description
Polling Exposure Time	It sets the exposure time of polling, and the unit is μs.
Polling Gain	It set the polling gain, and the unit is dB.
Polling Gamma	It sets the polling Gamma value. ● If the value is between 0 and 1, the image brightness increases and dark area becomes brighter. ● If the value is between 1 and 4, the image brightness decreases and dark area becomes darker.
Polling Light Enable	(Optional) After enabling this parameter, the light source will turn on during polling.
Polling Focus Enable	(Optional) After enabling this parameter, you can set polling focus position and temperature.
PollingFocusPos	It sets the polling focus position.
PollingFocusTemp	It displays the device temperature during settings of polling focus position. The device temperature can affect the focusing accuracy of the lens. You can view the current temperature of the device for

Parameter	Description
	compensation of the focusing control step.

6. Repeat Step 5 to set other parameters from **Polling Param**.
7. Go to **Stop Trigger Control** → **Polling Stop Trigger Enable**, and enable this parameter.

- **Polling Stop Code Num Mode**: It sets the method for calculating the number of codes when configuring polling stop. In **Single Polling Frame** mode, the calculation is based on the frame. In **Whole Polling Period** mode, the calculation is based on the whole period of the polling.
- **Polling Stop Code Num**: When the device reads the configured number of valid codes, the polling will stop.

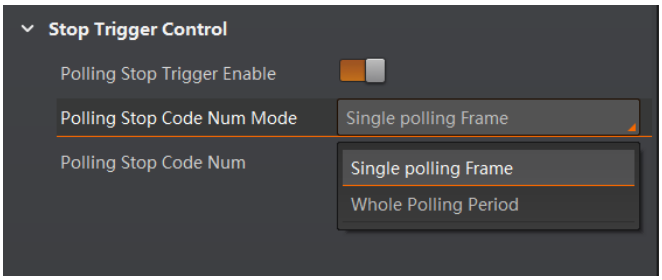


Figure 9-4 Polling Stop Trigger Enable

8. (Optional) View **Polling Status** and **Best Polling Group Idx.**

- **Polling Status**: It displays the current polling status. 0 stands for polling ended, and 1 stands for polling started.
- **Best Polling Group Idx**: It 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.

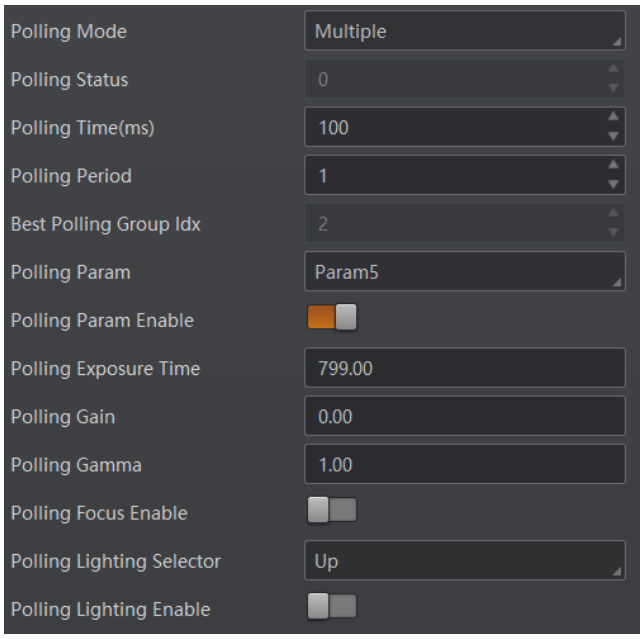


Figure 9-5 Multiple Mode

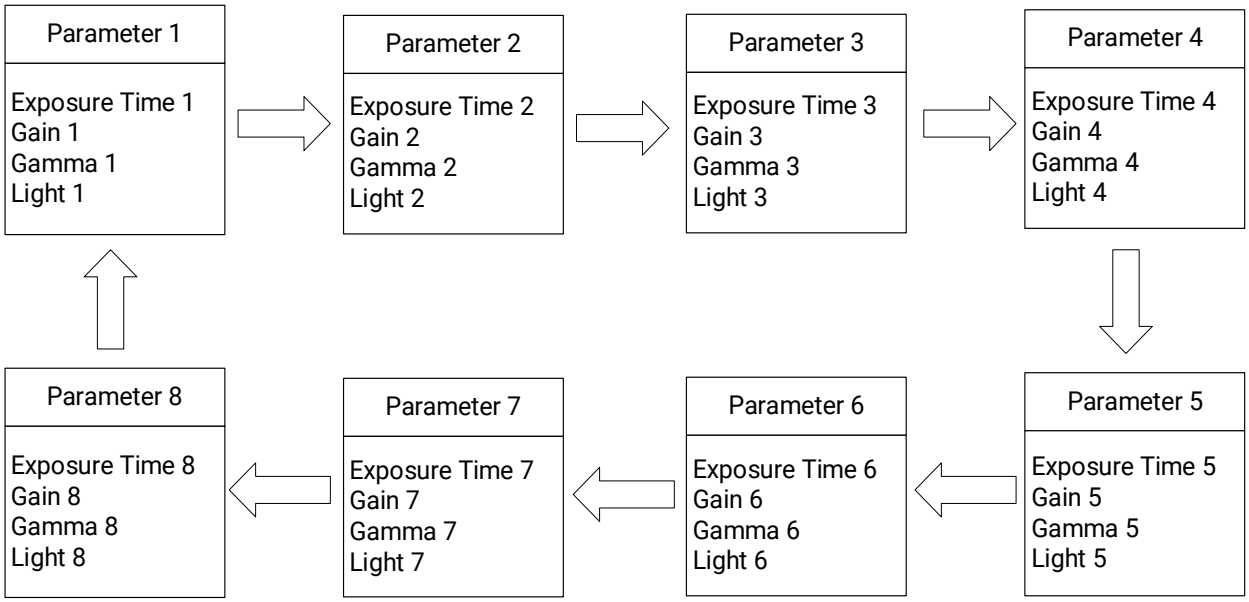


Figure 9-6 Polling Diagram

9.2.3 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 **AimingLight Enable** according to actual demands.

Note

After this function is enabled, the device's aiming light will turn on immediately upon power-up, regardless of the streaming mode, running mode, or trigger mode.

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.

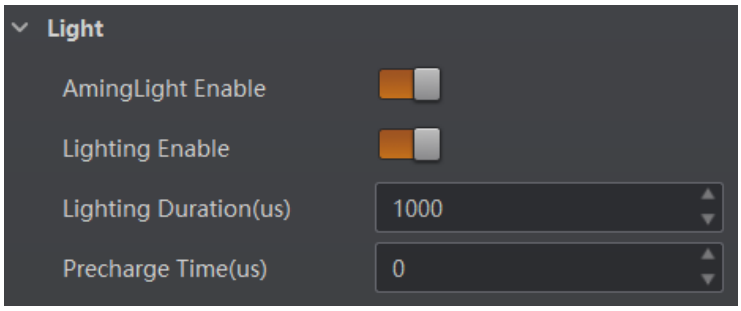


Figure 9-7 Set Light Source

9.2.4 Set Smart Tune

The smart tune function allows you to adjust the device's focus position, exposure, gain, etc. by one-key operation, and supports self-adaptive adjustment.
The smart tune function has two methods to be realized, including smart tune by pressing tune button and smart tune via the client software.

Note
The smart tune function is supported by some device models and firmware versions.

Smart Tune by Pressing Tune Button

Note
- The parameters of the smart tune may differ by device models and firmware versions.
- During the process of smart tune, the focus parameters and self-adaptive parameters will be adjusted in turn.

Steps
1. Go to **Image Settings**, click **All Features** on the right corner, and find **SmartTuneControl**.
2. Enable **Button Tune**, and disconnect the device from the client software.

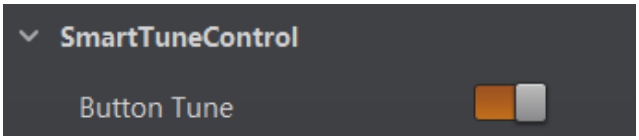


Figure 9-8 Button Tune

Note
Smart tune by pressing the tune button is not supported if the device is connected via the client software.

3. Hold the tune button for 3 seconds, and the device starts smart tune.
- During smart tune process, the status indicator flashes in green and red colors

alternatively.
- If smart tune succeeds, the status indicator is solid green lasting 3 seconds and then restores.
- If smart tune fails, the status indicator is solid red lasting 3 seconds and then restores.

4. (Optional) Hold the button for 3 seconds again during smart tune process, and the smart tune will be cancelled.

Smart Tune via Client Software

Apart from pressing tune button to realize smart tune, you can also configure parameters via the client software to realize it.

Before You Start

Make sure that the device is not in trigger mode, and its running mode is test.

Steps

1. Go to **Image Settings**, click **All Features** on the right corner, and find **SmartTuneControl**.

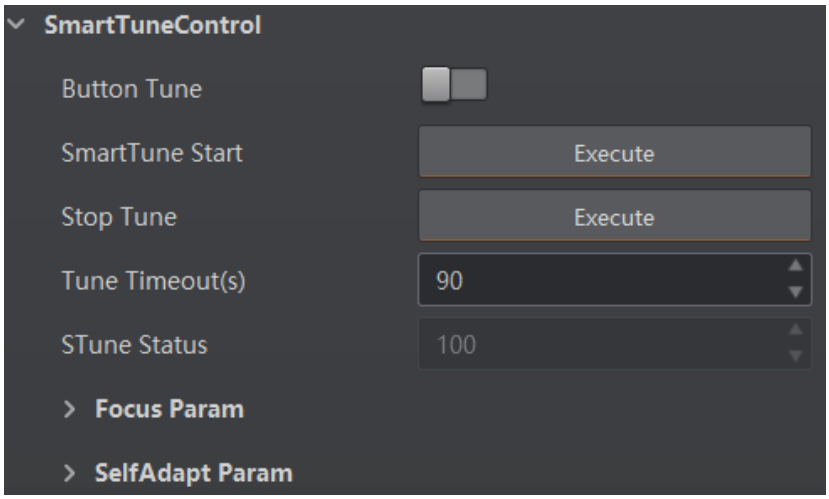


Figure 9-9 Smart Tune Control

2. (Optional) Set **Tune Timeout.** If the self-adaptive adjustment exceeds configured value, and it will stop automatically and show the timeout information.
3. Click **Execute** in **Smart Tune Start** to let the device start smart tune, and a window of smart tune will be displayed for you to view the effect.

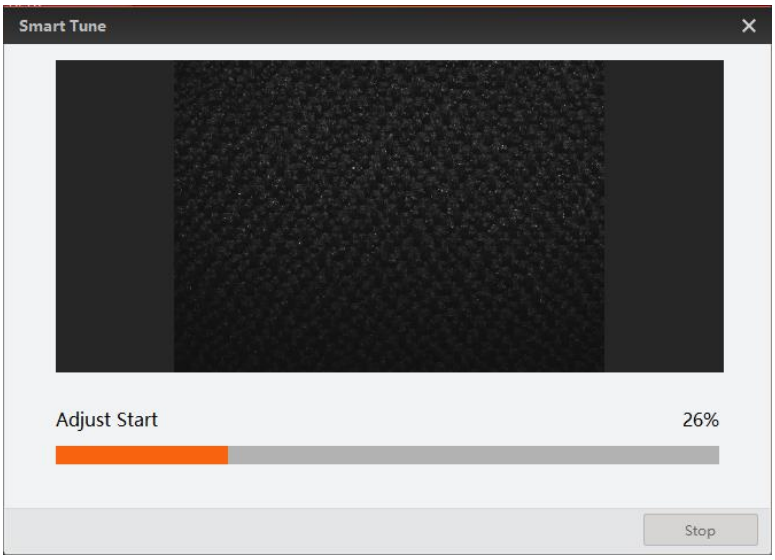


Figure 9-10 Smart Tune Start

4. (Optional) View smart tune process via **Smart Tune Status**.
5. (Optional) Click **Execute** in **Stop Tune** to stop smart tune process.
6. (Optional) You can set focus-related parameters and self-adaption parameters via **Focus Param** and **SelfAdapt Param**.

Note

Refer to section *Set Focus* and section *Set Self-Adaptive Adjustment* for details.

9.2.5 Set Focus

The device supports the focus function according to the code position in the field of view. Currently, three types of focus are supported, including global auto focus, global manual focus, and ROI focus.

Note

- Make sure that the device's running mode is test before performing focus, and switch to the normal running mode after the focus is completed.
- The focus function may differ by device models.

Global Auto Focus

The global auto focus allows you to adjust lens focus in a global field of view just by once.

Steps

1. Go to **Image Settings** → **SmartTuneControl** → **Focus Param** → **Focus Mode Selector**, and select **Whole Area Focus** as **Focus Mode Selector**.

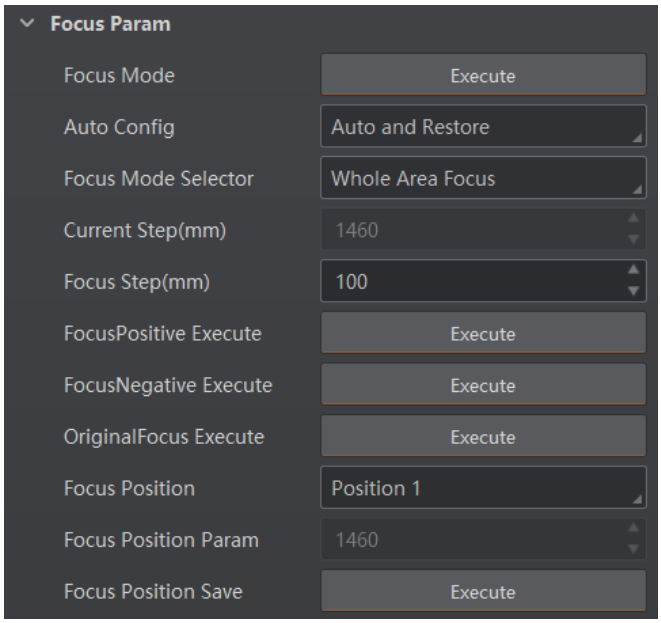


Figure 9-11 Global Auto Focus

2. Click in the live view window, and click it again to stop acquisition and make sure there is an image in the window.
3. Select the focus mode in **Auto Config**:

- **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. Click **Execute** in **Focus Mode**, and the device starts to adjust focus automatically.

Note

Focus-related parameters cannot be configured during auto focus process, and after the process, parameters can be configured again.

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) View **Focus Score** to know the score of the focus adjustment.

Global Manual Focus

The global manual focus requires manual focus according to the images displayed in the live view window.

Steps

1. Go to **Image Settings** → **Smart Tune Control** → **Focus Param** → **Focus Mode Selector**, and select **Whole Area Focus** as **Focus Mode Selector**.

2. Click in the live view window, and click it again to stop acquisition and make sure there is an image in the window.
3. Select **Focus Position** according to actual demands and **Focus Position Param**.
4. Set **Focus Step** according to actual demands.
5. Click **Execute** in **Focus Positive Execute** and **Focus Negative Execute** to adjust focus position.
6. (Optional) View **Focus Score** to know the score of the focus adjustment.
7. (Optional) Select the position parameter from **Focus Position**, and click **Execute** in **Focus Position Save** to save the focus position after adjusting focus.
8. (Optional) Click **Execute** in **Original Focus Execute** to let the focus back to its original position.

ROI Focus

The ROI focus allows you to adjust lens focus regarding the ROI area by drawing specific area.

Note

The ROI focus is applicable to the scenario where multiple codes with different depth of fields are existing.

Steps

1. Go to **Image Settings** → **Smart Tune Control** → **Focus Param** → **Focus Mode Selector**, and select **ROI Area Focus** as **Focus Mode Selector**.

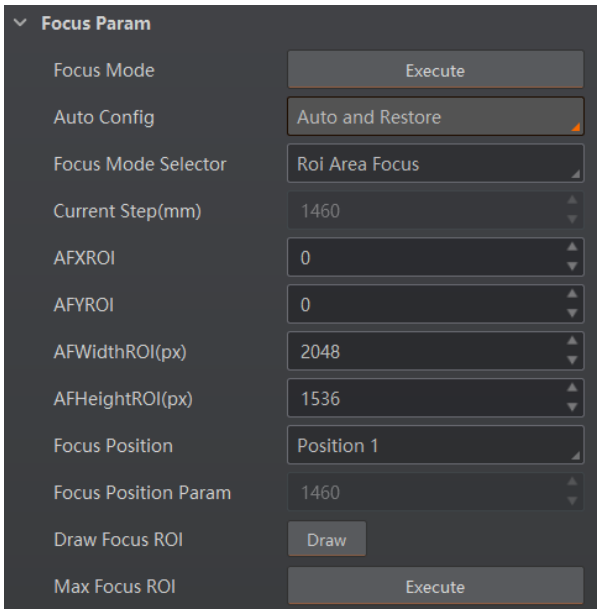


Figure 9-12 ROI Focus

2. Click in the live view window, and click it again to stop acquisition and make sure there is image in the window.

3. Click **Draw** in **Draw Focus ROI**, and draw ROI by dragging the mouse in live view window.

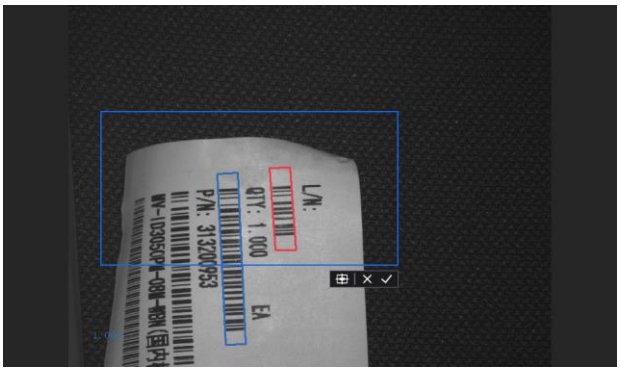


Figure 9-13 Draw Focus ROI

4. (Optional) Set the following parameters to adjust ROI size and position.
- **AF Offsex X**: It is X coordinate of the upper-left corner in ROI where executes auto focus.
- **AF Offsex Y**: It is Y coordinate of the upper-left corner in ROI where executes auto focus.
- **AF Width ROI**: It refers to the width in ROI where executes auto focus.
- **AF Height ROI**: It refers to the height in ROI where executes auto focus.

5. (Optional) Click **Execute** in **Max. Focus ROI** to have a global focus.
6. (Optional) Repeat step 3 if you want to set multiple ROIs.

9.2.6 Set Self-Adaptive Adjustment

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

Note

The function and parameters of self-adaptive adjustment may differ by device models.

Before You Start

Make sure you have connected the device to the client software and have stopped acquisition.

Steps

1. Go to **Image Settings** → **SmartTuneControl** → **SelfAdapt Adjust**, and unfold **Self Adapt Adjust**.
2. Select an adjustment mode.
- **High Quality**: If you select this mode, exposure will be adjusted in priority. The acquired picture will have a smaller gain and noise, which makes a higher picture quality. It is suitable for objects with a slow moving speed.
- **High Speed**: If you select this mode, gain will be adjusted in priority. There may be more noise on the picture. It is suitable for objects with a fast moving speed.

3. Select **Adjust Source** according to actual demands.

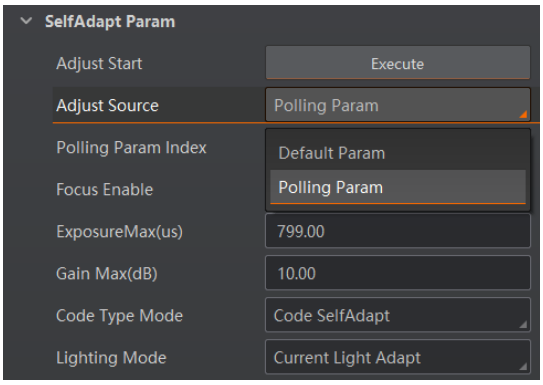


Figure 9-14 Select Adjust Source

- **Default Param**: It adjusts the default parameters.
- **Polling Param**: It adjusts parameters configured in polling. After **Polling Param** is selected as **Adjust Source**, you should select a polling parameter group from **Polling Param** and enable or disable **Focus Enable**.

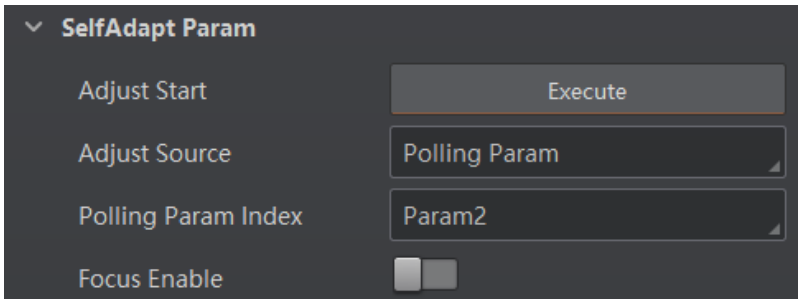


Figure 9-15 Polling Parameter

4. (Optional) Set light source parameters in **Lighting Mode**.
- **Light Adapt**: The client software will select the best one from all lighting options during the self-adaptive adjustment.
- **All Light Enable**: All light sources will be turned on during self-adaptive adjustment process.
- **All Light Disable**: All light sources will be turned off during self-adaptive adjustment process.

5. (Optional) Set self-adaptive code type in **Code Type Mode**.
- **Code SelfAdapt**: All code types added in field of view will be self-adaptive.
- **1D Code**: 1D code types added in field of view will be self-adaptive.
- **2D Code:** 2D code types added in field of view will be self-adaptive.
- **Stacked Code:** Stacked code types added in field of view will be self-adaptive.

6. (Optional) Set **Exposure Max** or **Gain Max** according to actual demands.
- **Exposure Max**: It sets the max. exposure in the high speed mode.
- **Gain Max**: It sets the max. gain in the high quality mode.

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 is completed, the client software displays the spent time and prompts adjustment succeeded, and the exposure and gain are the values configured in the self-adaptive adjustment. If the adjustment failed or is timeout, the client software prompts adjustment failure or timeout.

9.2.7 Set Mirror X

The device supports the mirror X functions.
Go to **Image Settings** → **Other Features** to set **Mirror X** according to actual demands. If the parameter is enabled, the image will be reversed in a horizontal way.

Note

The **Mirror X** is enabled by default, and it may differ by device models.

9.2.8 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

Specific parameters of this function may differ by device models.

Go to **Image Settings** → **Other Features**, and set **Test Pattern** according to actual demands.

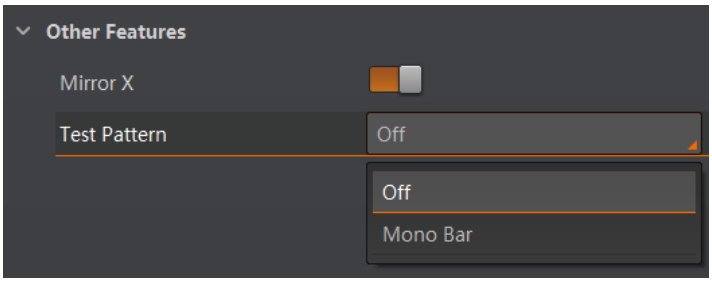


Figure 9-16 Set Test Pattern

9.3 Code Algorithm Settings

The code reader supports reading multiple types of 1D code, 2D code, and stacked codes, and you can add and set code parameters via the client software.

9.3.1 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**, you can select types of codes to be read, and set the **Number of 1D Code**, **Number of 2D Code**, or **Number of Stack Code** according to actual demands.

Note

- For different models of the device, the specific parameters may differ, and the actual device you purchased shall prevail.
- The number of selected symbologies and codes may affect the code recognition time. More symbologies or more codes selected may consume more time to recognize codes in the image. Please select code according to the actual demands.
- The code reader may output actual code quantity when the actual code quantity is less than the code quantity set in the client software.

9.3.2 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, multiple 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 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**, and find **Algorithm ROI**.
2. Click **Draw** in **Draw ROI** to draw the ROI in the live view window.

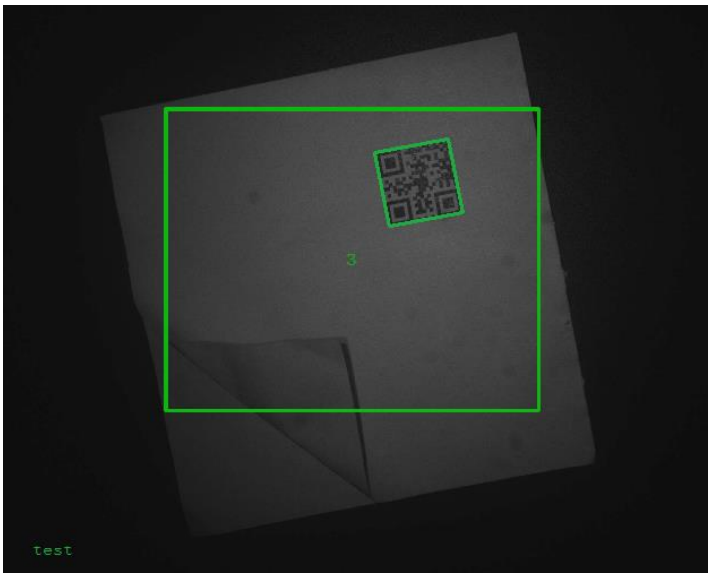


Figure 9-17 Draw ROI

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-related parameters according to the actual demands.
- **ROI Index**: It indicates different ROIs and ranges from 0 to 149 corresponds 1 to 150 ROIs.
- **AlgoRegionWidth**: It refers to the width in algorithm ROI.
- **AlgoRegionHeight**: It refers to the height in algorithm ROI.
- **AlgoRegionLeftX**: It refers to the X coordinate of the upper-left corner in algorithm ROI.
- **AlgoRegionLeftY**: It refers to the Y coordinate of the upper-left corner in algorithm ROI.

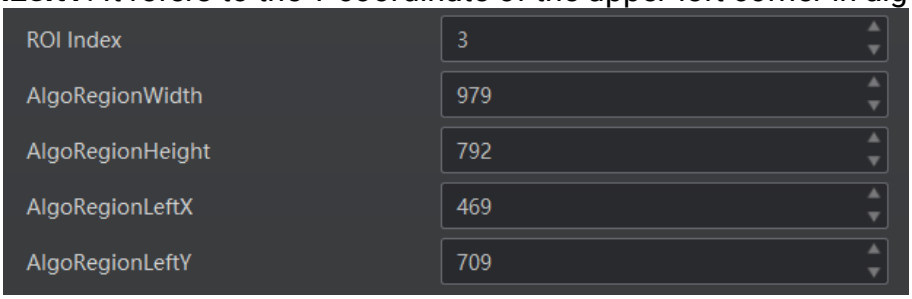


Figure 9-18 ROI Parameters

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.
7. (Optional) Right-click the ROI and click **Delete** to delete the selected ROI.
8. (Optional) After you enable the **ROI Link IO Enable** in **Feature Tree → Trigger and IO Control**, and when the code is not read in any ROI, the linked output device will output a message.

Draw ROI via Chessboard

Steps

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

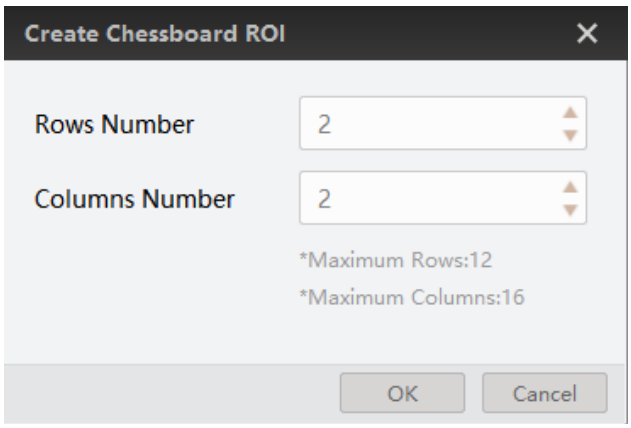


Figure 9-19 Create Chessboard ROI

3. (Optional) Click  to restore the ROI to full screen, and click  to clear all ROIs.
4. Click  after creating ROI, and the red frame becomes green as shown below.

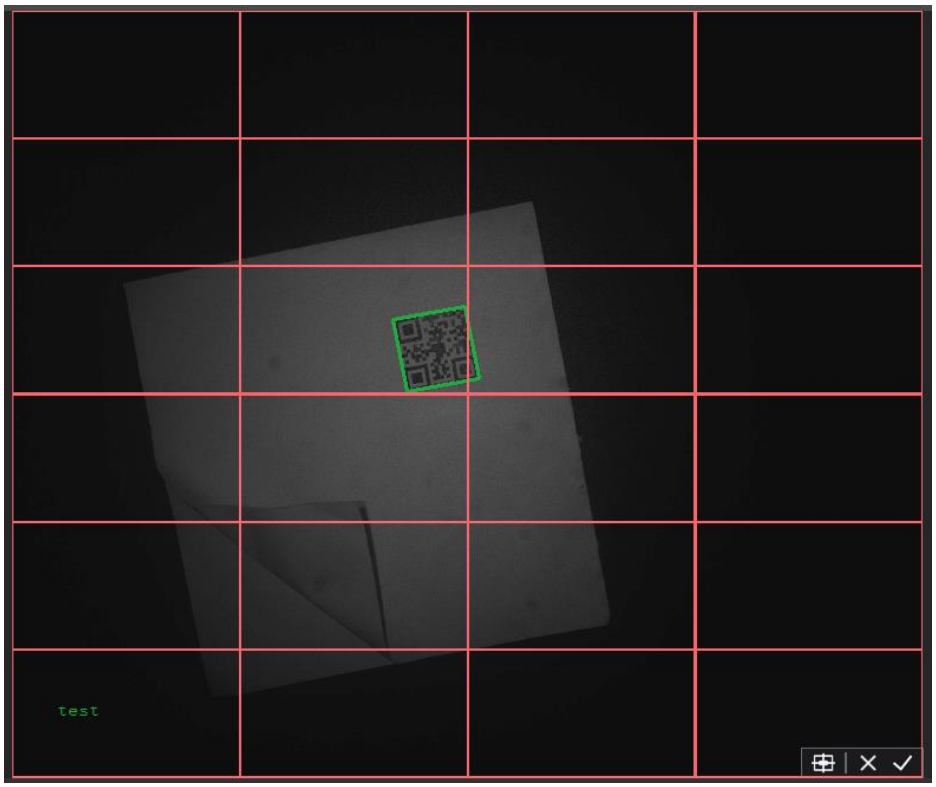


Figure 9-20 Draw ROI via Chessboard

5. Repeat other optional steps mentioned in drawing single group of ROI.

Note

- The figures above are for reference only. Refer to the actual conditions.
- When no ROIs are enabled, the current ROI defaults to full screen.
- When some ROIs are enabled, the disabled ROI is located at the top-left corner (0, 0) with a size of 128 × 128 pixels.

9.3.3 Set Algorithm Parameter

In **Algorithm Parameter**, select **1DCode** or **2DCode** as **Arithmetic Type**, and then you can set the related parameters.

Note

- You should have selected at least one type of 1D code or 2D code.
- For different models of the device, the specific parameters may differ, and the actual device you purchased shall prevail.

Set 1D Code

Waiting Time

Waiting time 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. When the value is set as 0, the actual running time of algorithm will prevail.

Code Color

It defines the readable code color. **WhiteCodeOnBlackWall** means that the client software can recognize the white code with black background. **BlackCodeOnWhiteWall** means that the client software can recognize the black code with white background. **Adaptive** means that the device can recognize both types of codes mentioned above. However, the reading time will be longer compared with the above two modes.

Code 39 Check

Enable this parameter if Code 39 uses the parity bit.

Note

You need to select **Code 39** in **Select Code**.

ITF 25 Check

Enable this parameter if ITF 25 uses the parity bit.

Note

You need to select **ITF 25** in **Select Code**.

Code Quality Enable

If it is enabled, the client software will judge the quality of 1D code and output overall grade. Currently, this parameter is only applicable to Code 39 and Code 128.

Code Score Enable

If it is enabled, the client software will evaluate the code reading environment for 1D code and output code score.

Accurate Timeout Enable

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

Set 2D Code

Waiting Time

Waiting time 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. When the value is set as 0, the actual running time of algorithm will prevail.

Algorithm Running Mode

It is used to be set the algorithm operating mode. It includes **HighSpeed**, **HighPerformance**, and **Balance**. **HighSpeed** focuses on recognition speed, and the algorithm can recognize the code rapidly, while **HighPerformance** 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. Three modes are available: **Adaptive**, **Mirror**, and **NonMirror**.

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.

Code Color

It defines the readable code color. **WhiteCodeOnBlackWall** means that the client software can recognize the white code with black background. **BlackCodeOnWhiteWall** means that the client software can recognize the black code with white background. Adaptive means that the device can recognize both types of codes mentioned above. However, the reading time will be longer compared with the above two modes.

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. The parameter is disabled by default.

Note

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

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

If it is enabled, the client software will judge the quality of 2D code and output overall grade. Currently, this parameter is only applicable to DM code and QR code.

Code Score Enable

If it is enabled, the client software will evaluate the code reading environment for 2D code and output code score.

Accurate Timeout Enable

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

9.3.4 Set Code Quality Evaluation

The code quality evaluation function judges the quality of codes and outputs overall grade. Currently, only DM code supports code quality evaluation.

Note

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

enable it manually.
- This function is also supported for multiple codes in the field of view.

Before You Start

Make sure that the device's operation mode is normal.

Steps

1. Go to **Algorithm Settings**, and select **2DCode** as **Arithmetic Type**.
2. Enable **2D Code Quality Enable**.
3. Set the ISO edition and verification edition.
   - **Iso Edition:** Select the rating standard from ISO 15415 and ISO 29158. ISO 15415 is suitable for continuous code; ISO 29158 is suitable for dot code.
   - **Verify Edition:** Set the rating mode as standard mode.
4. Select the evaluation criteria based on your actual demands. If enabled, the rating standard is used to evaluate the code quality.

Table 9-5 Code Quality Evaluation Standards

Parameter	Description
TDCRDecode	It evaluates whether the code recognition is successful or not.
TDCRSymbolContrast	It evaluates the difference between the max. brightness value and the min. brightness value of the code area.
TDCRModulation	It evaluates the degree of change in terms of brightness.
TDCRFixedPatternDamage	It evaluates the damage of code formats.
TDCRAxialNonuniformity	It evaluates the distortion degree of the code's vertical and horizontal sizes.
TDCRUnusedErrorCorrection	It evaluates the code for grid damage which might reduce the error correction capability of the code.
TDCRGridNonuniformity	It evaluates the distortion of the grids in the code.
TDCRPrintGrowth	It evaluates whether the size of each unit of the code is uniform

5. Set the evaluation value for A/B/C/D grade according to actual demands.
   - If the actual code reading value is greater than the grade A evaluation value, the evaluation standard is grade A.
   - If the actual code reading value is between grade A and grade B, the evaluation standard is grade B.
   - If the actual code reading value is between grade B and grade C, the evaluation standard is grade C.
   - If the actual code reading value is between grade C and grade D, the evaluation

standard is grade D.
- If the actual code reading value is lower than the grade D evaluation value, the evaluation standard is grade F.
- The client software selects the worst grade among all the evaluation standards as the grade judgment result of the code. The A grade means that the code quality is best, and F grade means that code quality is worst.

9.3.5 Set Code Score

The code score function evaluates the code-reading environment for codes and outputs code score.

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. Go to **Algorithm Settings**, and enable **Code Score Enable**.

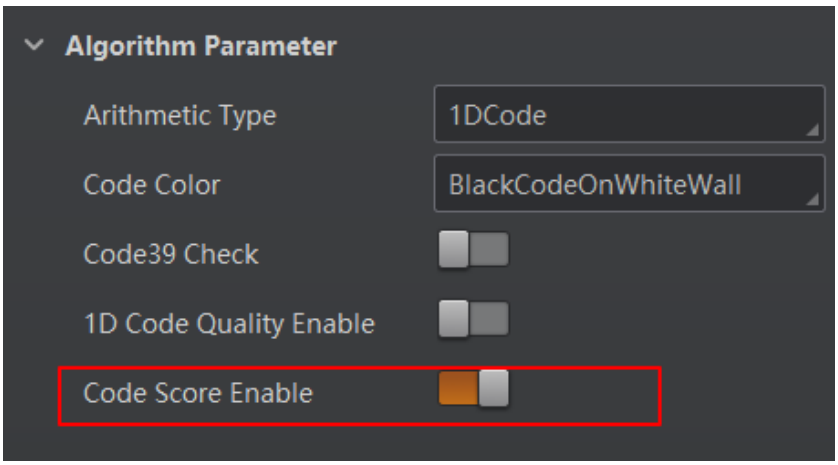


Figure 9-21 Enable Code Score Enable

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

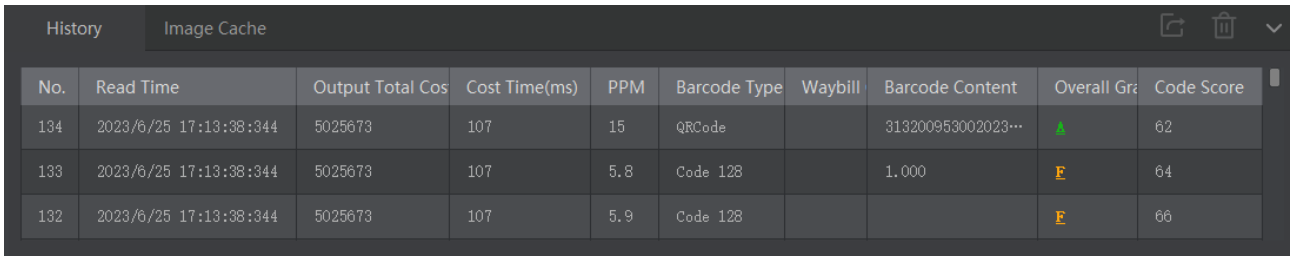


Figure 9-22 Code Score

3. (Optional) If the code score is low, go to **Image Settings**, and adjust parameters such as exposure time, gain, Gamma, and light source.

Note

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

9.4 Input/Output Settings

9.4.1 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

- 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.

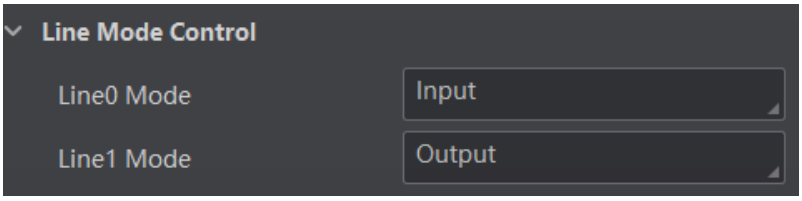


Figure 9-23 Set Line Mode

9.4.2 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.

Note

- The specific function may differ by device models. 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 set it.

Steps

1. Click **I/O Control Settings** on the navigation bar to enter the I/O Control Settings panel.
2. Click **Input** → **Trigger Mode**, and select **On** as **Trigger Mode**.
3. Select a source type from the drop-down list of **Trigger Source**.

Note

- The trigger source includes Software, LineIn 0/1/2/3, Counter 0, TCP Start, UDP Start, Serial Start, USB Start, and Self Trigger.
- The device with USB interface supports two trigger sources (USB Start and Software) only, and the device with network interface supports all trigger sources apart from USB Start.
- For specific trigger source, refer to the actual device you got.

4. Set **Trigger Delay** according to the needs. The trigger delay function allows the device to add a delay between the receipt of trigger signal and the moment the trigger becomes active. It is 0 by default and the unit is μs. The sequence diagram of trigger delay is shown below.

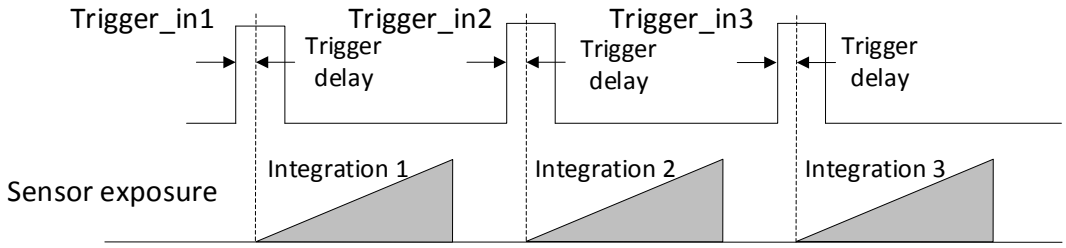


Figure 9-24 Sequence Diagram of Trigger Delay

5. Configure trigger-related parameters according to the selected trigger source. Refer to the section below.

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.

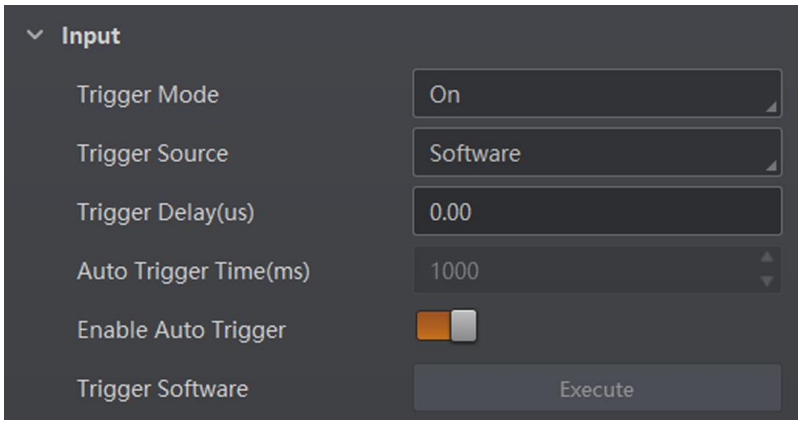


Figure 9-25 Set and Execute Software Trigger Mode

Set and Execute Hardware Trigger Mode

Steps

1. Go to **I/O Control Settings** → **Input** → **Trigger Mode**.
2. Select **On** as **Trigger Mode**.
3. Select the specific line as **Trigger Source** according to the actual demands.
4. Set **Debounce Time** and **Trigger Activation** according to the actual demands.

Note

- When selecting **Rising Edge** or **Falling Edge** as **Trigger Activation**, you can set **Trigger Delay**.
- When selecting **Level High** or **Level Low** as **Trigger Activation**, you can set **Start Delay Time** and **End Delay Time**.

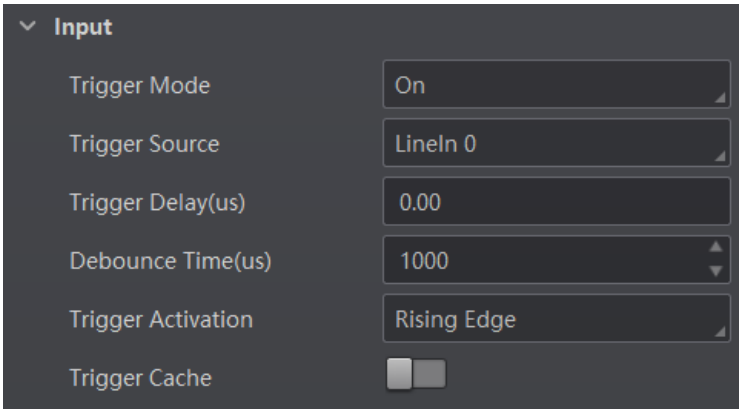


Figure 9-26 Set and Execute Hardware Trigger Mode

Note

Trigger debounce: The trigger debounce function allows the device to filter out unwanted short external trigger signal that is input to the device. The sequence diagram of trigger delay is shown below.

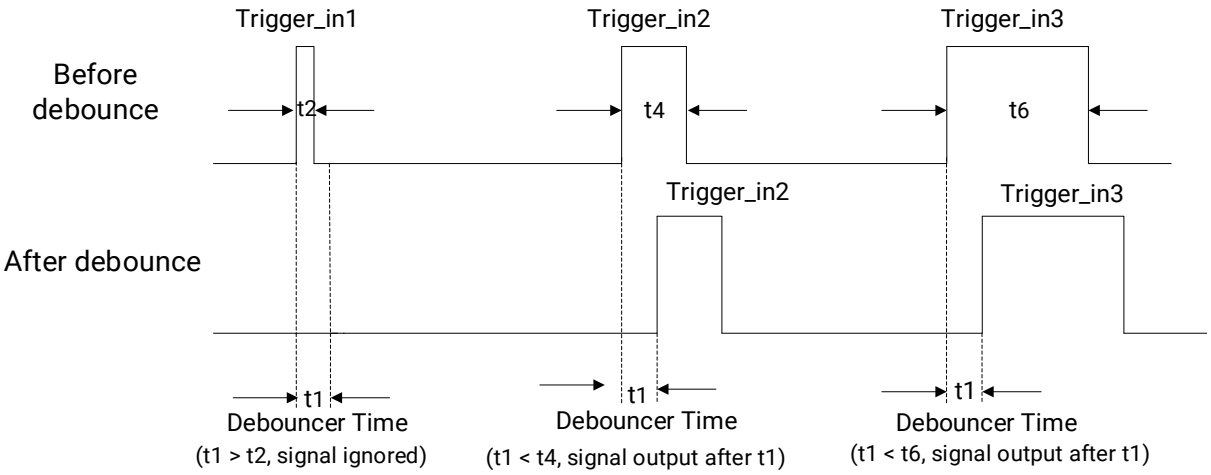


Figure 9-27 Sequence Diagram of Trigger Debounce

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. Go to **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 **Trigger Activation**

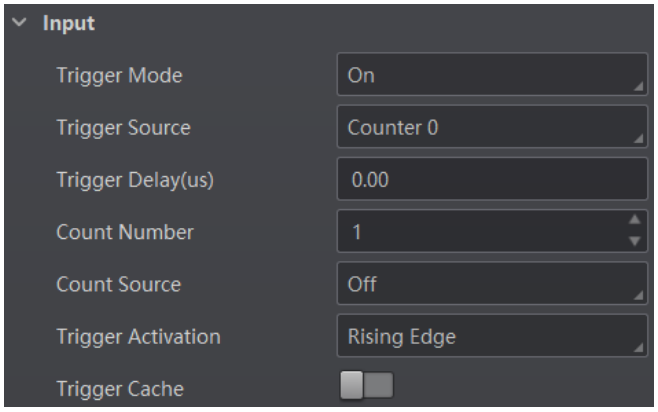


Figure 9-28 Set and Execute Counter Trigger Mode

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 output.

Steps

1. Go to **I/O Control Settings** → **Input** → **Trigger Mode**.
2. Select **On** as **Trigger Mode**.
3. Select **TCP Start** as **Trigger Source**.
4. Set following parameters according to actual demands.

- **TCP Trigger Port**: It sets the port No. of the server.

Note

- The port No. configured here should differ from that in the TCP server port in the communication settings. Otherwise, parameter configuration will fail.
- This function shares the same port No. with the trigger stopping via TCP, and the settings for both will take effect.

- **TCP Trigger Text Format**: When receiving the specified trigger text, the server will output a trigger signal. You can select the text format from **Str** or **Hex**.
  - If **Str** is selected, enter the text in string format in the box next to **TCP Start Trigger Text**.
  - If **Hex** is selected, enter the text in hexadecimal format in the box below **TCP Trigger Start String**. If needed, you can click ⊞ to open the ASCII Cross Reference Table and click a table cell to add the corresponding content to the text box.
- **TCP Start Trigger Text**: It sets the trigger text of TCP Start, and it is **Start** by default.

Note

You can also configure the string text for sending a TCP handshake request and receiving a TCP handshake response via **Trigger and IO Control** module on the feature tree.

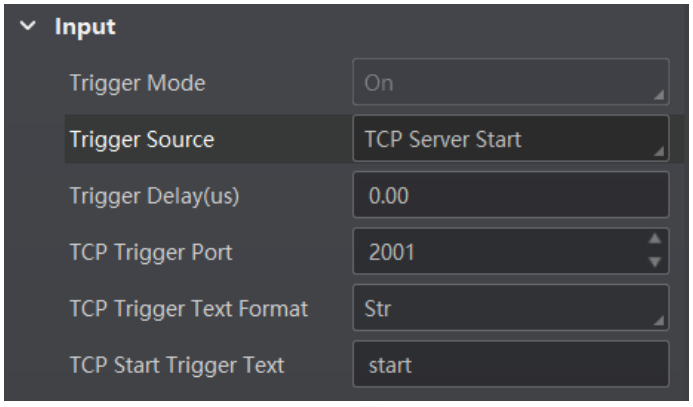


Figure 9-29 Set and Execute TCP Trigger Mode

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.

Steps

1. Go to **I/O Control Settings** → **Input** → **Trigger Mode**.
2. Select **On** as **Trigger Mode**.
3. Select **UDP Start** as **Trigger Source**.
4. Set following parameters according to actual demands.

- **UDP Trigger Port**: It sets the port No. of the server.
- **UDP Trigger Text Format**: When receiving the specified trigger text, the server will output a trigger signal. You can select the text format from **Str** or **Hex**.
    - If **Str** is selected, enter the text in string format in the box next to **UDP Start Trigger Text**.
    - If **Hex** is selected, enter the text in hexadecimal format in the box below **UDP Trigger Start String**. If needed, you can click ⊞ to open the ASCII Cross Reference Table and click a table cell to add the corresponding content to the text box.
- **UDP Start Trigger Text**: It sets the trigger text of UDP Start, and it is **Start** by default.

Note

You can also configure the string text for sending a UDP handshake request and receiving a UDP handshake response via **Trigger and IO Control** module on the feature tree.

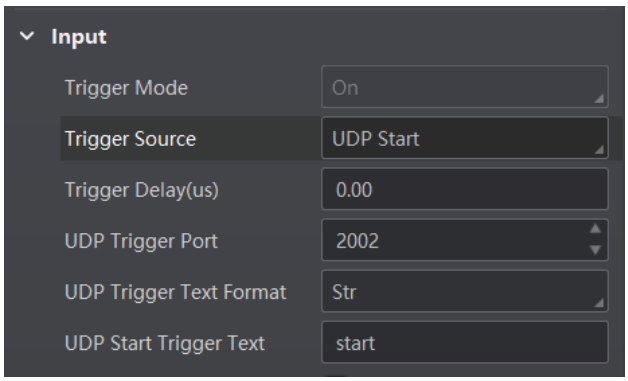


Figure 9-30 Set and Execute UDP Trigger Mode

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 output.

Steps

1. Go to **I/O Control Settings** → **Input** → **Trigger Mode**.
2. Select **On** as **Trigger Mode**.
3. Select **Serial Start** as **Trigger Source**.

4. Set **Serial Baudrate**, **Serial Data Bits**, **Serial Parity**, and **Serial Stop Bits**.
5. Set following parameters according to actual demands.

- **Serial Trigger Text Format**: When receiving the specified trigger text, the server will output a trigger signal. You can select the text format from **Str** or **Hex**.
  - If **Str** is selected, enter the text in string format in the box next to **Serial Start Trigger Text**.
  - If **Hex** is selected, enter the text in hexadecimal format in the box below **Serial Trigger Start String**. If needed, you can click ⊞ to open the ASCII Cross Reference Table and click a table cell to add the corresponding content to the text box.
- **Serial Start Trigger Text**: It sets the trigger text of Serial Start, and it is **Start** by default.

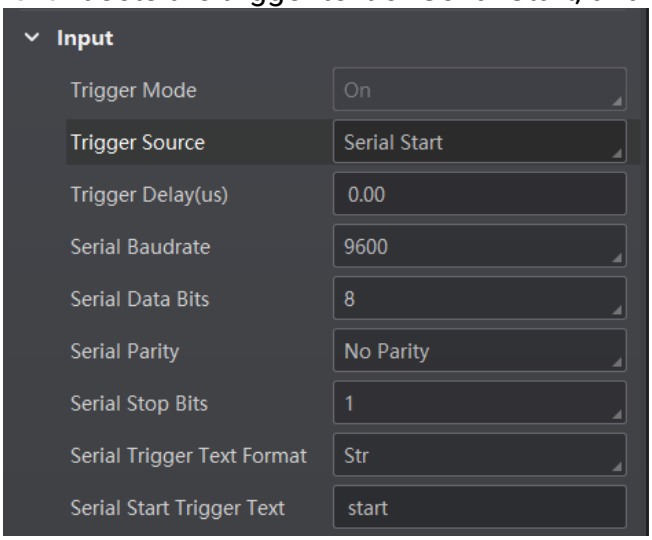


Figure 9-31 Set and Execute Serial Port Trigger Mode

Set and Execute USB Trigger Mode

Steps

1. Go to **I/O Control Settings** → **Input** → **Trigger Mode**.
2. Select **On** as **Trigger Mode**.
3. Select **USB Start** as **Trigger Source**.
4. Set **USB Baudrate**, **USB Data Bits**, **USB Parity**, **USB Stop Bits**, and **USB Start Trigger Text** according to actual demands.

Set and Execute Self Trigger Mode

Self trigger allows you to trigger the device according to the trigger period you configured.

Steps

1. Click **I/O Control Settings** → **Input** → **Trigger Mode**.
2. Select **On** as **Trigger Mode**.
3. Select **Self Trigger** as **Trigger Source**.

4. Set **Self Trigger Period** and **Self Trigger Count** according to the actual demands.

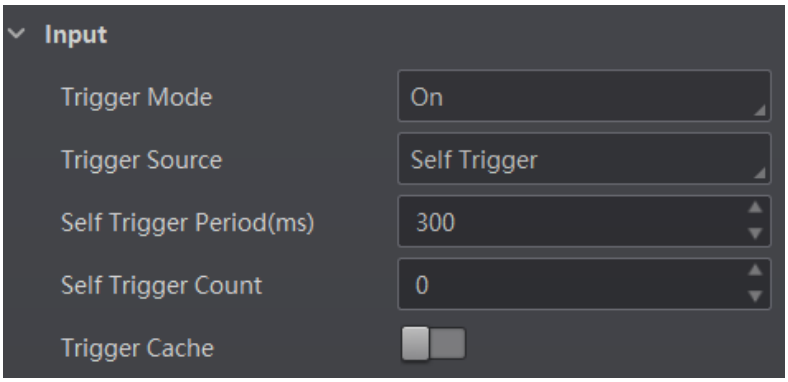


Figure 9-32 Set and Execute Self Trigger Mode

Note

- If the self-trigger count is set to 0, and it means that it can be triggered indefinitely until the execution of self-trigger stops.
- The self-trigger time shall be set to be greater than the reciprocal of the actual frame rate.

Set and Execute Brightness Tigger

When the brightness of the field of view changes, the code reader is triggered to acquire images and output code information automatically. The code reader monitors the change of image brightness value in real time and starts code reading when the change exceeds the configured sensitivity threshold.

Steps

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

9.4.3 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 device with USB interface supports stopping trigger via USB only, and the device with network interface supports all stop trigger methods apart from USB method.
- For specific trigger stopping 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.

Steps

1. Go to **I/O Control Settings** → **Stop Trigger**.
2. Enable **TCP Stop Trigger Enable**.
3. Set following parameters according to actual demands.

- **TCP Trigger Port**: It is 2001 by default.

Note

- The port No. configured here should differ from that in the TCP server port in the communication settings. Otherwise, parameter configuration will fail.
- This function shares the same port No. with the TCP Trigger Mode, and the settings for both will take effect.

- **TCP End Trigger Format**: You can select the text format from the drop-down list, including **Str** and **Hex**.
  - If **Str** is selected, enter the text in string format in the box next to **TCP Stop Trigger Text**.
  - If **Hex** is selected, enter the text in hexadecimal format in the box below **TCP Trigger End String**. If needed, you can click + to open the ASCII Cross Reference Table and click a table cell to add the corresponding content to the text box.
- **TCP Stop Trigger Text**: It sets the stop trigger text, and it is **stop** by default.

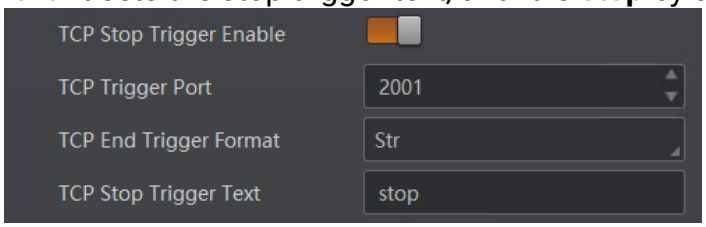


Figure 9-33 Stop Trigger via TCP

Stop Trigger via UDP

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

Steps

1. Go to **I/O Control Settings** → **Stop Trigger**.
2. Enable **UDP Stop Trigger Enable**.
3. Set following parameters according to actual demands.

- **UDP Trigger Port**: It is 2002 by default.
- **UDP End Trigger Format**: You can select the text format from the drop-down list, including **Str** and **Hex**.
  - If **Str** is selected, enter the text in string format in the box next to **UDP Stop Trigger Text**.
  - If **Hex** is selected, enter the text in hexadecimal format in the box below **UDP Trigger**

End String. If needed, you can click ⊞ to open the ASCII Cross Reference Table and click a table cell to add the corresponding content to the text box.

- **UDP Stop Trigger Text**: It sets the stop trigger text, and it is **stop** by default.

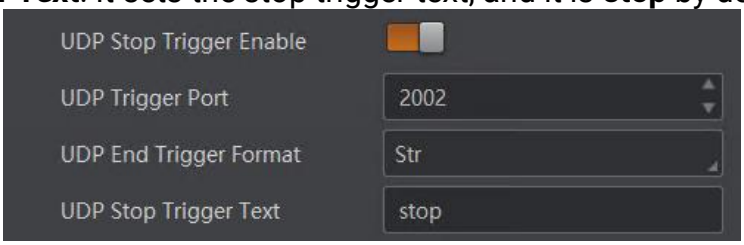


Figure 9-34 Stop Trigger via UDP

Stop Trigger via IO

Stopping trigger via IO allows you to select hardware or software trigger source to stop the device from acquiring images.

Note

The output signal may differ by the device models.

Steps

1. Go to **I/O Control Settings** → **Stop Trigger**.
2. Enable **IO Stop Trigger Enable**.
3. Select sources from **LineIn 0/1/2/3** and **SoftwareTriggerEnd** as **IO Stop Trigger Selector**.
4. (Optional) Set trigger polarity (rising edge and falling edge) if **LineIn 0/1/2/3** is selected as **IO Stop Trigger Selector**. If the trigger source of the input signal is the same as that of the trigger stopping via I/O, there is no need to select.

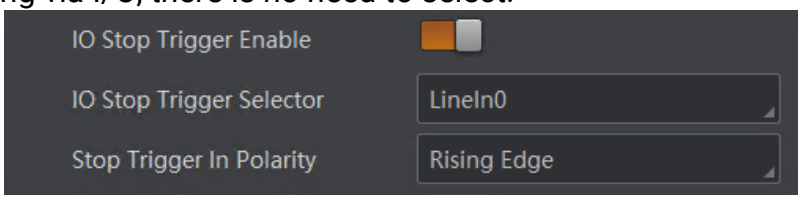


Figure 9-35 Stop Trigger via I/O

5. (Optional) Click **Execute** in **Software Stop Trigger** to stop trigger if **Software Trigger End** is selected as **IO Stop Trigger Selector**.

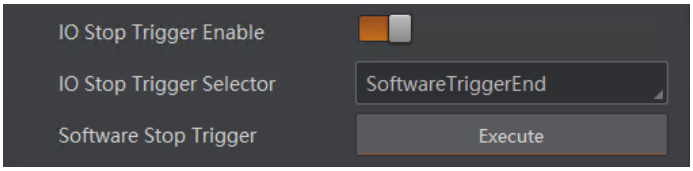


Figure 9-36 Software Trigger End

Stop Trigger via Serial Port

When the specified serial port receives the specified string text, the trigger will be stopped.

Steps

1. Go to **I/O Control Settings** → **Stop Trigger**.
2. Enable **Serial Stop Trigger Enable**.
3. Set following parameters according to actual demands.

- **Serial End Trigger Format**: When receiving the specified trigger text, the server will output a trigger signal. You can select the text format from **Str** or **Hex**.
  - If **Str** is selected, enter the text in string format in the box next to **Serial Stop Trigger Text**.
  - If **Hex** is selected, enter the text in hexadecimal format in the box below **Serial Trigger Stop String**. If needed, you can click + to open the ASCII Cross Reference Table and click a table cell to add the corresponding content to the text box.

Note

Hex is supported only when the data bits of the serial port is 8.

- **Serial Stop Trigger Text**: It sets the trigger text of serial port stop, and it is **stop** by default.
- **Serial Baudrate**: It sets the baud rate of the serial port, and it is 9600 by default.
- **Serial Data Bits**: It sets the data bits of the serial port, and it is 8 by default.
- **Serial Parity**: It sets the parity of the serial port, and it is **No Parity** by default.
- **Serial Stop Bits**: It sets the stop bits of the serial port, and it is 1 by default.

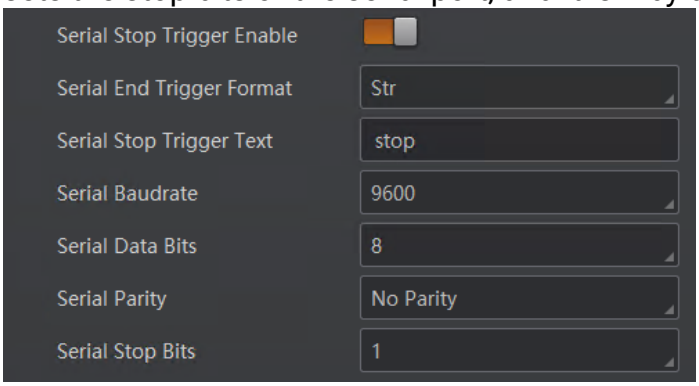


Figure 9-37 Stop Trigger via Serial Port

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**, and set **USB Stop Trigger Text**, **USB Baudrate**, **USB Data Bits**, **USB Parity**, and **USB Stop Bits** according

to actual demands.

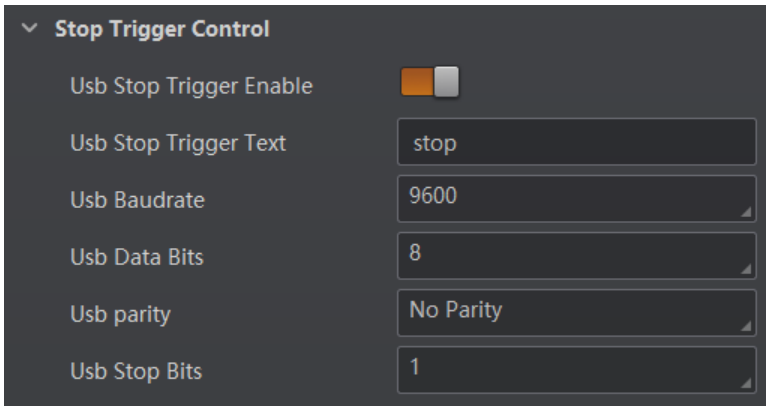


Figure 9-38 Stop Trigger via USB

Note

The parameter settings in trigger stopping via USB are similar to those in trigger stopping via serial port. Refer to section ***Stop Trigger via Serial Port*** for details.

Stop Trigger via Timeout Duration

Note

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

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

Note

The range of **Maximum Output Limited Time** is between 0 ms and 10000 ms.

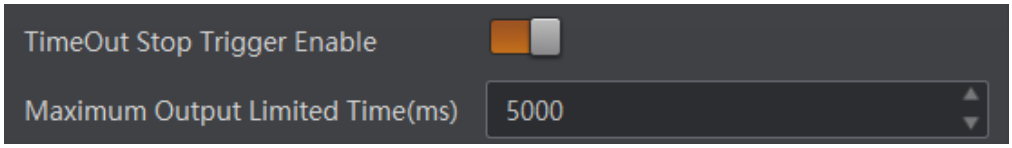


Figure 9-39 Stop Trigger via Timeout Duration

Stop Trigger via Code Number

Note

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

This function means that the code quantity output 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.

Note

- If the number of outputted codes is less than the value configured for **CodeNum Stop Trigger Min**, the device will output codes continuously.
- If the number of outputted codes is greater than the value configured for **CodeNum Stop Trigger Max**, the device will stop outputting codes.
- If the number of outputted codes is between the values configured for **CodeNum Stop Trigger Min** and **CodeNum Stop Trigger Max**, the device will read and output codes according to trigger signals.
- If **CodeNum Stop Trigger Min** is the same as the **CodeNum Stop Trigger Max**, the device will stop outputting codes when the number of outputted codes reaches the configured number.

Figure 9-40 Stop Trigger via Code Number

9.4.4 Signal Output Settings

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

The specific output signals may differ by device models.

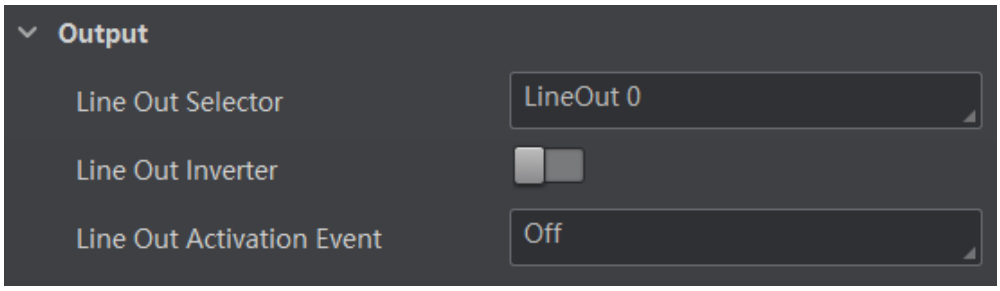


Figure 9-41 Select Output Signal

Set Event Source

Note

The specific event sources may differ by device models and firmware versions.

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**, **ReadSuccess**, **CompareSuccess**, **CompareFail**, and **CommandControlIO**.

Note

- **Off** refers to no event source.
- You need to set different parameters when selecting various event sources.

- **NoCodeRead**: If no code read by the device, the output signal will be triggered.
- **ReadSuccess**: If the code is read by the device, the output signal will be triggered.
- **CompareSuccess**: If data comparison is successful, the output signal will be triggered.
- **CompareFail**: If data comparison is failed, the output signal will be triggered.
- **CommandControlIO**: It is controlled by the communication strings.

Select No Code Read

If you select **NoCodeRead** as **Line Out Activation Event**, and 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.

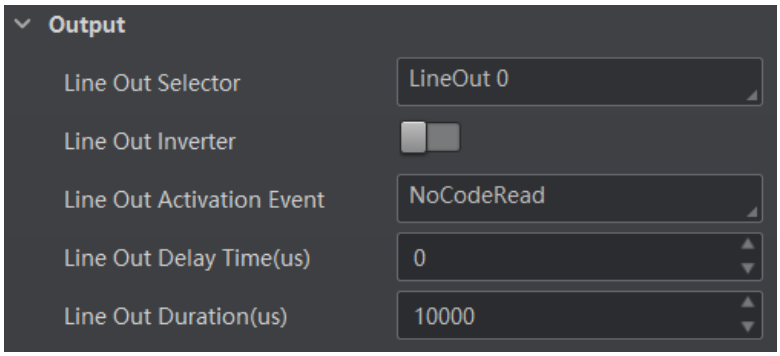


Figure 9-42 Select No Code Read

Select Read Success

If you select **ReadSuccess** as **Line Out Activation Event**, and 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.

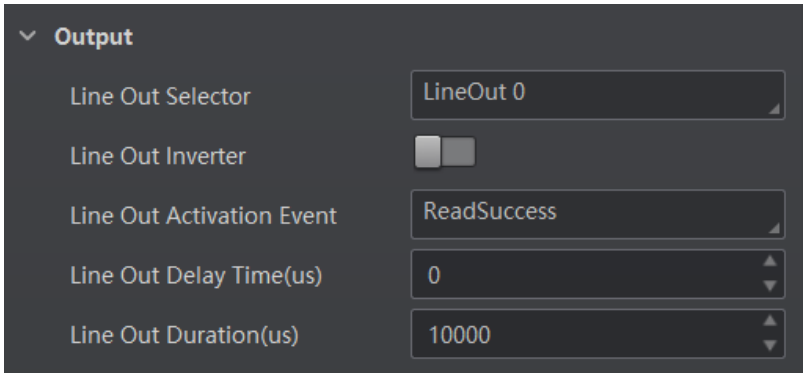


Figure 9-43 Select Read Success

Select Compare Success

If you select **Compare Success** as **Line Out Activation Event**, and 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.

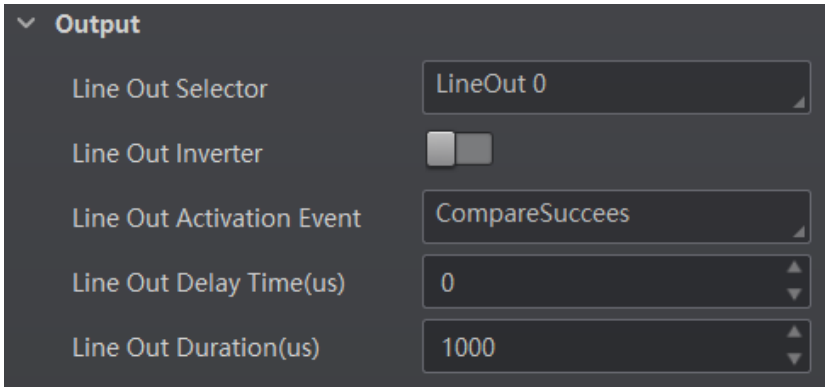


Figure 9-44 Select Compare Success

Select Compare Fail

If you select **Compare Fail** as **Line Out Activation Event**, and 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.

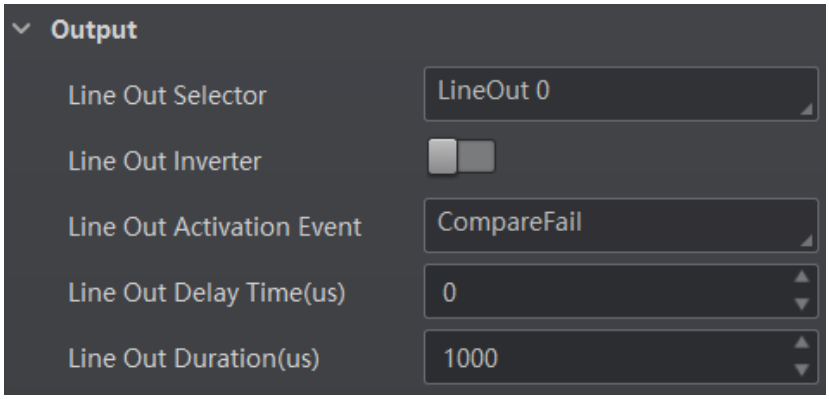


Figure 9-45 Select Compare Fail

Select Command Control IO

If you select **CommandControlIO** as **Line Out Activation Event**, and you do not need to set any parameters.

- **Control Start Str**: It sets the start string of command control.
- **Control Stop Str**: It sets the stop string of command control.
- **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.

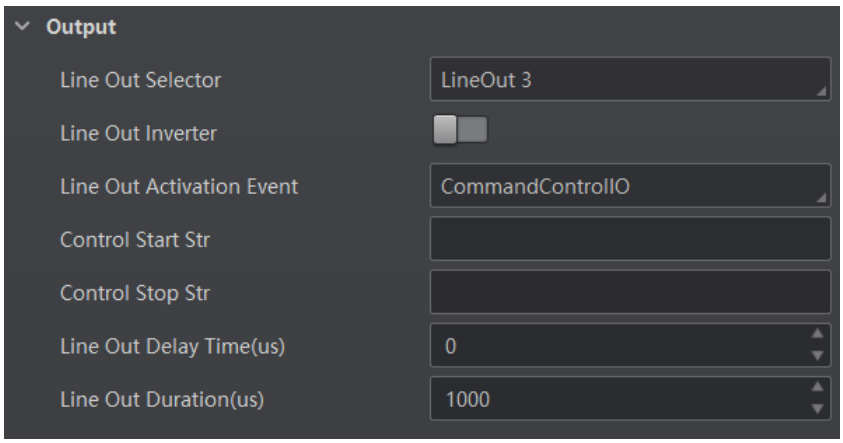


Figure 9-46 Select Command Control IO

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.

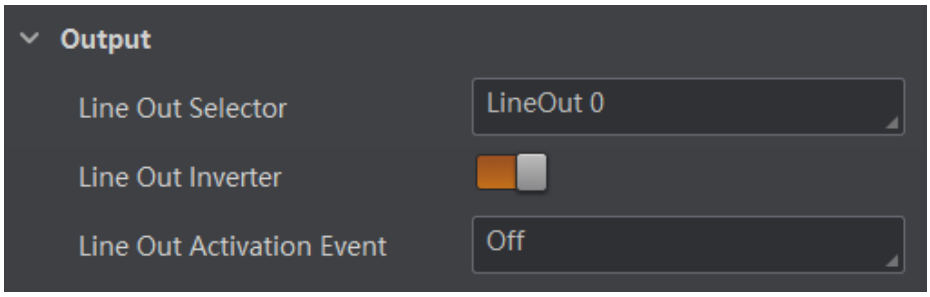


Figure 9-47 Enable Line Out Inverter

9.4.5 Set Buzzer

Note

- Only ID2000EM series devices support buzzer function.
- Make sure that the device is in 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 **Buzzer Enable** is enabled, the buzzer beeps three times when the device is powered on, beeps twice when the device reads configuration codes successfully, and beeps once when the device reads codes successfully.

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

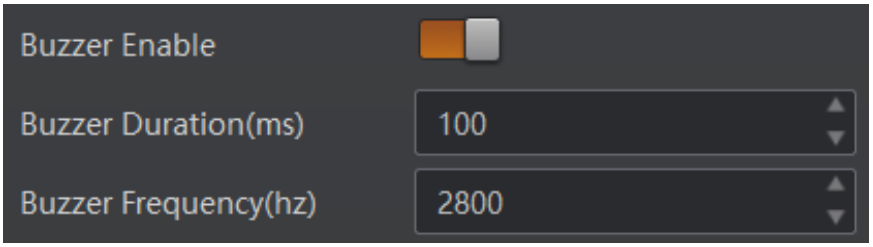


Figure 9-48 Set Buzzer

9.5 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.

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

Note

- The supported communication protocols may differ by device models.
- The device with USB interface supports **SmartSDK** and **USB** only, and device with network interface supports all communication protocols apart from **USB**.
- The specific parameters of communication protocols may differ by device models.
- If you need communication command for reference, you can open the Communication Commands document by clicking **Help** → **Communication Matrix** on the top menu bar.

9.5.1 Set SmartSDK

If you select **SmartSDK** as the communication protocol, you can configure the following parameters:

Table 9-6 SmartSDK Communication Protocol

Parameter	Description
SmartSDK Protocol	If enabled, the device will output data via SmarkSDK.
Encode JPEG Flag	The device will compress images in JPG format after enabling it.
Quantity of JPG	It sets the image compression quality, and it ranges from 50 to 99.

9.5.2 Set TCP Client

If you select **TCP Client** as the communication protocol, you can configure the following parameters:

Table 9-7 TCP Client Communication Protocol

Parameter	Description
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. You can configure **Output Result Buffer Number** to determine the number of the images that the

Parameter	Description
	device will cache.
TCP Protocol	If enabled, the device will output data via the TCP server.
TCP Dst Addr	Enter the IP address of the server that receives data output by the code reader.
TCP Dst Port	Enter the port No. of the server that receives data output by the code reader.

9.5.3 Set Serial

If you select **Serial** as the communication protocol, you can configure the following parameters:

Table 9-8 Serial Communication Protocol

Parameter	Description
Serial Protocol	If enabled, the code reader will output data via serial port.
Serial Baudrate	The baud rate of the serial port of the PC that receives data.
Serial Data Bits	Data bits of the serial port of the PC that receives data. **Note** The hexadecimal trigger is supported only when **Serial Data Bits** is 8.
Serial Parity	Parity bits of the serial port of the PC that receives data.
Serial Stop Bits	Stop bits of the serial port of the PC that receives data.

9.5.4 Set FTP

If you select **FTP** as the communication protocol, you can configure the following parameters:

Table 9-9 FTP Communication Protocol

Parameter	Description
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. You can configure **Output Result Buffer Number** to determine the number of the images that the device will cache.
FTP Protocol	If enabled, the code reader will output data via FTP server.
FTP Host Addr	IP address of the FTP host.

Parameter	Description
FTP Host Port	Port No. of the FTP host.
FTP User Name	User name of the FTP.
FTP User PWD	Password of the FTP.

9.5.5 Set TCP Server

If you select **TCP Server** as the communication protocol, you can configure the following parameters:

Table 9-10 TCP Server Communication Protocol

Parameter	Description
TCP Server Enable	If enabled, the code reader will output data via TCP server.
TCP Server Port	The port No. of the TCP server that receives data outputted by code reader.

Note

The port No. configured here should differ from that in the TCP trigger of trigger source or in the trigger stopping via TCP. Otherwise, parameter configuration will fail.

9.5.6 Set Profinet

If you select **Profinet** as the communication protocol, you can configure the following parameters:

Table 9-11 Profinet Communication Protocol

Parameter	Description
Profinet Enable	If enabled, the device will output data via Profinet protocol.
Profinet Device Name	Enter the name of the code reader, which is used for code reader recognition in Profinet protocol communication.

9.5.7 Set MELSEC/SLMP

If you select **Melsec/SLMP** as the communication protocol, you can configure the following parameters:

Table 9-12 MELSEC/SLMP Communication Protocol

Parameter	Description
MELSEC Protocol Enable	If enabled, the code reader will output data via MELSEC protocol.
MELSEC Destination IP Address	IP address of the Programmable Logic Controller (PLC) connected to the code reader.
MELSEC Destination Port	Port No. of the MELSEC protocol channel on the PLC.
MELSEC Data Base Address	The address of the data base of the PLC for receiving the data outputted by the code reader. The default value is 0.
MELSEC State Base Address	The address of the state base of the PLC, which is used for sending trigger signal to the code reader and receiving trigger result and code reading results from the code reader. The default value is 0.
MELSEC Network Number	MELSEC protocol network No. to communicate with.
MELSEC PLC Number	No. of the PLC to be connected to the code reader.
MELSEC Module I/O Number	No. of the target module.
MELSEC Module Station Number	No. of the target module station.
MELSEC Timeout	Maximum waiting time for PLC response.
MELSEC Protocol Enable	If enabled, the code reader will output data via MELSEC protocol.

9.5.8 Set Ethernet/IP

If you select **EthernetIp** as the communication protocol, you can configure the following parameters:

Table 9-13 Ethernet/IP Communication Protocol

Parameter	Description
Ethernet/IP Enable	If enabled, the code reader will output data via Ethernet/IP protocol.

9.5.9 Set ModBus

If you select **Modbus** as the communication protocol, you can configure the following

parameters:

Table 9-14 ModBus Communication Protocol

Parameter	Description
ModBus Enable	If enabled, the code reader will output data via ModBus protocol.
ModBus Mode	Select a mode from **Server** and **Client**.
ModBus Control Space	The value is "holding_register" by default and not editable.
ModBus Control Offset	Offset of the control address. The default value is 0.
ModBus Control Size (Word)	The value is 1 by default.
ModBus Status Space	It sets status space and it is “holding_register” by default.
ModBus Status Offset	It sets status offset and it is 1 by default.
ModBus Status Size (Word)	It is 1 by default.
ModBus Result Space	It set result space and it is “holding_register” by default.
ModBus Result Offset	It is 2 by default.
ModBus Result Size (Word)	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 result timeout of the ModBus protocol.

9.5.10 UDP

If you select **UDP** as the communication protocol, you can configure the following parameters:

Table 9-15 UDP Communication Protocol

Parameter	Description
UDP Protocol Enable	If enabled, the code reader will output data via User Datagram Protocol (UDP).
UDP Dst IP	The IP address of the PC receiving the output data.
UDP Dst Port	The port of the PC receiving the output data.

9.5.11 Fins

If you select **Fins** as the communication protocol, you can configure the following

parameters:

Table 9-16 Fins Communication Protocol

Parameter	Description
Fins Enable	If enabled, the code reader will output data via TCP/UDP FIN.
Fins Communication Mode	Select UDP or TCP as the communication mode.
Fins Server IP	It sets the server IP of Fins.
Fins Server Port	The local port of Fins. Default is 9600.
Fins Control Poll Interval (ms)	It sets how often read data.
Fins Data Format	Select 16 bit or 32 bit as the data format.
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.

9.5.12 USB

If you select **USB** as the communication protocol, you can configure the following parameters:

Table 9-17 USB Communication Protocol

Parameter	Description
USB Enable	If enabled, the code reader will output data via USB.
USB Output	It sets the USB output mode, including CDC and HID.

Parameter	Description
USB Baudrate	It is 9600 by default.
USB Data Bits	It is 8 by default.
USB Parity	It is **No Parity** by default.
USB Stop Bits	It is 1 by default.

9.6 Data Processing Settings

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

Note

The specific parameters may differ by device models and firmware versions.

9.6.1 Set Filter Rule

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

Normal Filter Mode

If the device's running mode is normal, trigger mode is on, filter mode is normal, you can set following parameters according to actual demands:

- **Instant Output Mode Enable:** If it is enabled, the device will output barcode data immediately once a code is read. If not enabled, the barcode data will be outputted after the device trigger process ends.
- **Min. Output Time(ms):** Define the minimum time duration (unit: ms) for data output. The duration starts from trigger time. Note: The parameter is only available when the running mode is set to Normal mode and the trigger mode is enabled.
- **Min. Code Length:** If the length of a barcode is shorter (in terms of the number of characters) than the configured value, the device will NOT parse the barcode.
  For example, if you set the value to 6, the device will not parse the barcodes which contain fewer than 6 characters.

  Note

  The valid value of the parameter is from 1 to 256.

- **Max. Code Length:** If the length of a barcode is longer (in terms of the number of characters) than the configured value, the device will NOT parse the barcode.
  For example, if you set the value to 9, the device will not parse the barcodes which contain more than 9 characters.

Note

The valid value of the parameter is from 1 to 256.

- **Numeral Filter:** If it is enabled, the device will only parse and read the numeral contents of the barcodes, and the non-numeral contents will be filtered out.
- **CodeLen Max Num**: It refers to the max. length of the code for output.
- **Code Offset Num:** Define the offset for the start character of the barcode data.
  For example, if you set the value to 3, the code reader will output data starting from the third character of the barcode data. The first and second characters will NOT be outputted.
- **Begin with Specific Character for Result:** If it is enabled, the device will only read the barcodes which begin with a specific character string.
- **Begins with**: Enter the character string.
- **UPCA Fill Zero**: If it is enabled, when the content of the UPCA code is less than 13 digits, zero will be added at the beginning of the code. It is available only when the running mode is Normal, and the UPCA code is enabled.
- **Include Specific Character in Barcode:** If it is enabled, the device will only read the barcodes which include a specific character string.
- **Character**: Enter the character string.
- **Exclude Specific Character in Barcode:** If it is enabled, the device will only read the barcodes without a specific character string.
- **Character**: Enter the character string.
- **Regular Expression Filter Enable:** If it is enabled, the device will only read the barcodes which contain the configured character string(s).
- **Read Times Threshold:** If the reading results of a barcode is same for the configured times, the barcode will be regarded as valid and its data will be outputted. Or the barcode will be regarded as invalid and its data will not be outputted.
- **De-duplication Enable**: If it is enabled, the repeated code information will be filtered within specific trigger times. You can set trigger times in **De-duplication Windows Size**, and its default value is 1.
- **De-duplication By ROI**: If it is enabled, the device will filter information based on drawn ROIs.
- **Cut Mode**: **Simple Cut** or **Range Cut** can be selected.
  - **Simple Cut**: Set start/end offset of the code via **Code Start Offset Num** and **Code End Offset Num**. It will cut the specific length of code contents from starting/ending, and the remaining part will be outputted.
  - Range Cut: Cut the code via the character expressions. For example, the code content is 123456789, and the output will be performed based on the following expressions:
    Character expression (5) will output 5;
    Character expression (1-4) will output 1234;
    Character expression (1-4,6-9) will output 12346789;
    Character expression (1-4,8-) will output 123489;
    Character expression (1-) will output 123456789.

Note

- The parameters, such as **Instant Output Mode Enable**, **Min. Output Time**, **CodeLen Max Num**, **Code Offset Num**, **De-duplication Enable**, **De-duplication Windows Size**, **De-duplication By ROI**, **and Cute Mode**, are only available when the running mode is set to Normal mode and the trigger mode is enabled.
- When **De-duplication Enable** is disabled, no filtering will be performed.

Regular Expression Filter Mode

The device supports filtering codes via the regular expression.

Steps

1. Select **Regular Expression** as the **Filter Mode**, and click **Set** in **Regular Expression Filter** to enter regular expression filter settings window.
2. Import local files or add customized filter rules to set the regular expression.

- Import local files: Click **Import** to import local .xml files, and click **OK** to finish.

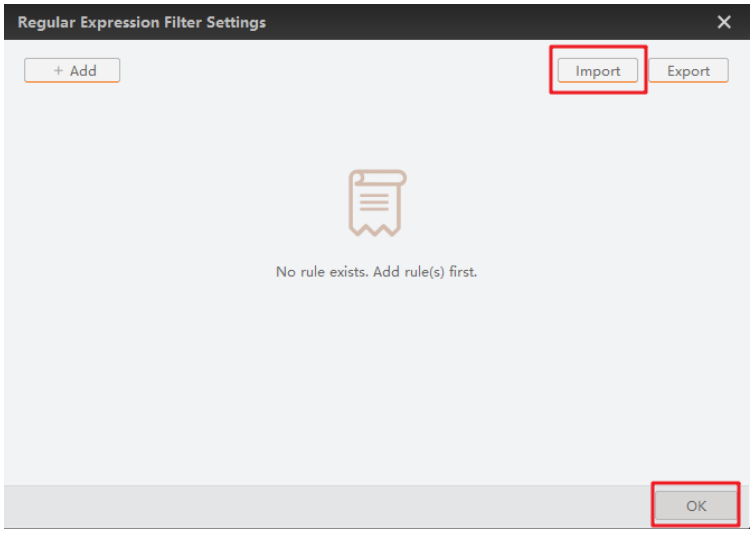


Figure 9-49 Regular Expression Filter Settings

- Add customized filter rule: Click **Add** and set related parameters in the popped-up window, and click **OK** after configuring parameters.

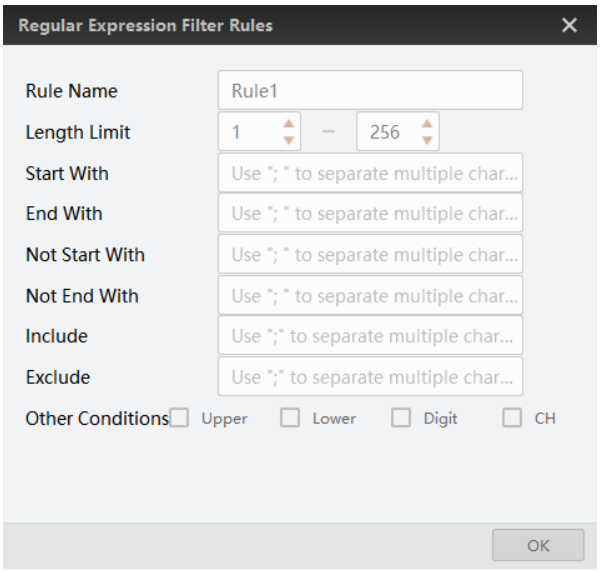


Figure 9-50 Customized Regular Expression Filter Rules

Table 9-18 Filter Rule Parameters

Parameter	Description
Rule Name	The default rule name is Rule 1, and you can edit it according to actual demands.
Length Limit	It sets the length range of the code, and its upper limit is 256.
Start With	It sets the specific start with code. You can use semicolon to separate if there are multiple characters. **Note** If multiple characters are used, code meeting one of these characters is valid.
End With	It sets the specific end with code. You can use semicolon to separate if there are multiple characters. **Note** If multiple characters are used, code meeting one of these characters is valid.
Not Start With	It excludes the specific start with code. You can use semicolon to separate if there are multiple characters. **Note** If multiple characters are used, code meeting one of these characters is valid.
Not End With	It excludes the specific end with code. You can use semicolon to separate if there are multiple characters.

Parameter	Description
	Note If multiple characters are used, code meeting one of these characters is valid.
Included	It sets the code with specific content. You can use semicolon to separate if there are multiple characters. **Note** If multiple characters are used, code meeting all these characters is valid.
Excluded	It sets the code without specific content. You can use semicolon to separate if there are multiple characters. **Note** If multiple characters are used, code meeting all these characters is valid.
Other Conditions	You can select uppercase, lowercase, digit or Chinese.

3. After setting filter rule, enter the code in **Code Check** to check if the filter rule is successful.

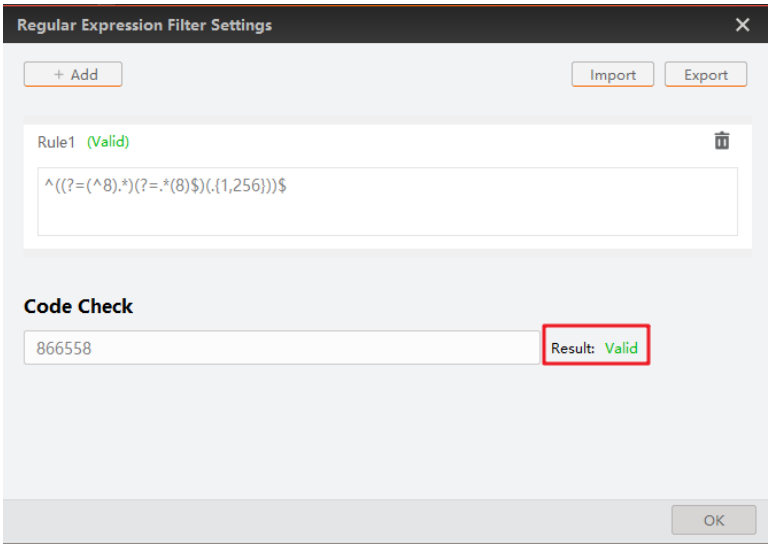


Figure 9-51 Code Check

Note

If the filter rule you configured is correct, the result is valid. Otherwise, it is invalid.

4. (Optional) Click to delete unwanted filter rules.
5. (Optional) Click **Export** to export configured filter rules to local PC.

Note

The filter rule parameters of the regular expression may differ by device models and firmware versions.

9.6.2 Data Processing Settings

You can configure the contents contained in the output barcode information.

Note

- The actual parameters displayed may vary with different communication protocols. For details about communication settings, refer to section ***Communication Settings***.
- The device with USB interface supports **SmartSDK** and **USB** only, and device with network interface supports all communication protocols apart from **USB**.
- The specific parameters and parameter order may differ by the device's running mode, trigger mode, device models and firmware versions.

SmartSDK

- **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.
- **Mirror Text Enable**: You can customize mirror characters in the data processing. The mirror characters can be defined through the mirror text parameters, while non-mirror characters defined through the non-mirror text parameters.
- **L-Side Angle Enable**: You can set the acceptable angle range and output text of the L-side angle of the DM code through the following parameters.

Note

This parameter can be used only when the running mode is Normal and DM code is enabled.

- 1/2/3/4 Area Start: It refers to the angle start position of the 1/2/3/4 area.
- 1/2/3/4 Area End: It refers to the angle end position of the 1/2/3/4 area.
- 1/2/3/4 Area Text: It refers to the output text in the 1/2/3/4 area.
- Text out of Area: It refers to the output text out of the 1/2/3/4 area.

FTP

When the communication protocol is FTP, set the following parameters of data processing:

- **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**: Enable to allow data re-transmission. Specify the limit of re-transmission attempts in **Output Retrans Number**.
- **FTP Transmission Conditions**: Set the condition to upload the data outputted by the device to FTP server.
  - **All**: Always upload the data.
  - **ReadBarcode**: Upload the data only when the barcode is read by the device.
  - **NoReadBarcode**: Upload the data only when no barcode is read by the device.
- **FTP Transmission Result Contain**: Select contents to upload to the FTP server.
  - **JustResult**: Only upload the content of the barcode.
  - **JustPicture**: Only upload the barcode image.
  - **ResultAndPicture**: Upload both the content of the barcode and the barcode image.
- **One By One Enable**: If it is enabled, the device will send one piece of code information each time in accordance with the specified interval. You can set the interval via **One By One Interval** and the default value 100 ms.
- **Local Save Picture Mode**: It includes **Off**, **NoRead**, and **Insufficient Code**. You can select **NoRead** to let the device save images when no code is read.
- **Local Picture Type**: Specify the type of pictures saved locally. You can select **JPEG** or **BMP**.
- **FTP Picture Name Format**: Click  to select one or multiple items to be contained in the picture name. The selected items will be displayed in the frame. You can also enter more contents directly in the frame.
- **FTP Time Format**: Select a format type from the drop-down list for the time stamp contained in the file name.

Note

Take YYYYMMDD_HHMMSSFFF as an example, (from the left to the right) YYYY represents year, MM month, DD date, HH hour, MM minute, SS second, FFF millisecond.

Other Communication Protocols

When the communication protocol is TCP Client, Serial, TCP Server, Profinet, MELSEC/SLMP, EthernetIp, ModBus, UDP, FINS, or USB, set the following parameters of data processing.

Note

Here we use "***" to represent the specific protocol name.

- **ROI Output Noread Enable**: Enable this to set the default output content if no code is read during transmission. Edit the output text in **Output NoRead Text**.
- **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.
- **One By One Enable**: If it is enabled, the device will send one piece of code information each time in accordance with the specified interval. You can set the interval via **One By**

One Interval and the default value 100 ms.

Note

This parameter cannot be used when the communication protocols are SmartSDK and FTP.

- *** **Output Format**: Click **Edit** to select one or multiple items to be contained in the picture name and click **Save**. The selected items will be displayed in the frame below. You can also enter more contents directly in the frame.

Table 9-19 Output Format Identifier

No.	Data	Identifier	No.	Data	Identifier
1	Code Content	<code_content>	9	Mirror	<code_mirror>
2	Code Type	<code_type>	10	Code Quality Evaluation	<code_quality>
3	Angle	<code_angle>	11	Trigger No.	<trigger_num>
4	Code Vertex coordinates	<code_vertex_pos>	12	Frame No.	<frame_num>
5	Code Center coordinates	<code_cen_pos>	13	Polling Parameter ID	<polling_group_id>
6	L-Side Angle of DM Code	<DMcode_L_angle>	14	ROI ID	<code_roi_id>
7	Trigger Start Time	<trig_start_time>	15	Newline	<line_feed>
8	Code Score	<code_eval_score>	16	Enter	<carriage_return>

- *** **Output Noread**: Enable this to set the default output content if no code is read during transmission. Edit the output text in **Output NoRead Text**.
- *** **Output Start Text**: The contents of the start part of the data output. You can set the contents as desired.
- *** **Output Stop Text**: The contents of the end part of the data output. You can set the contents as desired.
- *** **Output Barcode Enter Character Enable**: Whether to show input character in the data.
- *** **Output Barcode Newline Character Enable**: Whether to show new-line character in the data.
- ***Add NoRead Enable**: When the code content read does not meet the specified min. code length, this parameter will add the content to the required length for output.
  - **Off**: Output the code content.
  - **Add Noread**: Add the content to the required length for output.
  - **Just Noread**: Output Noread without adding.
- **Code Pos Width Enable**: When the code coordinates do not meet the specified length, this parameter will add 0 to the required length for output. The length of the code coordinates can be set in **Code Pos Width**.

- **Mirror Text Enable**: You can customize mirror characters in the data processing. The mirror characters can be defined through the mirror text parameters, while non-mirror characters defined through the non-mirror text parameters.
- **L-Side Angle Enable**: You can set the acceptable angle range and output text of the L-side angle of the DM code through the following parameters.

Note

This parameter can be used only when the running mode is Normal and DM code is enabled.
- 1/2/3/4 Area Start: It refers to the angle start position of the 1/2/3/4 area.
- 1/2/3/4 Area End: It refers to the angle end position of the 1/2/3/4 area.
- 1/2/3/4 Area Text: It refers to the output text in the 1/2/3/4 area.
- Text out of Area: It refers to the output text out of the 1/2/3/4 area.

9.7 Main-Sub Networking

When multiple devices acquire images and parse codes at the same time, the main-sub networking function enables multiple devices to work together.

The main principle of main-sub networking is to set one of the multiple devices as the main device (main station), and the other devices as sub devices (sub station). The sub devices send the code results to the main device that integrates or forwards, and sends the code results to the connected PC or client software to realize the collaborative work function of multiple devices.

Before You Start

Make sure that the device mode is **Normal** and **Tigger Mode** is **On** before using this function.

Note

The function of main-sub networking may differ by device models.

Steps

1. Go to **Multi Camera Control**, and select **Multi Station Work Mode** according to actual demands.
- Off: This function is disabled.
- Independent: The main device and the sub devices are triggered respectively, and the sub devices send the code reading result to the main device. The main device directly formats and outputs the sub devices' data according to the formatting rules without data processing. It is mainly used for the scenario of multiple assembly lines.
- Cooperation: The main device and the sub devices use the same trigger, the sub devices send the code reading result to the main device for data processing, and then format and output the data after the fusion of the main and sub devices according to the formatting rules. It is mainly used to the scenario where the field of view is insufficient, and multiple codes are read together to integrate the output. In most cases, this mode is used.

2. Set role for different devices in **Station Role**. **Main** is the main device, and **Sub** is the sub device

Note

There is one main device only in the same main-sub networking (same group ID).

3. Set **Station Port** to configure the main station's port number and communicate with the sub station.
4. (Optional) Enable **Client Display Sub Enable** to let the main device display the code reading images from the sub station.

Note

The client software of the main device can acquire images after enabling **Client Display Sub Enable**.

5. Set **MS Group ID** ranging from 100 to 200 to configure the main-sub networking group ID.

Note

Two-way visiting is not allowing among different network groups.

6. (Optional) View enumerated sub station quantity via **Sub Station Total** as a main station role.
7. (Optional) View sub station information after entering **Query Sub Station ID** as a main station role.

- Sub Station IP: The IP information of the sub station.
- Sub Station Connect: The connection status of the sub station. 1 stands for normal data transmission. Otherwise, it is disconnected.
- Sub Station UN: The user name information of the sub station.
- Sub Station MN: The product model information of the sub station.
- Sub Station SN: The serial number of the sub station.

8. (Optional) View main station information when the **Station Role** is **Sub**.

- Main Station IP: The IP information of the main station.
- Main Station Connect: The connection status of the main station. 1 stands for normal data transmission. Otherwise, it is disconnected.
- Main Station UN: The user name information of the main station.
- Main Station MN: The product model information of the main station.
- Main Station SN: The serial number of the main station.

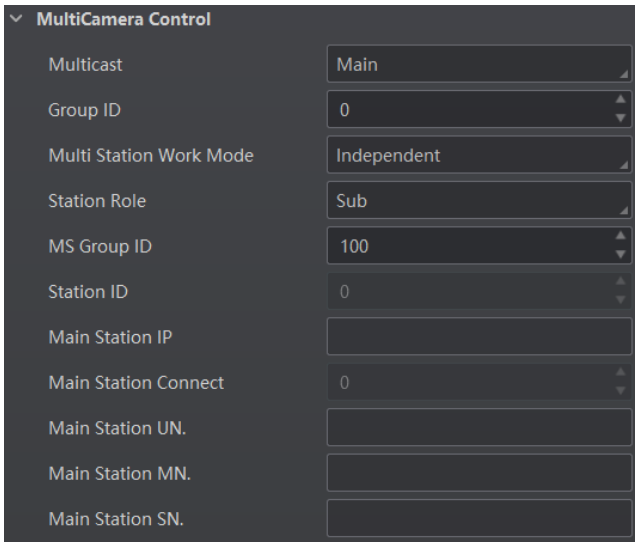


Figure 9-52 Multi Camera Control Parameters

9.8 Contrast Control Settings

Note

You need to set device's running mode as normal before using this function.

The contrast control function compares the data that the device reads with preset data and outputs contrast result. The result can be used as the event source of trigger signal, including **Contrast Success** and **Contrast Fail**. This function has two ways to contrast, including regular contrast and consecutive number contrast.

Regular Contrast

The regular contrast requires you to set code contents in advance, and the client software will contrast the data that the device reads with preset contents and outputs comparison result.

Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to **Contrast Control**, enable **Contrast Enable**, and select **Regular** as **Contrast Rules**.
3. Set **Start Position** that means the stating position of the comparison.
4. Set **Character Number** that means the comparison quantity.
5. Set code contents in **Wildcard String**.

Note

You can use wildcard * and ?. * stands for multiple strings you can use, and ? stands for one string you can use. * can be used once only and ? can be used many times.

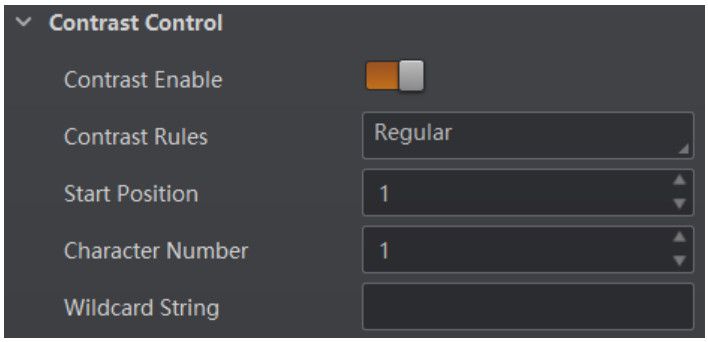


Figure 9-53 Regular Contrast

Consecutive Number Contrast

The consecutive number contrast requires you to set consecutive code rules, and the client software will contrast the data that the device reads with preset rules and outputs contrast result.

Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to **Contrast Control**, enable **Contrast Enable**, and select **Consecutive Number** as **Compare Rules**.
3. Set **Start Position** that means the stating position of the comparison.
4. Set **Digital Number** that means the comparison quantity.
5. Set **Step** that means the client software will increase or decrease the preset value after each comparison according the step you set.

Note

- If the preset value after increase or decrease exceeds the digital number you set, and then the preset value will become 0.
- The base value displays the preset value.

6. (Optional) Click **Execute** in **Contrast Reset** to reset comparison. After that, the client software will use the first code it reads as the preset value.

Here we take start position (3), digital number (2) and step (2) as an example to explain the consecutive number comparison:

- If the first code that the device reads is ur96k, and then the preset value is 96. The preset value increases to 98 (96+2).
- If the second code is yr98kjkfd, and comparison succeeds. The preset value increases to 100 (98+2).
- If the third code is kl99fjkd, and comparison fails. The preset value does not increase.
- If the fourth code is kl00djf, and comparison succeeds. The preset value increases to 02 (00+2).

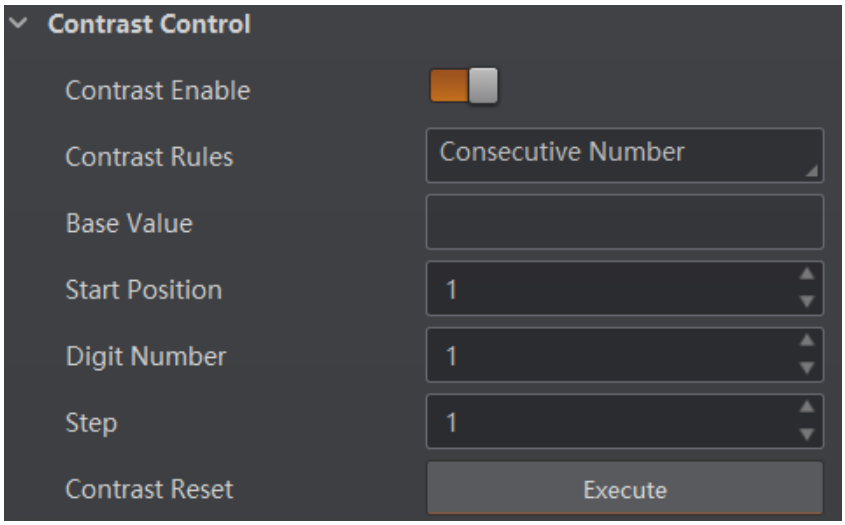


Figure 9-54 Consecutive Number Contrast

9.9 Statistics Information

The statistics information in the feature tree helps you to count data related with code reading.

Note

You need to set device's running mode as normal before using this function.

Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.
2. Go to feature tree, find **Statistics Info.**, and select **Statistics Mode**:
- **All Frames** means the client software will display all data since the device is powered on.
- **Latest Frames** means the client software will display data of the last 10 frames.
3. View related parameters.
4. (Optional) Click **Execute** in **Reset Statistics** to reset statistics information.

Table 9-20 Parameter Description

Parameter Name	Description
Total Frame Number	The total frame quantity.
Read Frame Number	The quantity of frames that have been read codes.
Noread Frame Number	The quantity of frames that have not been read codes.
Read Rate	It refers to the code reading ratio.
Algo Time Ave.	The average time of algorithm, and the unit is ms.
Algo Time Max.	The max. time of algorithm, and the unit is ms.

Parameter Name	Description
Algo Time Min.	The min. time of algorithm, and the unit is ms.
Read Time Ave.	The average time of code reading, and the unit is ms.
Read Time Max.	The max. time of code reading, and the unit is ms.
Read Time Min.	The min. time of code reading, and the unit is ms.
Reset Statistics	Click **Execute** to reset statistics information.

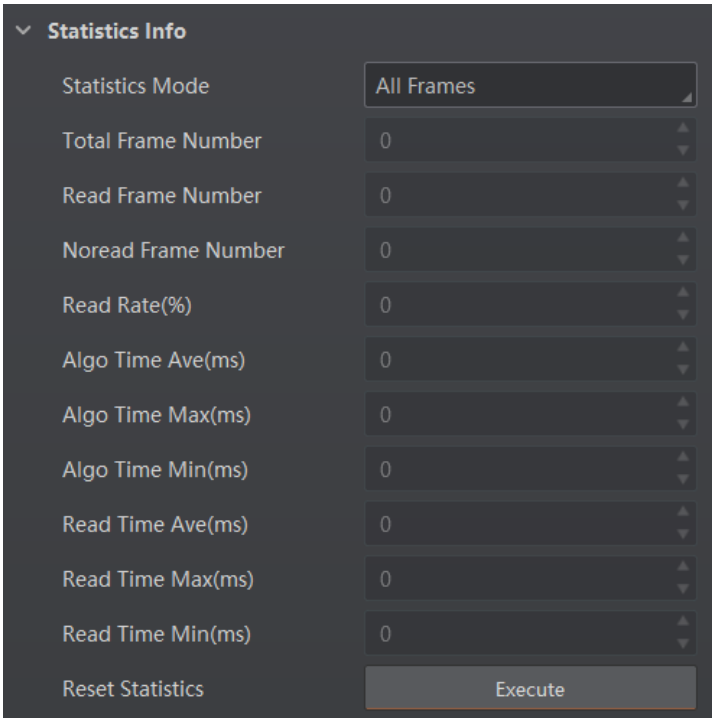


Figure 9-55 Statistics Information

9.10 Diagnose Event Report

The diagnose event report function monitors memory and CPU usage rate, and let you know when there is a crash, higher CPU usage rate, insufficient memory, and other events.

Steps

1. Right click the device in **Device Connection**, and click **Feature Tree**.

2. Go to feature tree, find **Diagnose Event Report**.
3. View relation information.
4. (Optional) Click **Execute** in **Reset Event** to clear all information.

Figure 9-56 Event Report

9.11 User Set Customization

In **Configuration Management**, you can 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.

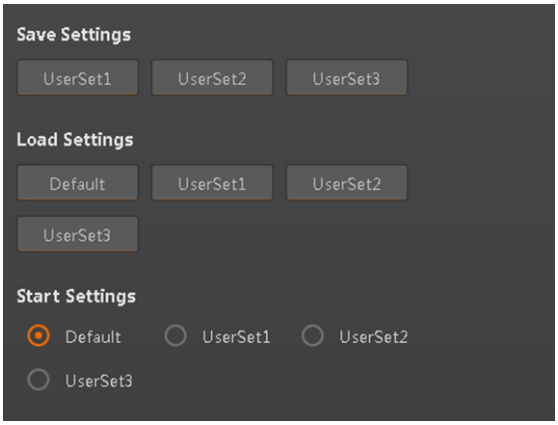


Figure 9-57 User Set Customization

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.

Steps

1. Select the device to be updated in the device list, and right click the device.
2. Click **Firmware Update**.
3. 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.

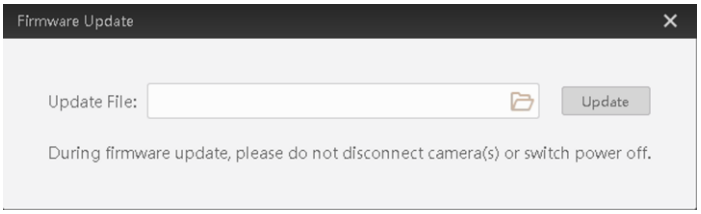


Figure 10-1 Update Firmware

10.2 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 10-2 Set NTP Timing

10.3 Enable Device Auto Work

This function allows the device to automatically enter the operation status after being powered on.
You can go to **Config Management → Device Auto Work Enable**, and enable **Device Auto Work Enable**.

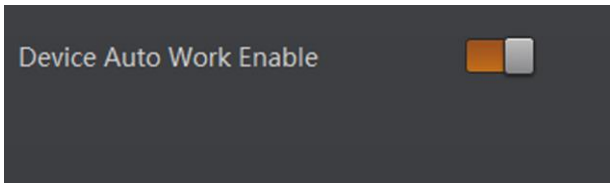


Figure 10-3 Enable Device Auto Work

10.4 Restart Device

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

device, and click **Device Reset**.

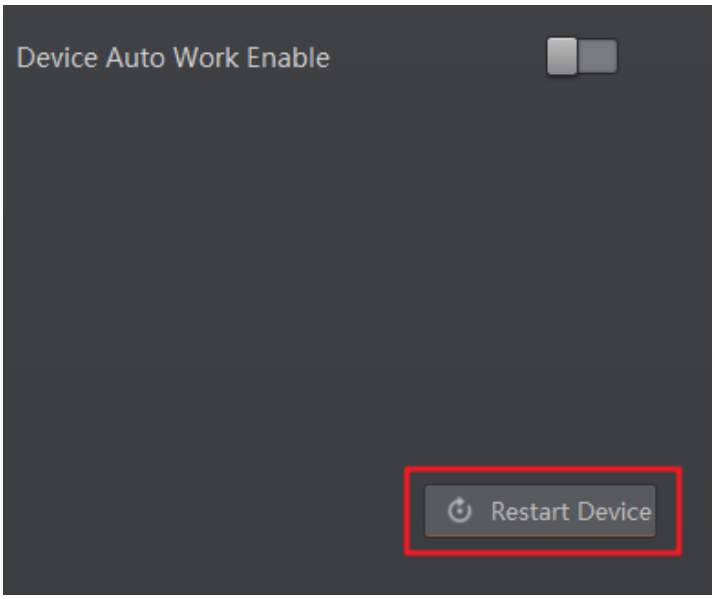


Figure 10-4 Restart Device

Chapter 11 FAQ (Frequently Asked Question)

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

Table 11-1 Question 1

Possible Cause	Solution
The device is powered off.	Check the device's power connection (observe whether the PWR indicator is solid green) to make sure the device is powered up normally.
Network exception occurs.	Check the network connection (the LNK indicator is flashing green if the network exception occurs) to make sure the device can be connected to the network normally, and make sure that the PC and the device are in the same network segment.

11.2 Why the image is very dark?

Table 11-2 Question 2

Possible Cause	Solution
Insufficient brightness of light source.	Increase the brightness of light source appropriately, or change to a brighter one.
Too small value of exposure and gain.	Increase exposure and gain appropriately.

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

Table 11-3 Question 3

Possible Cause	Solution
Network circuitry speed is not 100 Mbps.	Check whether the network transit speed is 100 Mbps or not.

11.4 Why there is no image in the live view?

Table 11-4 Question 4

Possible Cause	Solution
Enabled trigger mode, but there is no trigger signal.	Sent the trigger signal to the device, or disable the trigger mode.
Network circuitry speed is not 100 Mbps.	Check whether the network circuitry speed is 100 Mbps or not.

Chapter 12 Revision History

Table 12-1 Revision History

Version No.	Document No.	Date	Revision Details
V4.0.0	UD42378B	Mar. 31, 2025	Edit the whole structure and content.

Appendix A ASCII Table

Note

The device with USB interface only supports the red color character only regarding setting prefix and suffix characters.

Table A-1 ASCII Table

Character	Value	Character	Value	Character	Value	Character	Value
NUL	0	(SPACE)	20	@	40	`	60
SOH	1	!	21	A	41	a	61
STX	2	"	22	B	42	b	62
ETX	3	#	23	C	43	c	63
EOT	4	$	24	D	44	d	64
ENQ	5	%	25	E	45	e	65
ACK	6	&	26	F	46	f	66
BEL	7	'	27	G	47	g	67
BS	8	(	28	H	48	h	68
HT	9	)	29	I	49	i	69
LF/NL	0a	*	2a	J	4a	j	6a
VT	0b	+	2b	K	4b	k	6b
FF/NP	0c	,	2c	L	4c	l	6c
CR	0d	-	2d	M	4d	m	6d
SO	0e	.	2e	N	4e	n	6e
SI	0f	/	2f	O	4f	o	6f
DLE	10	0	30	P	50	p	70
DC1/XON	11	1	31	Q	51	q	71
DC2	12	2	32	R	52	r	72
DC3/XOFF	13	3	33	S	53	s	73
DC4	14	4	34	T	54	t	74
NAK	15	5	35	U	55	u	75

Character	Value	Character	Value	Character	Value	Character	Value
SYN	16	6	36	V	56	v	76
ETB	17	7	37	W	57	w	77
CAN	18	8	38	X	58	x	78
EM	19	9	39	Y	59	y	79
SUB	1A	:	3A	Z	5A	z	7A
ESC	1B	;	3B	[	5B	{	7B
FS	1C	<	3C	\	5C	|	7C
GS	1D	=	3D	]	5D	}	7D
RS	1E	>	3E	^	5E	~	7E
US	1F	?	3F	_	5F	DEL	7F

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