

Hikrobot Co., Ltd.

ID7000 Series Logistics Code Reader

User Manual

HIKROBOT

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Symbol Conventions

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 ID7000 Series Logistics Code Reader.

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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.

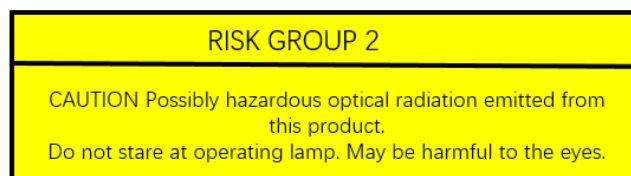
1.2 Safety Instruction



Caution

- In the use of the device, you must be in strict compliance with the electrical safety regulations of the nation and region.
- 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.
- 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.
- Use the power adapter provided by the official manufacturer. The power adapter must meet the Limited Power Source (LPS) requirements. For the specific power consumption of the device, please refer to the device's specifications.
- Do not cover the device's plug or outlet for disconnecting power supply.
- It is strictly forbidden to wire, maintain, and disassemble the device is powered on. Otherwise, there is a danger of electric shock.
- Avoid aiming the lens at strong light such as lighting, sunlight, or laser beams, etc., otherwise the image sensor will be damaged.
- It is forbidden to touch the image sensor directly. If necessary, please moisten a soft clean cloth with alcohol and gently wipe off the dust. When the device is not in use, please add a dust cover to protect the image sensor.

- 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.
- Caution: If the device has battery, risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.
- Please dispose of the device in strict accordance with the relevant national or regional regulations and standards to avoid environmental pollution and property damage.
- 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.
- Make sure that there is no reflective surface too close to the device lens. The light from the device may reflect back into the lens causing reflection.
- For the device with this sticker:



- The beam of the light of this device is classified as Risk Group 2 (RG2) retinal blue light or thermal hazard, and the beam of the light at the distance of 0.40 m is classified as Risk Group 1 (RG1). The safety distance is 5.05 m.
- Possible hazardous optical radiation emitted from this product. Do not stare at operating light source. May be harmful to the eyes.
- If appropriate shielding or eye protection is not available, turn on the light only at a safe distance or in the area that is not directly exposed to the light.
- When assembling, installing or maintaining the device, do not turn on the light, or wear eye protection.

Note

- Check whether the device's package is in good condition, whether there is damage, intrusion, moisture, deformation, etc. before 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.
- Do not use the product in extremely heat, extremely cold, dusty environment, corrosive environment or high humidity environment.
- The device should not be placed with exposed flame sources, such as lighted candles.
- 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.

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.

Chapter 2 Overview

2.1 Introduction

The device is mainly used in logistics code reading scenario. The image is acquired via the image sensor, and processed by the algorithm of the device to analyze the meaning of codes in the image. The device can quickly transmit images and code analysis results in real time via the GigE cable. Through the client software, you can acquire images and set different parameters.

2.2 Key Features

- Built-in code reading algorithm to read different types of one-dimensional and two-dimensional codes with good robustness.
- Supports image stitching and outputting combined images according to order.
- Adopts image sensor to acquire and provide high-quality images.
- Supports different trigger modes and image acquisition modes.
- Adopts multiple I/O connectors for input/output signals.
- Supports RS-232 serial communication protocol.
- Integrated light source design with LED lights.

Note

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

Chapter 3 Appearance

Note

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

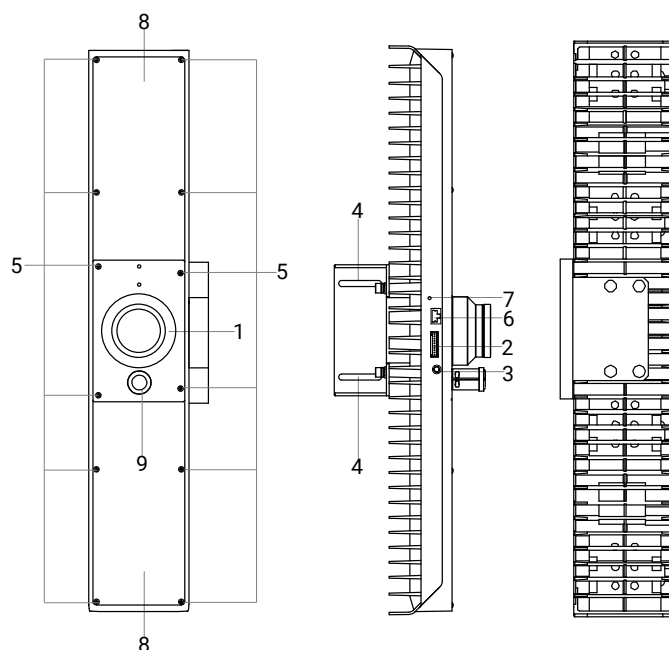


Figure 3-1 Device with 10-Pin Green Terminal, F Lens Mount, and LED Aimer (Type I)

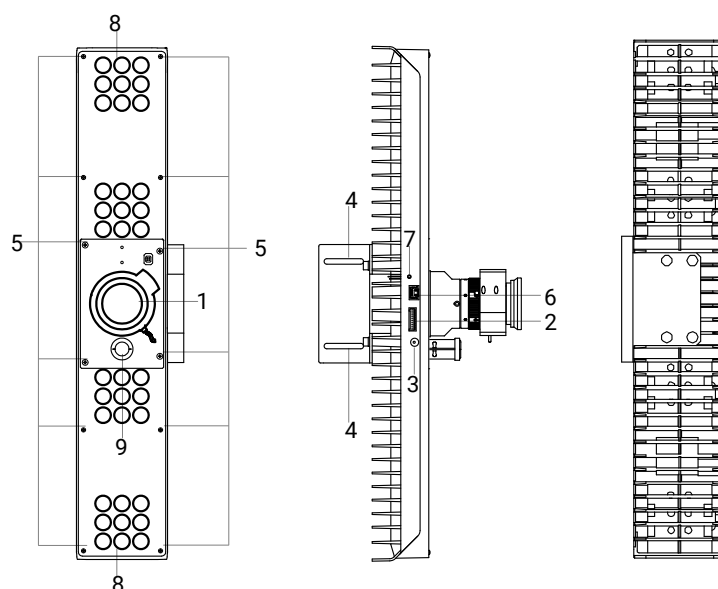


Figure 3-2 Device with 10-Pin Green Terminal, F Lens Mount, Lens, and LED Aimer (Type II)

Table 3-1 Component Description

No.	Name	Description
1	Lens	It refers to the lens. Refer to the device's datasheet for specific parameters.
2	I/O Connector	It provides I/O and serial port signal. Refer to section 10-Pin Green Terminal for details.
3	Power Supply Interface	It provides the power supply for the device. The power supply is 48 VDC.
4	Screw Hole	It is used to fix the device. It is recommended to use the supplied M6 screws in the package. For the devices with 10-pin green terminal, it has 2 slotted holes on the bottom, and you can adjust distance.
5	Screw	It is used to fix the device body and the front/rear cover. For the devices with 10-pin green terminal, it is recommended to use M3 Phillips screw.
6	Gigabit Ethernet Interface	It refers to the gigabit Ethernet interface for transmitting data.
7	LED Indicator	It indicates the operating status of the device. Refer to section Indicator for details.
8	Light Source	It refers to the LED lights that provide lighting. The light source can be controlled via LineOut2.
9	Aimer	It is used to emit a green LED horizontal line that allow the field-of-view to be clearly mapped to the desired target.

Chapter 4 Connector and Indicator

4.1 10-Pin Green Terminal

The device has a 10-pin green terminal that provides input and output signals, and the serial port signal.

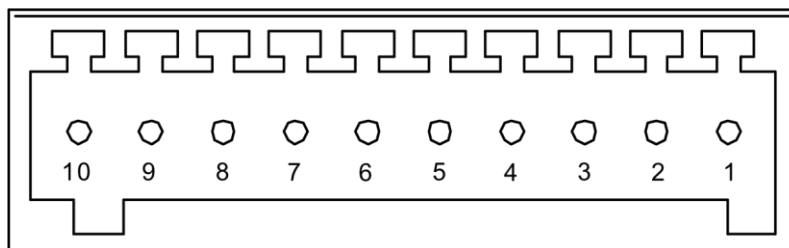


Figure 4-1 10-Pin Green Terminal

Table 4-1 Pin Definitions of 10-Pin Green Terminal

No.	Signal	I/O Signal Source	Description
1	OPTO_OUT0	LineOut0 signal line	Opto-isolated output 0
2	OPTO_OUT1	LineOut1 signal line	Opto-isolated output 1
3	GND	--	RS-232 serial port ground
4	OUT_COM	LineOut0/1 signal ground	Output common terminal
5	OPTO_IN0+	LineIn0+ signal line	Differential input 0+
6	OPTO_IN0-	LineIn0- signal line	Differential input 0-
7	OPTO_IN1	LineIn1 signal line	Opto-isolated input 1
8	IN_COM	LineIn1 signal ground	Input common terminal
9	RS232_TX	--	RS-232 serial port output
10	RS232_RX	--	RS-232 serial port input

4.2 Indicator

The device's indicator is used to indicate the operating status of the device.

Table 4-2 Indicator Description

Indicator Status	Device Status	Solution
Unlit	Power supply exception occurs.	Check the wiring of the power supply cable.
Solid blue	The device runs normally.	--
	Network exception occurs.	Check the network cable wiring.
	The device's software is not started.	Restart the device, and check the system compatibility.
	The device exception occurs.	Restart the device and check its firmware version.

Chapter 5 Device Installation

5.1 Installation Preparation

You need to prepare following accessories before installation.

Table 5-1 Accessories

No.	Name	Quantity	Description
1	I/O Cable	1	It refers to a 10-pin green terminal to open cable (7 meters), and it is supplied in the package.
2	Network Cable	1	It refers to the supplied gigabit Ethernet cable (10 meters).
3	DC Switch Power Supply	1	It refers to the supplied DC switch power supply of 48 VDC, above 5 A.
4	Power Supply Cable	1	It refers to the supplied power supply cable with DC connector (10 meters).
5	Lens	1	It refers to the supplied lens.
6	Reflector	1	When using the device, you need to have a reflector to read codes on the bottom. You should purchase separately. Refer to the image below for reference.
7	Reflector Bracket	1	It is used to set up the reflector, and you should purchase separately.

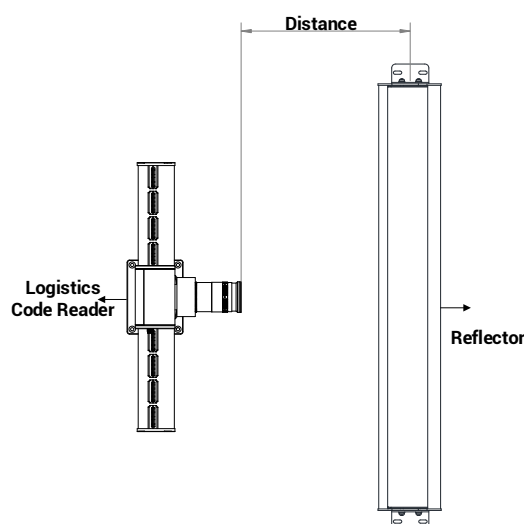


Figure 5-1 Industrial Code Reader and Reflector

5.2 Installation Scheme (Six-Sided Code Reading System)

5.2.1 Requirements

Table 5-2 Requirements

No.	Requirement Item	Parameters
1	Conveyor Belt Width	1000 mm (parcel in the center)
2	Speed	1.5 m/s
3	Depth of Field	700 mm
4	Code Minimum Unit Width (Narrow Bar / Narrow Space)	10 mil
5	Code Length	60 mm
6	Parcel Size	Max. 700 mm × 700 mm × 700 mm
7	Code Adhesive Surface	Front, back, left, right, top, and bottom

5.2.2 Five-Sided Code Reading Scheme

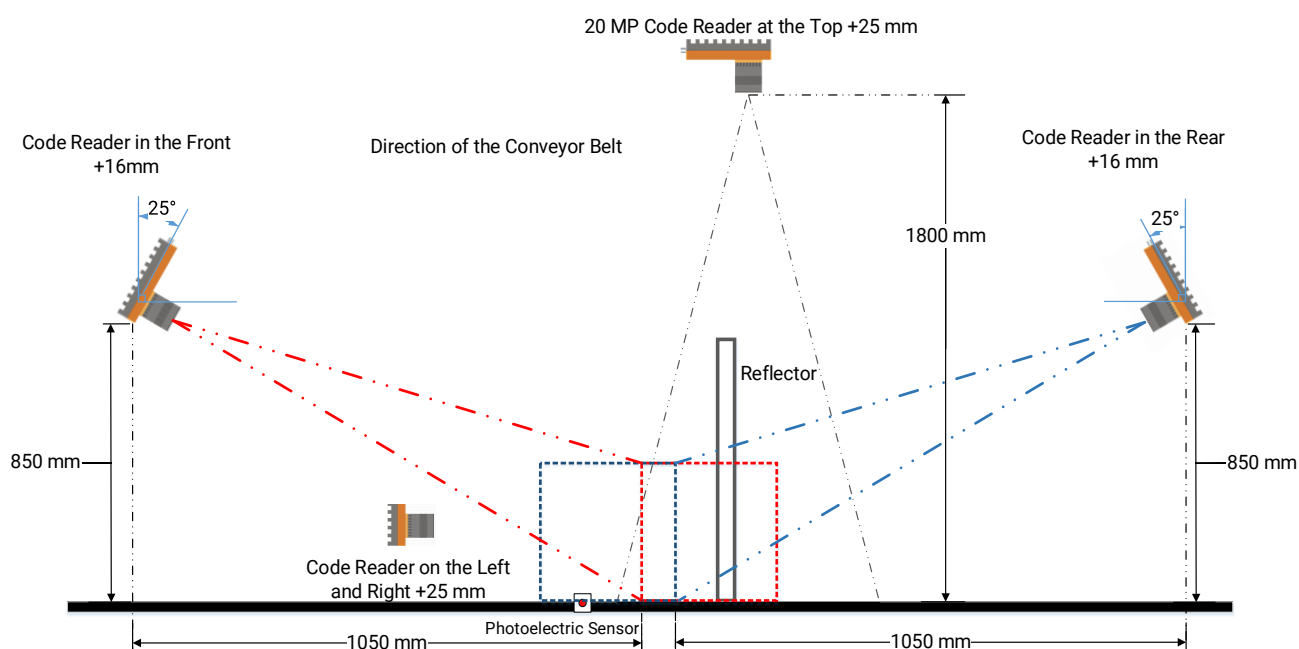
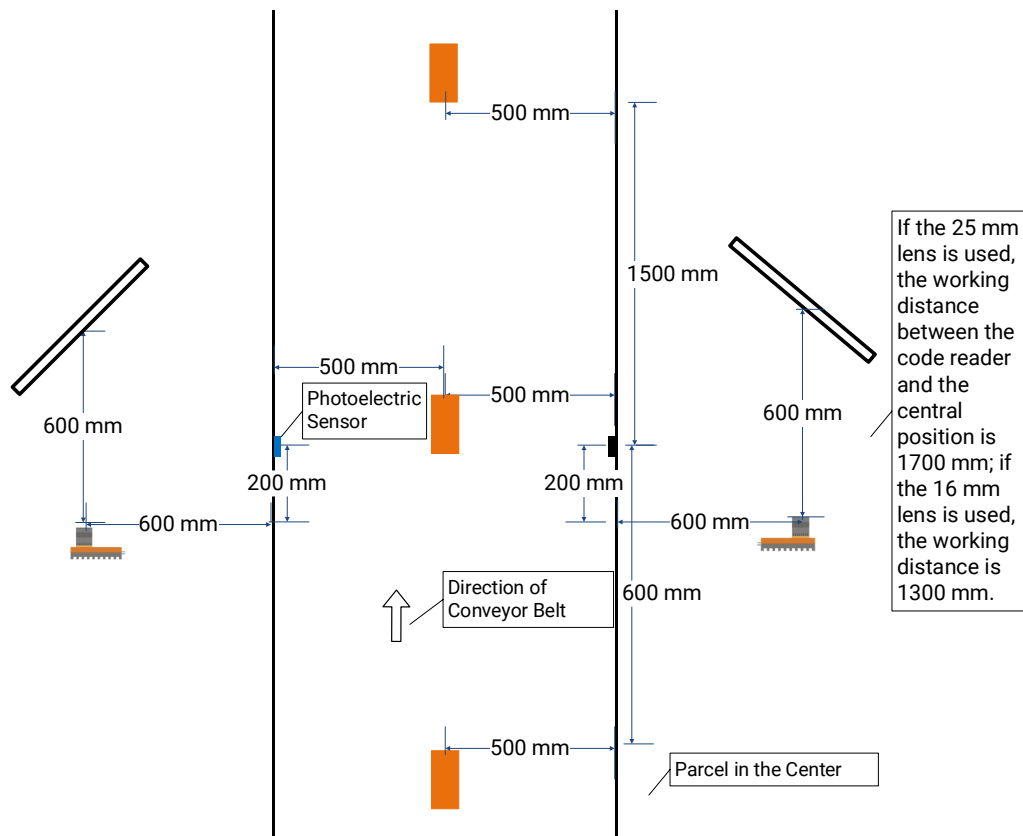
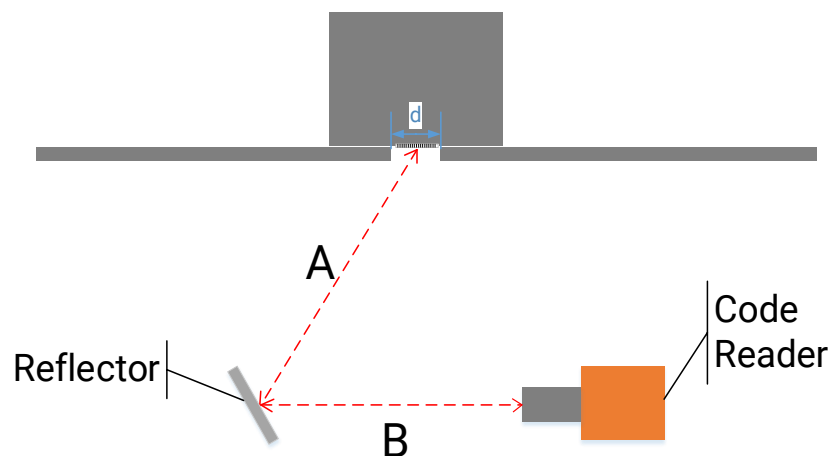


Figure 5-2 Side View



5.2.3 Bottom-Sided Code Reading Scheme

The code reader with 35 mm lens can read the barcode on the bottom of the parcel via the reflector.



Note

- Calculate the field of view and the working distance according to the actual demands. You need to ensure that A plus B equals the working distance even if the conveyor heights are different. The working distance here is 1000 mm.
 - It is not recommended that the reflector is installed starting directly below and moving upwards. It will not only accumulate dust, but will also result in the barcode with the film not being recognized. You can adjust the angle of the reflector to achieve inclined mounting of the code reader.
 - Depending on the actual demands, it is recommended that the spacing between the front and rear conveyor belts (d) is greater than or equal to 30 mm for imaging. The spacing cannot be too large, otherwise it will cause the parcel jumping and affect the image quality.
-

Chapter 6 I/O Electrical Features and Wiring

This section introduces the I/O electrical features and wiring of the device. The device with 10-pin green terminal has one opto-isolated input, one differential input, and two opto-isolated outputs.

6.1 Input Signal

The device's LineIn 1 is opto-isolated input, and its internal circuit is as follows.

Note

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

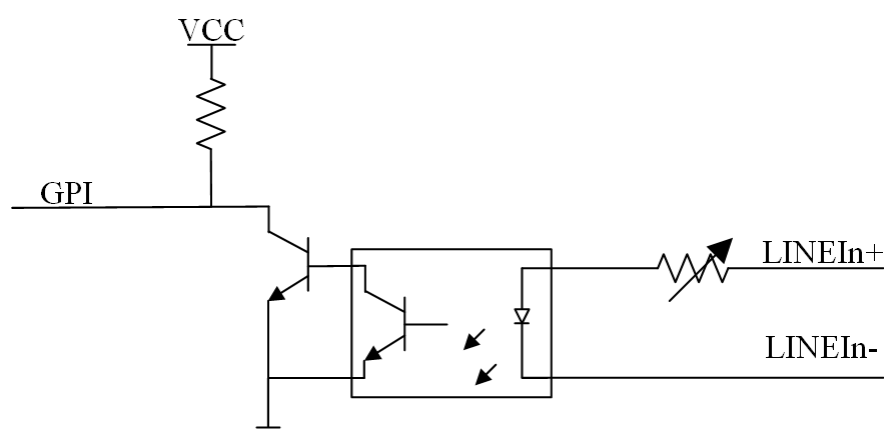


Figure 6-1 Internal Circuit of Input Signal

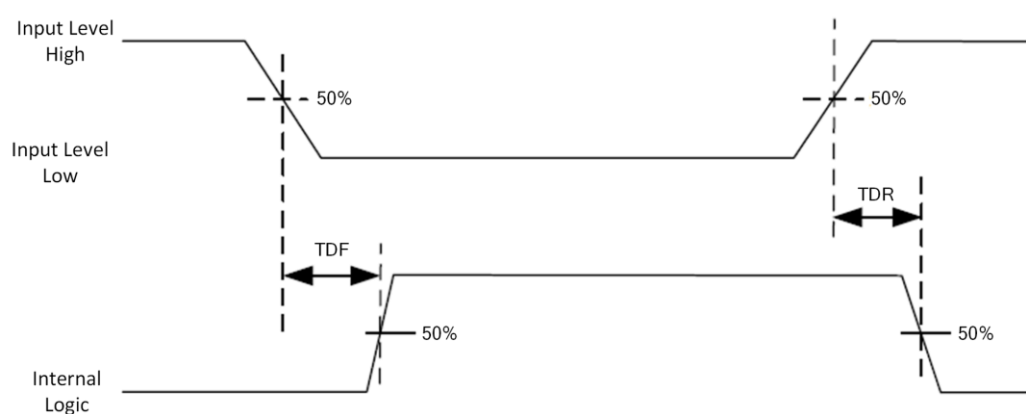
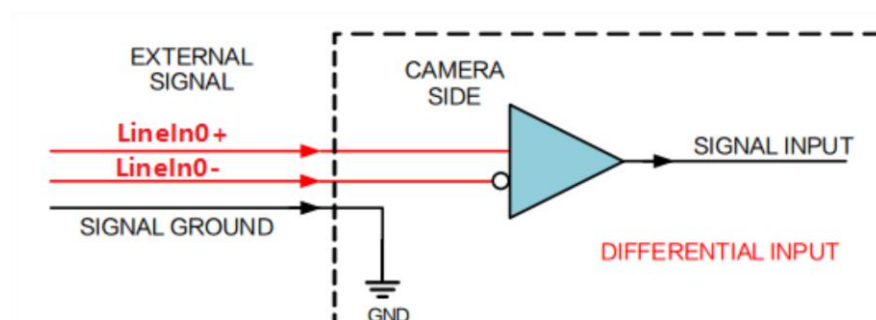


Figure 6-2 Input Logic Level

Table 6-1 Input Electrical Feature

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

The device's LineIn0+/- are differential inputs, and their internal circuit is as follows.

**Figure 6-3 Internal Circuit of Differential Input**

Note

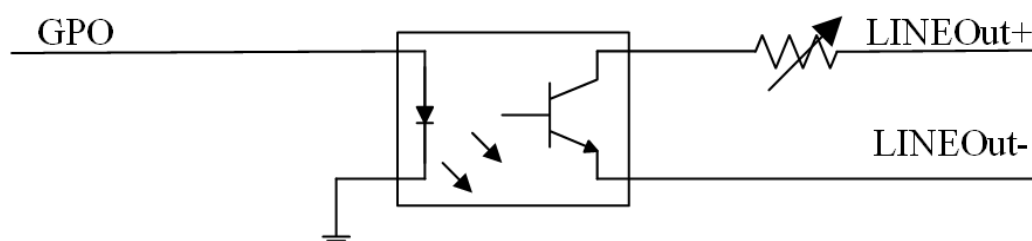
The input voltage ranges from 5 VDC to 30 VDC.

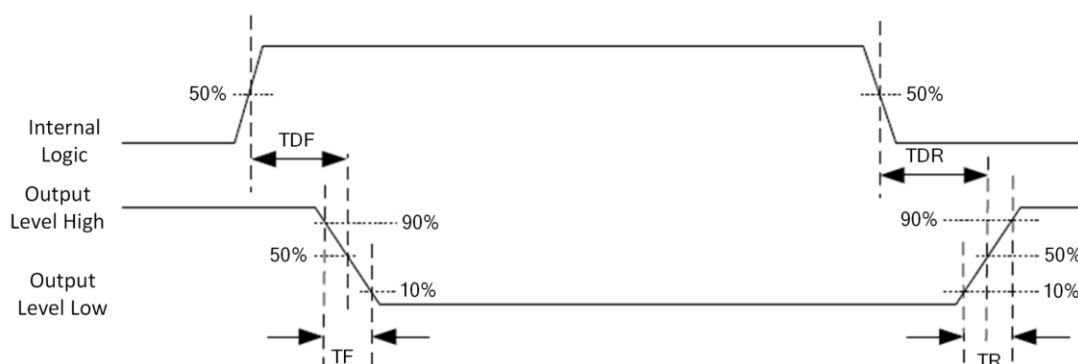
6.2 Output Signal

The device's LineOut 0/1 are opto-isolated outputs, and their internal circuit is as follows.

Note

- The output voltage ranges from 5 VDC to 30 VDC.
- The maximum output current is 45 mA.
- Do not directly connect with inductive load (e.g. DC motor, etc.) when outputting.

**Figure 6-4 Internal Circuit of Output Signal**

**Figure 6-5 Output Logic Level**

When the external voltage is 12 VDC and the external resistance is 1 KΩ, the electrical feature of opto-isolated output is shown below.

Table 6-2 Output Electrical Feature

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

Note

If the external voltage and resistance change, the corresponding current of output signal and output logic level low may differ.

6.3 Input Signal Wiring

The device can receive external input signal via its I/O connector. This section introduces how to wire the device to different types of external devices.

Note

Input signal wiring may differ with different types of external devices.

LineIn0 Wiring with PNP Device

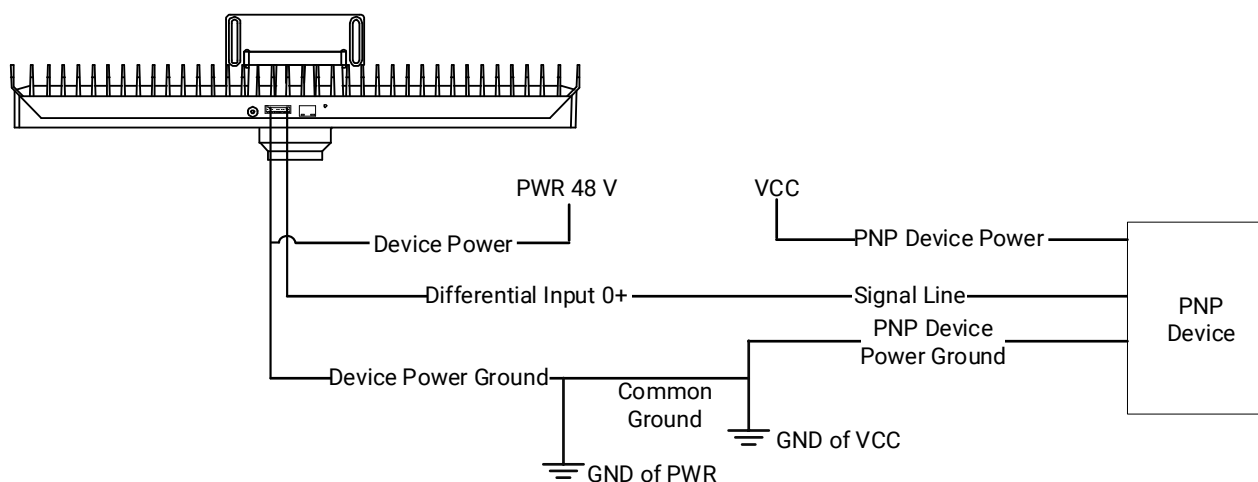


Figure 6-6 LineIn0 Wiring with PNP Device

Note

The differential input 0- signal is not used and no wiring is required.

LineIn1 Wiring with PNP Device

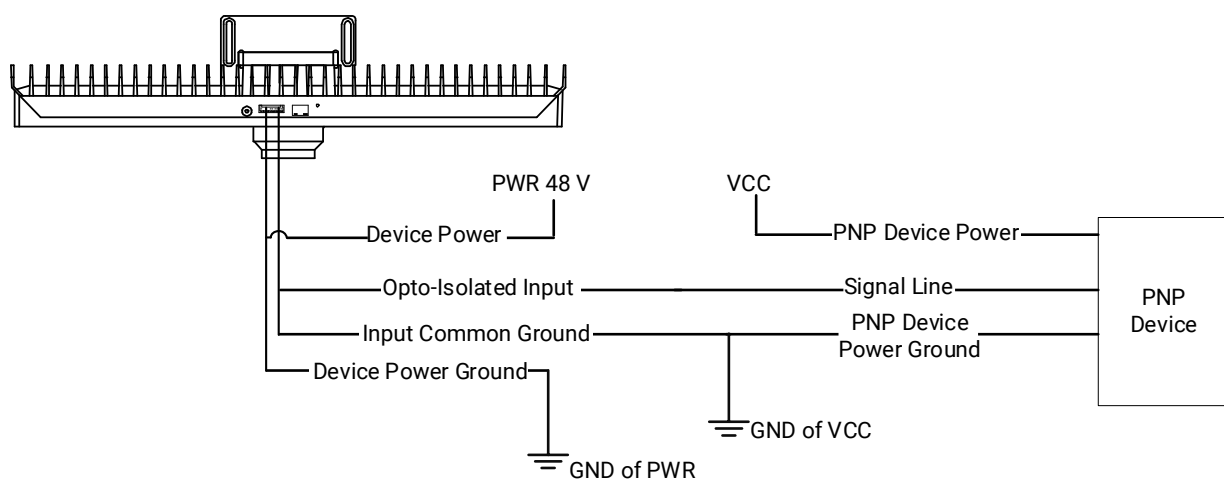


Figure 6-7 LineIn1 Wiring with PNP Device

LineIn0 Wiring with NPN Device

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

as follows.

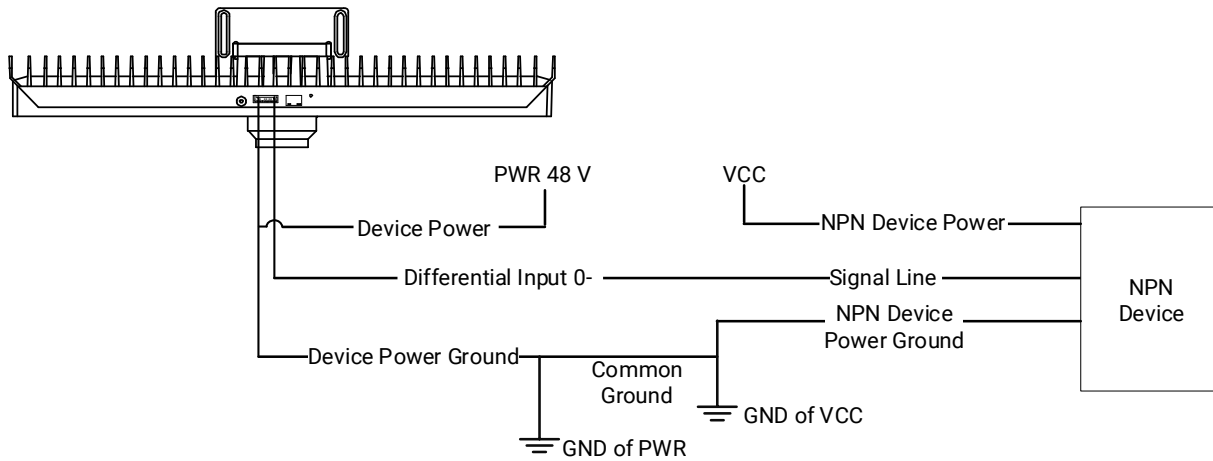


Figure 6-8 Lineln0 Wiring with NPN Device

Note

The differential input 0+ signal is not used and no wiring is required.

Lineln1 Wiring with NPN Device

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

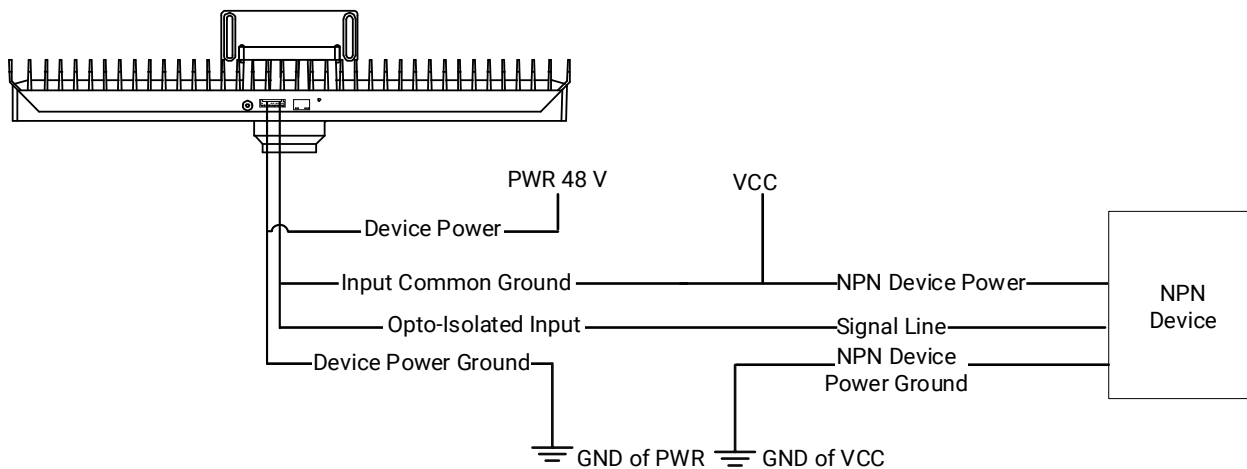


Figure 6-9 Lineln1 Wiring with NPN Device Without Pull-Up Resistor

If the VCC of NPN device is 12 VDC or 24 VDC and pull-up resistor is used, its wiring is as

follows.

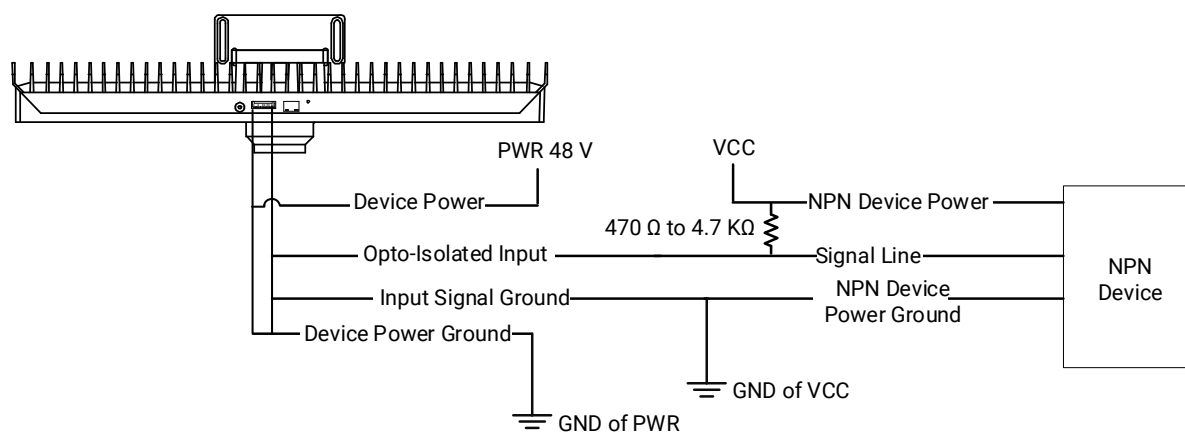


Figure 6-10 Lineln1 Wiring with NPN Device with Pull-Up Resistor

Note

Lineln0 is not used and no wiring is required.

Lineln0 Wiring with Encoder Device

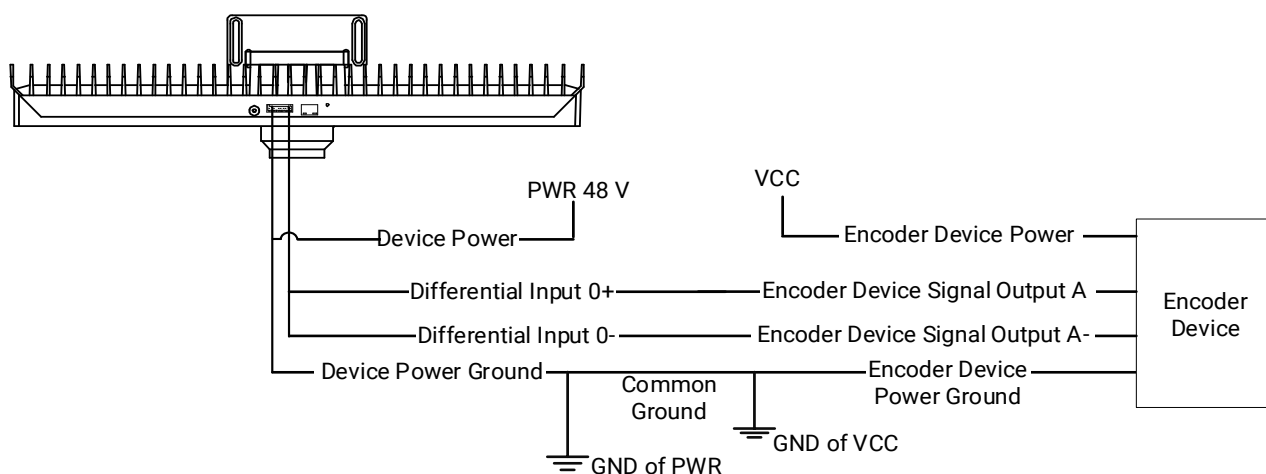


Figure 6-11 Lineln0 Wiring with Encoder Device

LineIn0 Wiring with Line Trigger Device

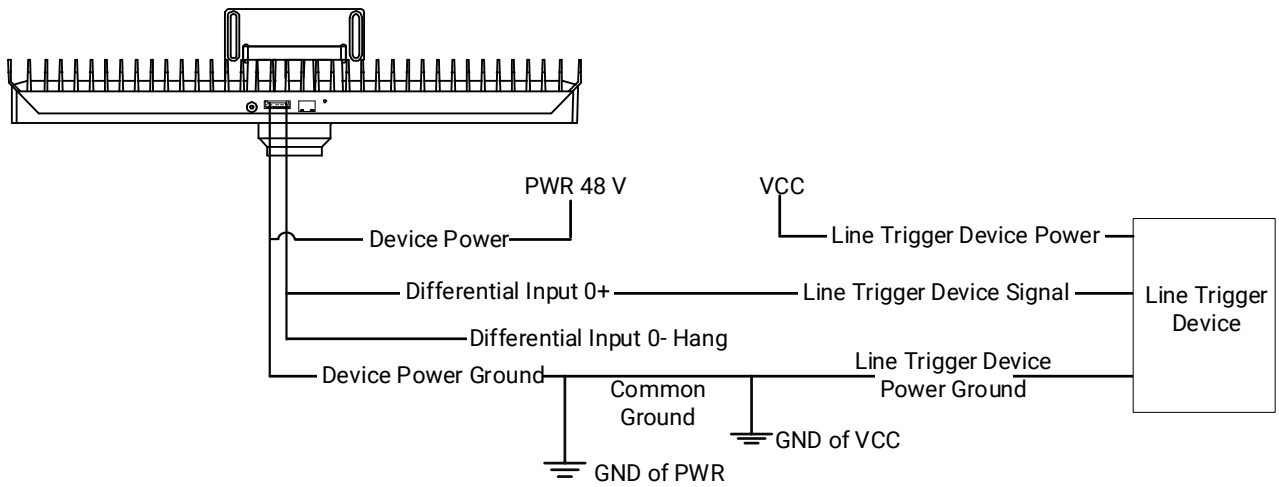


Figure 6-12 LineIn0 Wiring with Line Trigger Device

6.4 Output Signal Wiring

The device can output signals to external devices via its I/O connector. This section introduces how to wire the device to different types of external devices.

Note

- Here we take LineOut0 as an example to introduce the input signal wiring.
- Output signal wiring may differ with different types of external devices.

PNP Device

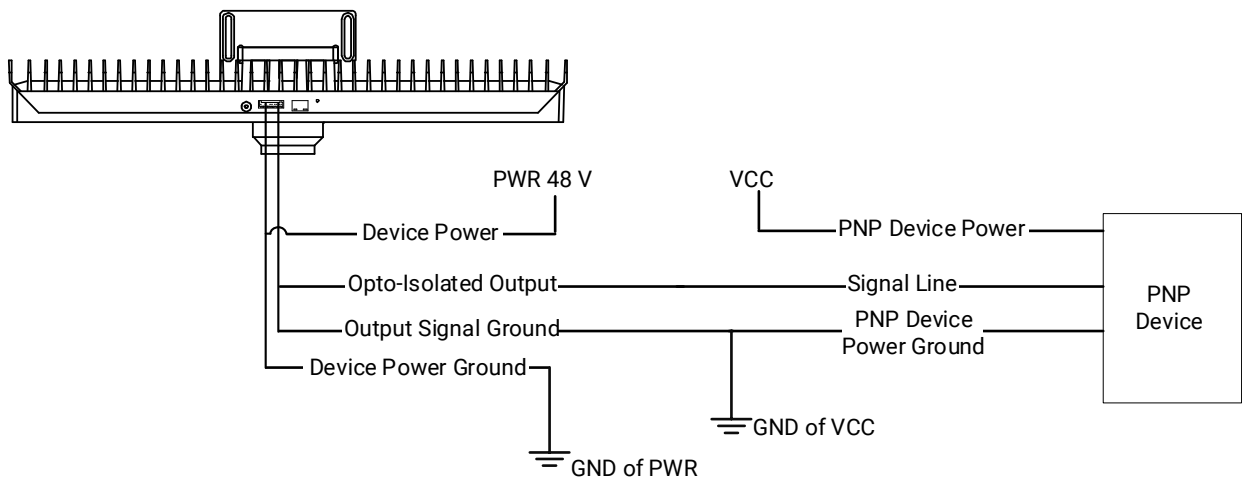


Figure 6-13 Output Signal Connects PNP Device

NPN Device

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

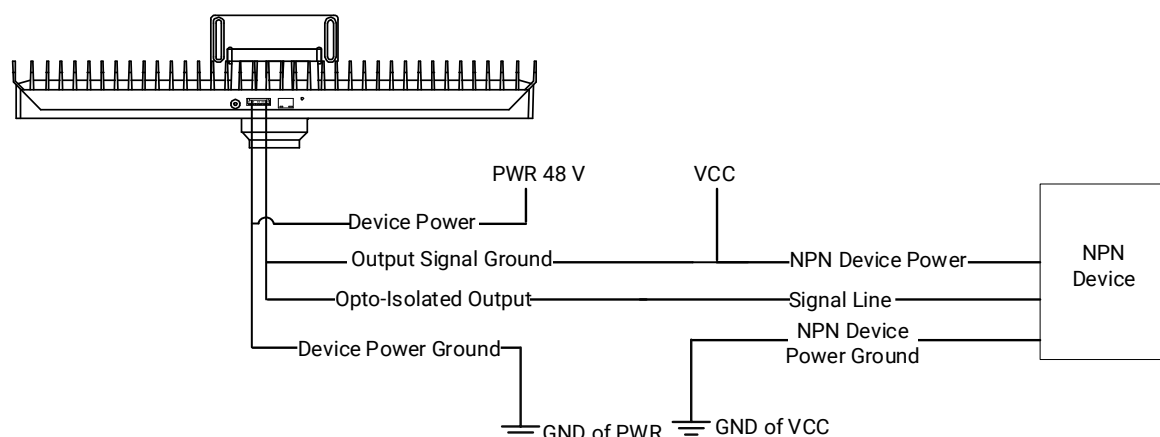


Figure 6-14 Output Signal Connects to NPN Device Without Pull-Up Resistor

If the VCC of NPN device is 12 VDC or 24 VDC and pull-up resistor is used, its wiring is as follows.

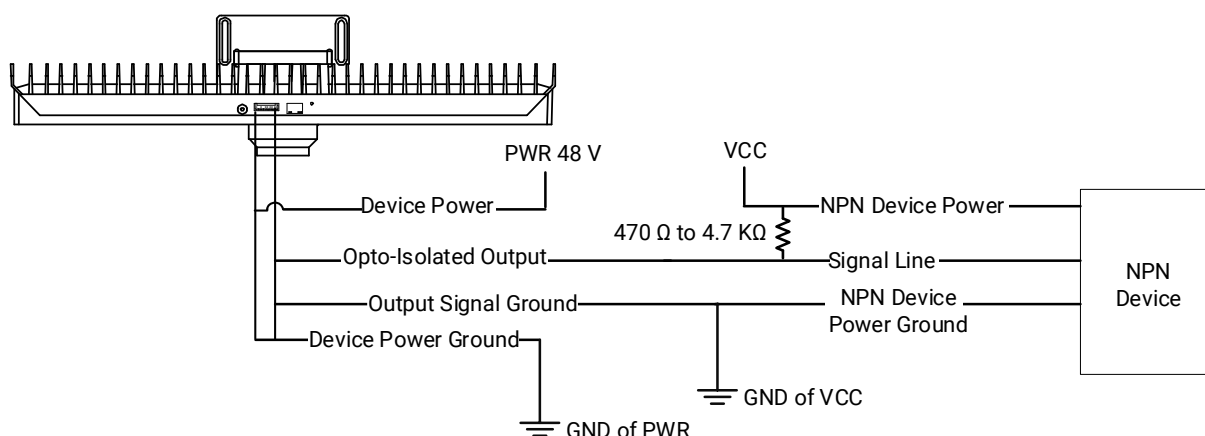


Figure 6-15 Output Signal Connects to NPN Device with Pull-Up Resistor

6.5 RS-232 Serial Port

The device supports output via RS-232 serial port. The 9-pin male connector and 25-pin male connector are commonly used serial ports, as shown below. You can refer to the table below

for the specific pin name and function.

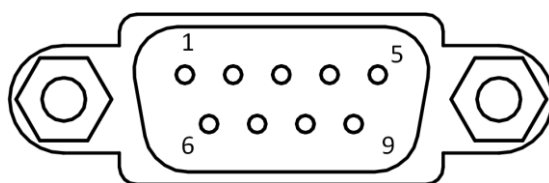


Figure 6-16 9-Pin Male Connector

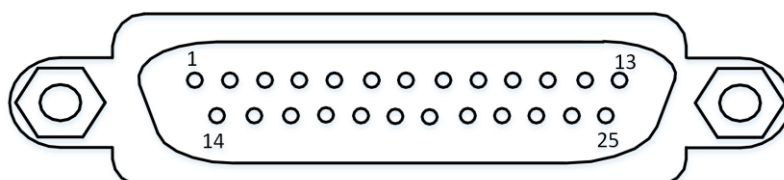


Figure 6-17 25-Pin Male Connector

Table 6-3 Pin Definitions

Serial Port Type	Pin No.	Name	Function
9-Pin Male Connector	2	RX	Receive data
	3	TX	Send data
	5	GND	Signal ground
25-Pin Male Connector	2	TX	Send data
	3	RX	Receive data
	7	GND	Signal ground

You can refer to the serial port wiring below to connect the device with an external device.

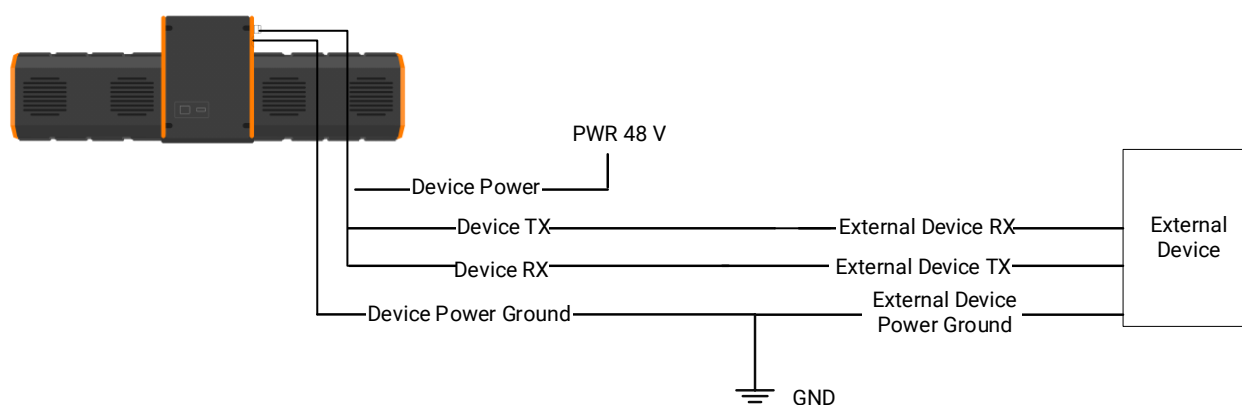


Figure 6-18 RS-232 Serial Port Wiring

Chapter 7 Device Connection

Device connection to the client software is required for device's configuration and operations. This section introduces how to set PC environment, install the client software, 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 and 64-bit Windows 11.
 - The client software has integrated the required driver.
 - 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**.

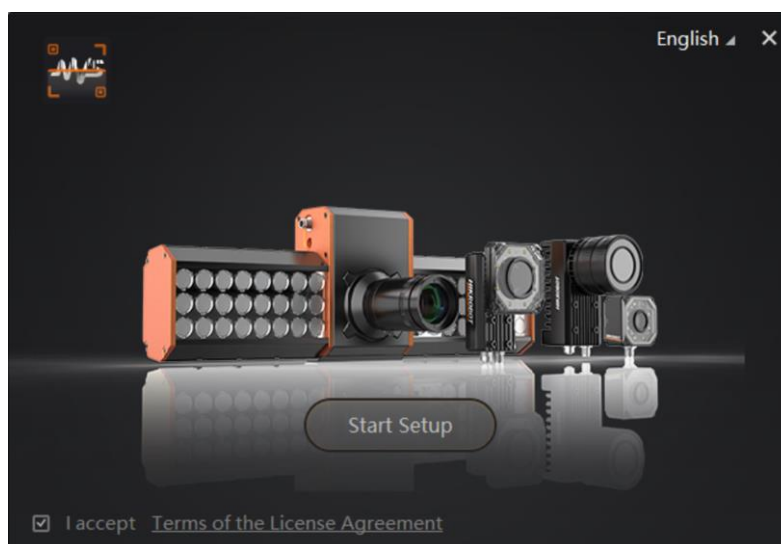


Figure 7-1 Installation Interface

6. Finish the installation according to the interface prompts.

7.2 Turn off Firewall

To ensure stable client running and image transmission, you are recommended turning off Windows firewall before using the client software.

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)**.

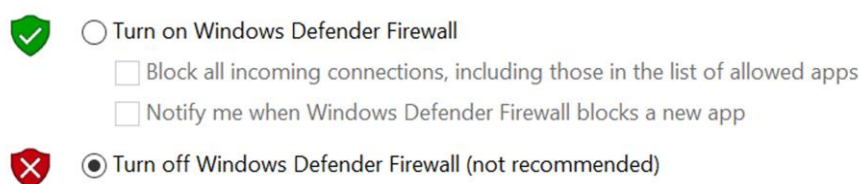


Figure 7-2 Windows Defender Firewall

4. Click **OK**.

7.3 Set PC Environment

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.

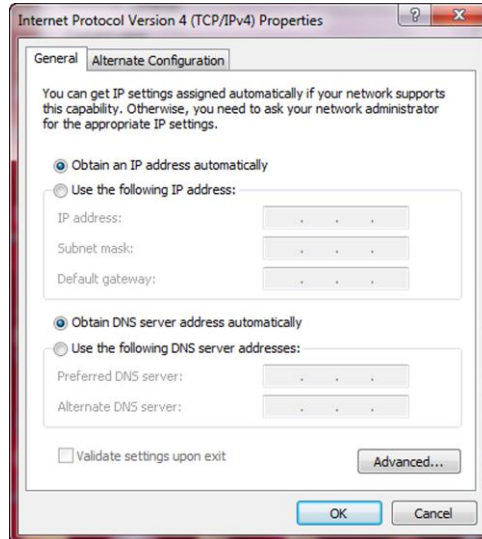


Figure 7-3 Set PC Network

3. Set NIC property.
 - 1) Go to NIC settings page: **Control Panel** → **Hardware and Sound** → **Device Manager** → **Network Adapter**.
 - 2) Select corresponding network interface card, and click **Advanced**.
 - 3) Set **Jumbo Packet** value to 9014 Bytes, **Transmit Buffers** and **Receive Buffers** to 2048, **Interrupt Moderation Rate** to Extremum.

Note

The value may vary from different network interface cards. Just set the maximum value if value changes.

7.4 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**.

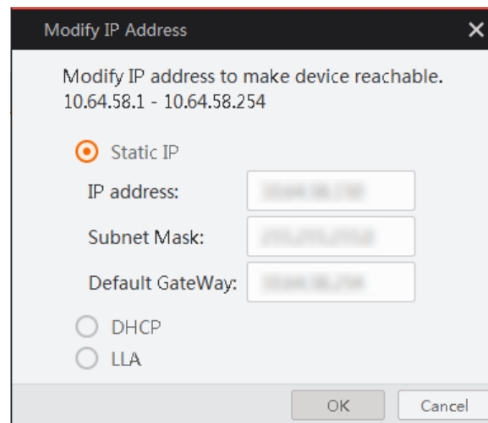


Figure 7-4 Modify IP Address

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

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.

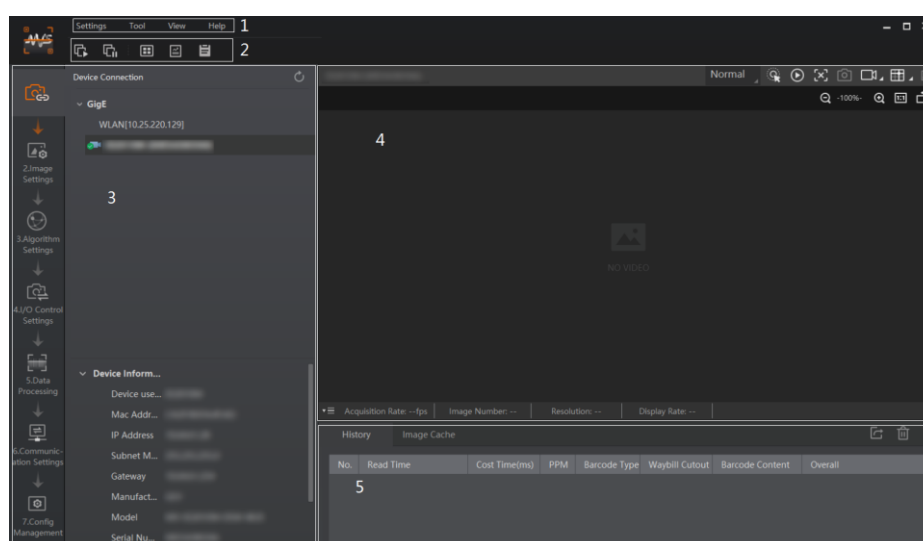


Figure 8-1 Main Window

Table 8-1 Description of Main Window

No.	Name	Description
1	Menu Bar	The menu bar displays function modules, including Settings , Tool , View , and Help .
2	Control Toolbar	The control toolbar provides quick operations for the device. You can click different icons to start or stop batch acquisition, change window layout, view statistics information, and device log.
3	Device Configuration Wizard Panel	You can connect or disconnect device, set parameters, and modify device IP address in this area.

No.	Name	Description
4	Live View Window	This area displays the acquisition images and algorithm reading result in real-time. You can click different icons to capture and save image, record, etc.
5	History Record and Image Cache	This area displays different code information read by the device in real-time. You can also set image cache here.

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 codes, set code number, etc.
4	I/O Control Settings	You can set parameters related with input and output.
5	Data Processing	You can set filter rule for output result.
6	Communication Settings	You can select different communication protocols, and set related parameters for output result.
7	Configuration Management	You can save and load user parameters, and restart the device.

8.2 Basic Operation

Steps

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

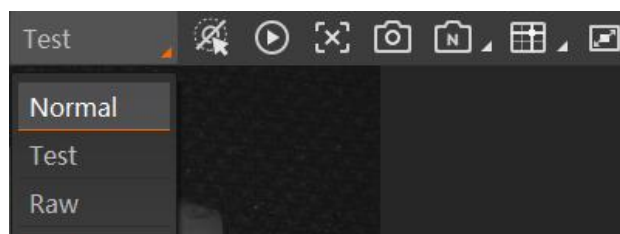


Figure 8-2 Select Running Mode

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.

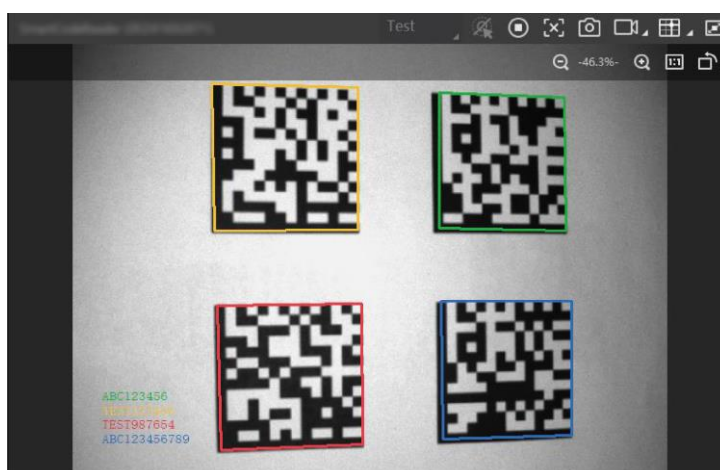


Figure 8-3 Code Reading Effect

Note

If the effect is not very good, you can go to **Image Settings** to adjust related parameters, such as exposure time, gain, and Gamma.

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

No.	Read Time	Output Total Cos	Cost Time(ms)	PPM	Barcode Type	Waybill	Barcode Content	Overall Gr	Code Score
34	2023/6/21 16:05:15:149	3155481	120	2.6	Code 128		313200953000000...	E	/
33	2023/6/21 16:05:14:894	3155223	115	13.6	QRCode		313200953002023...	A	/
32	2023/6/21 16:05:14:894	3155223	115	5.2	Code 128		313200953	E	/

Figure 8-4 History Record

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.

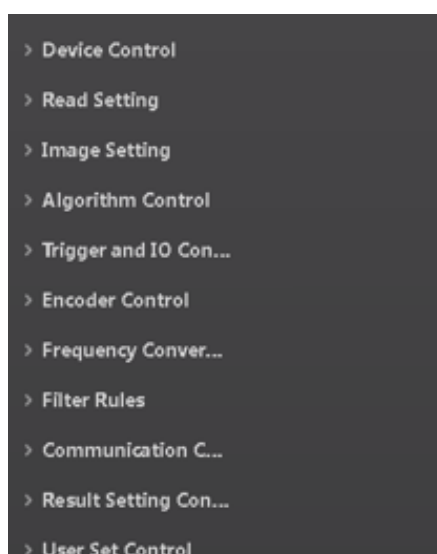


Figure 9-1 Feature Free

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.
Trigger and IO Control	It allows you to set parameters of input and output.
Encoder Control	It allows you to set encoder-related parameters.
Frequency Converter	It allows you to set parameters related to frequency converter

Name	Description
Control	control.
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.
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 different image parameters like exposure time, gain, Gamma, acquisition frame rate, line rate, etc. in **Image Settings**.

Note

- For specific parameter range like exposure time, gain and acquisition frame rate, refer to the device's specification for details.
 - Specific parameters of this function may differ by device models.
-

Table 9-2 Set Image Parameters

Name	Description
Exposure(μ s)	You can increase exposure time to improve image brightness.  Note Increasing exposure time may reduce 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

Name	Description
	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.
Acquisition Line Rate	Line rate refers to the number of lines that is acquired by the device per second. You can adjust it via Auto Line Rate Control . Refer to section Set Auto Line Rate for details.

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 Auto Line Rate

Some device models support automatic calculation and application of line rate via reading QR code within the field of view, ensuring image clarity and improving decoding rates.

Before You Start

Make sure that the **Acquisition Line Rate** has been set for the device, and the QR code is placed in the field of view.

Steps

1. Go to **Feature Tree** → **Auto Line Rate Control**.
2. Set the maximum running time during auto line rate via **Auto LineRate Timeout**.
3. Click **Execute** in **Auto Line Rate Start** to start calculating line rate.

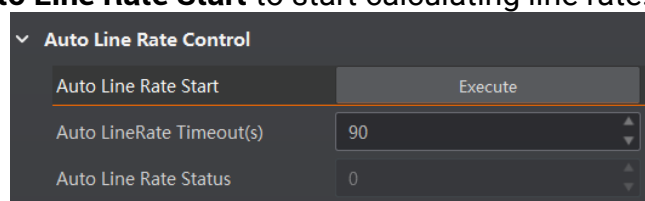


Figure 9-2 Set Image

Note

You can view the progress in **Auto Line Rate Status**. When the value is 100, it means that the auto line rate calculation is completed, and the value in **Acquisition Frame Rate** will be updated.

9.2.3 Set Auto Focus

Some device models support auto focus based on code position in the field of view.

Steps

1. Go to **Image Settings** → **Focus Param**.
2. Select **Whole Area Focus** as **Focus Mode Selector**. The whole area focus can achieve one-time lens focusing in the field of view.
3. Click  in the live view window to view, and then click  to stop acquisition. Currently, there is an image in the live view window.
4. Select **Auto and Restore** in **Auto Config**. During auto focus, the system will automatically adjust focus position and enable external light source, and then save the focus position only and restore all other parameters to previous settings upon completion.
5. Click **Execute** in **Auto Focus Start** to start focusing. The focus parameters cannot be set during auto focus, and become configurable upon completion. You can view focus status in **Focus Status**.
6. (Optional) Set **Focus Position**, and view position information in **Focus Position Param**.
7. (Optional) After lens focusing is finished, you can view the focusing score in **Idr Score**.
8. (Optional) Manually set focus length and step distance via Focus Step, **FocusPositive Execute**, **FocusNegative Execute**, and **OriginalFocus Execute**.

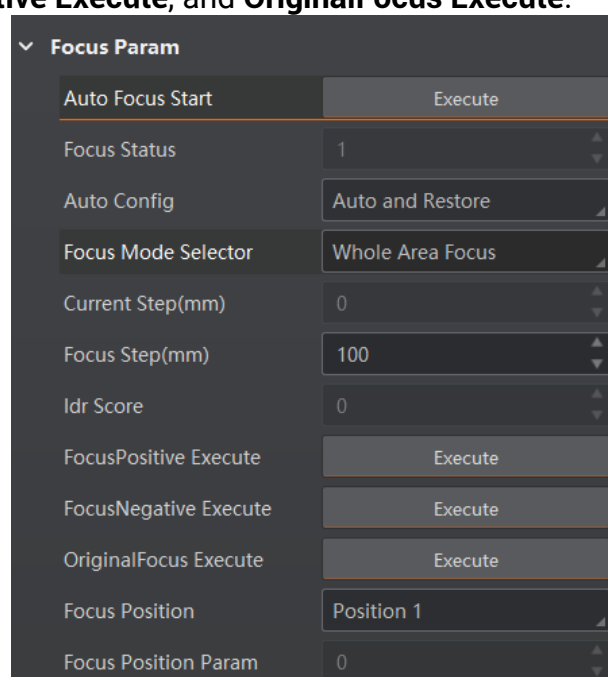


Figure 9-3 Set Auto Focus

9.2.4 Set Light Source

For devices with 10-pin green terminal and LED aimer, you can go to **Feature Tree** →

LightSource Control to set aimer-related parameters.

AimingLight Enable

Enable the aimer and set the related parameters.

AimingLight Open

Click **Execute** to open the aimer, and the aimer will emit a green LED horizontal line that allow the field-of-view to be clearly mapped to the desired target.

AimingLight Duration Time

It sets the minimum duration of the aimer and the unit is min.

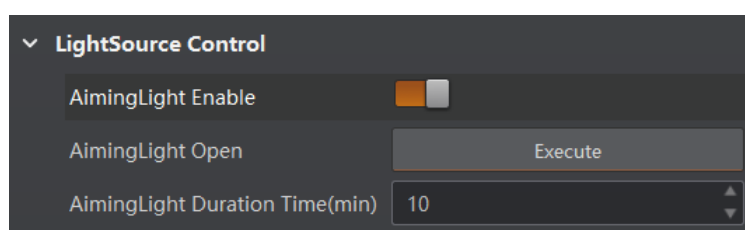


Figure 9-4 Set Aimer

9.2.5 Set Other Parameters

You can select other parameters in the **Image Settings**.

Note

The displayed parameters may differ by device model.

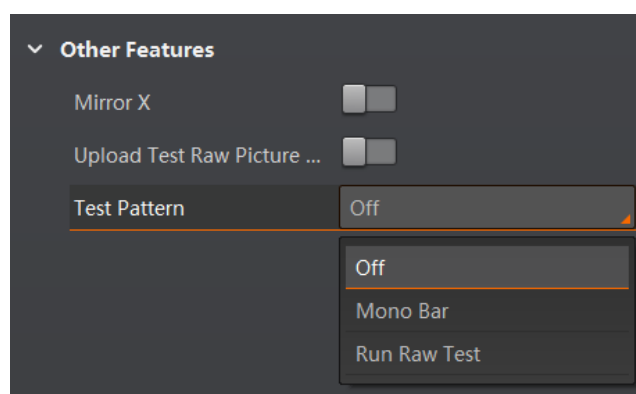


Figure 9-5 Set Other Parameters

Mirror X

If this function is enabled, the image will be reversed in a horizontal way. This function is enabled by default.

Test Pattern

Test pattern refers to the device's test images, and it is off by default. When exceptions occur in images acquired by the device in real time, you can check if images under the test pattern have similar problems to determine the cause of an exception.

SmoothMode

If this function is enabled, the acquisition frame rate will be increased. When the network is poor, it is recommended to disable the function, otherwise it may affect image quality.

Upload Test Raw Picture

If this function is enabled, the **Test Pattern** will be shown at the bottom of the interface. You can import test images in RAW and BMP formats to the directory of the device, add or delete the test images.

- Click  to import test images.
- Click  to import a file folder of test images.
- Click  to delete the selected test images.
- Click  to clear all test images.

Note

When **Run Raw Test** is selected as **Test Pattern** in **Other Features**, the test images cannot be deleted.



Figure 9-6 Test Image

9.3 Code Algorithm Settings

The device supports reading multiple types of 1D code and 2D code, 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.
-

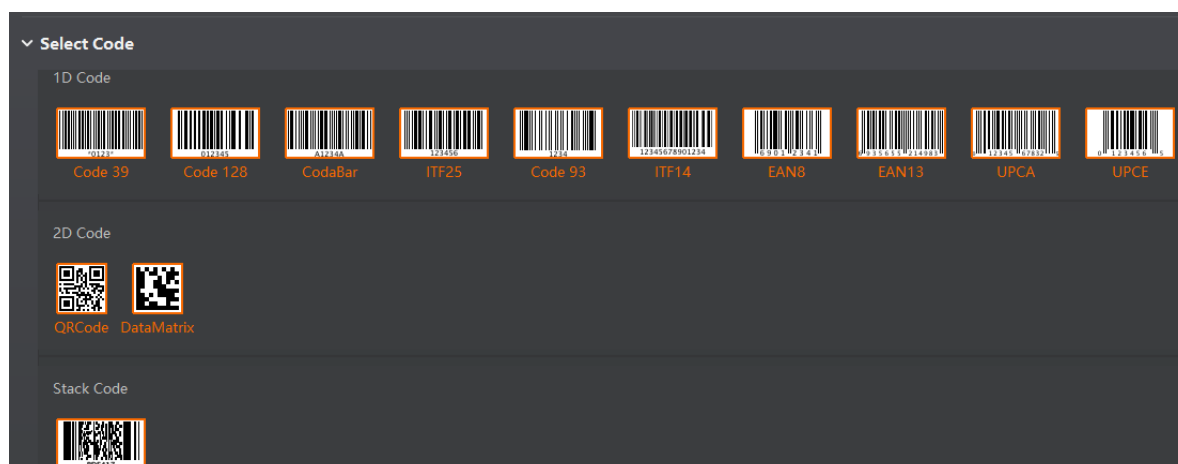


Figure 9-7 Select Code

9.3.2 Set Algorithm Parameter

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

Note

- You should have selected at least one type of 1D code, 2D code or stacked 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.

Algo Debug Info

If it is enabled, some key information in the algorithm process will be saved to the image file for troubleshooting of reading failure.

Note

When the function is enabled, all information will be saved, which takes up a large amount of memory. It is recommended to enable it only for troubleshooting.

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.

Algo Debug Info

If it is enabled, some key information in the algorithm process will be saved to the image file for troubleshooting of reading failure.

Note

When the function is enabled, all information will be saved, which takes up a large amount of memory. It is recommended to enable it only for troubleshooting.

Set Stack 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.

9.4 Signal Input Settings

9.4.1 Set Signal Input

The device supports free trigger mode, line trigger, frame trigger, and line + frame trigger.

Free Trigger Mode

In the free trigger mode, the device generates trigger signals by itself, and outputs images continuously in accordance with the configured frame rate.

Steps

1. Right click the device in the **Device Connection**, and click **Feature Tree**.
2. Go to **Trigger and IO Control** → **Trigger Selector**.
3. Set **Trigger Mode** as **Off** after selecting **Line Start** or **Frame Burst Start** as **Trigger Selector**.

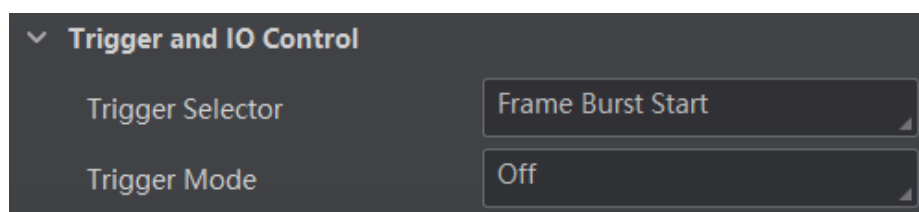


Figure 9-8 Free Trigger Mode

Frame Trigger Mode

Steps

1. Right click the device in the **Device Connection**, and click **Feature Tree**.
2. Go to **Trigger and IO Control** → **Trigger Selector**.
3. Set **Trigger Mode** as **On** after selecting **Frame Burst Start** as **Trigger Selector**.
4. Select **LineIn 0/1/2** as **Trigger In Source** according to actual demands.
5. Set **Start Delay Time** and **End Delay Time** according to actual demands.

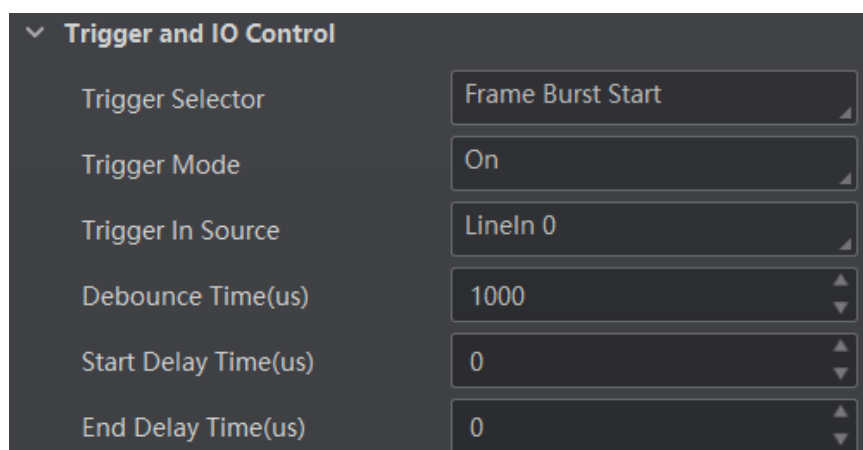


Figure 9-9 Frame Trigger Mode

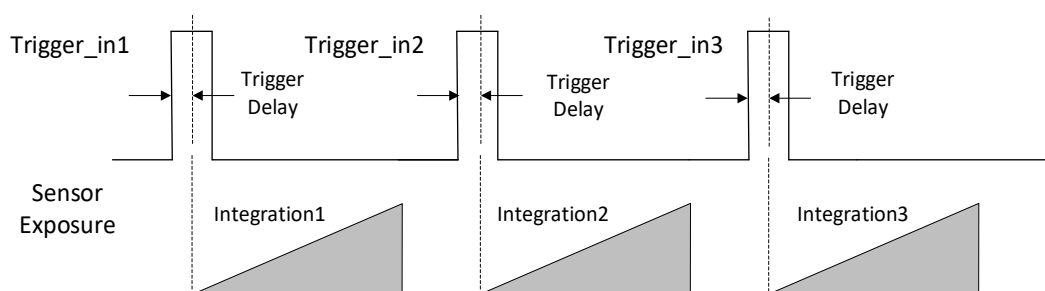


Figure 9-10 Trigger Delay Principle

Note

- For specific trigger sources, refer to the actual device you got.
- Trigger delay = time when parcel blocks the sensor + (end delay time - start delay time). The time when parcel blocks the sensor is determined by the length of the package and the speed of the conveyor belt.

6. Set **Debouncer Time** according to actual demands. 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.

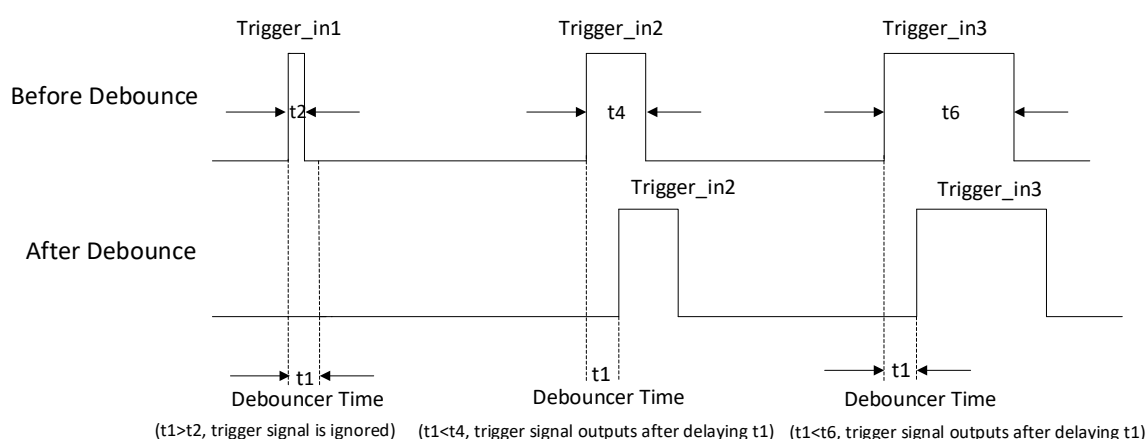


Figure 9-11 Debouncer Sequence Diagram

Note

If the configured debouncer time is larger than the pulse width of trigger signal, the trigger signal will be ignored. Otherwise, the trigger signal will be outputted after delay.

Line Trigger Mode

Steps

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

2. Go to **Trigger and IO Control** → **Trigger Selector**.
3. Set **Trigger Mode** as **On** after selecting **Line Start** as **Trigger Selector**.
4. Select **Trigger In Source** according to actual demands. You can select **LineIn 0/1/2, Encoder Module Out, or Frequency Converter**.

Note

For specific trigger sources, refer to the actual device you got.

5. Set **Trigger Delay** to ensure the normal recognition of the whole package.
6. Set **Debouncer Time** after selecting **LineIn *** as **Trigger Source**.

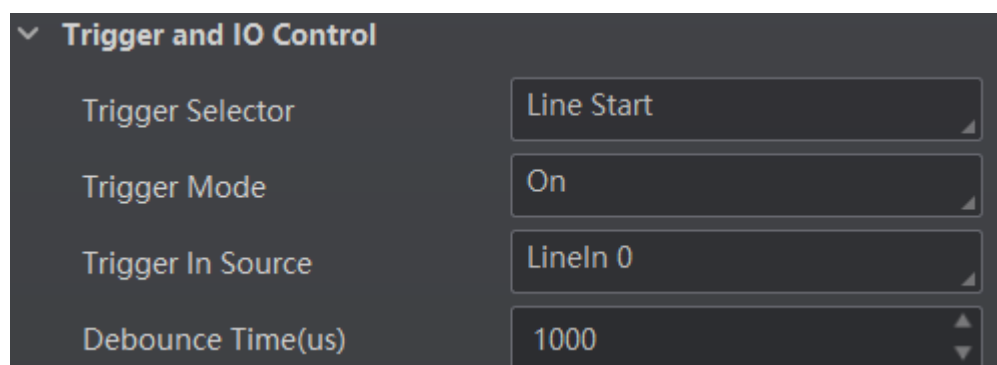


Figure 9-12 Set Debouncer Time

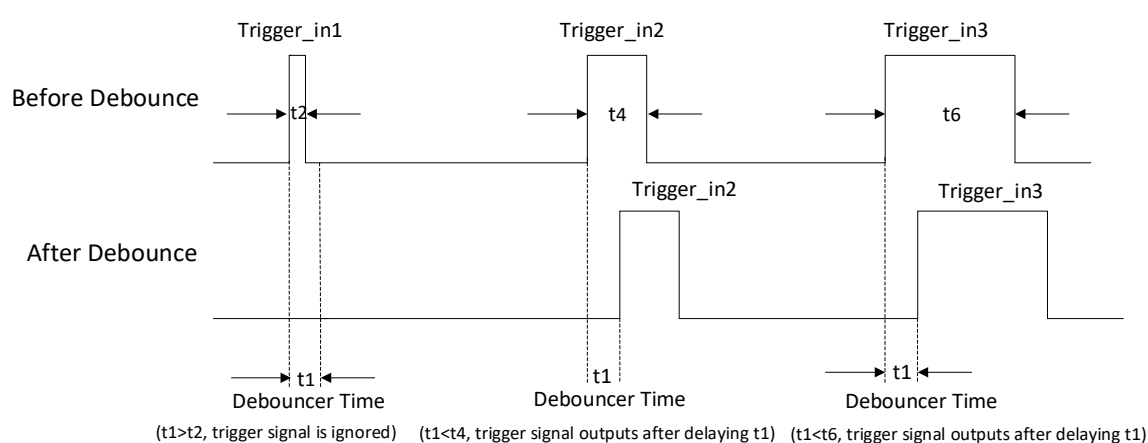


Figure 9-13 Debouncer Sequence Diagram

Note

If the configured debouncer time is larger than the pulse width of trigger signal, the trigger signal will be ignored. Otherwise, the trigger signal will be outputted after delay.

7. You need to set related parameters of shaft encoder control in **Encoder Control** after selecting **Encoder Module Out** as **Trigger In Source**. Refer to section **Set Shaft Encoder Control** for details.

8. You need to set related parameters of frequency converter control in **Frequency Converter Control** after selecting **Frequency Converter** as **Trigger In Source**. Refer to section **Set Frequency Converter Control** for details.

Line + Frame Trigger Mode

In this trigger mode, both line trigger and frame trigger are enabled. The device image acquisition is controlled by frame trigger signal and line trigger signal. The number of lines in a frame is controlled by the frame height register, and the line rate is controlled by the line trigger signal provided by external devices, and is also limited by the acquisition line rate. The line trigger signal only works after the device receives the frame trigger signal.

9.4.2 Set Shaft Encoder Control

The device supports shaft encoder control function that the device receives signal A and signal B with phase difference. After internal computing, the outputted signal of the shaft encoder can be used as device's trigger signal. The function demonstration of shaft encoder module is shown below.

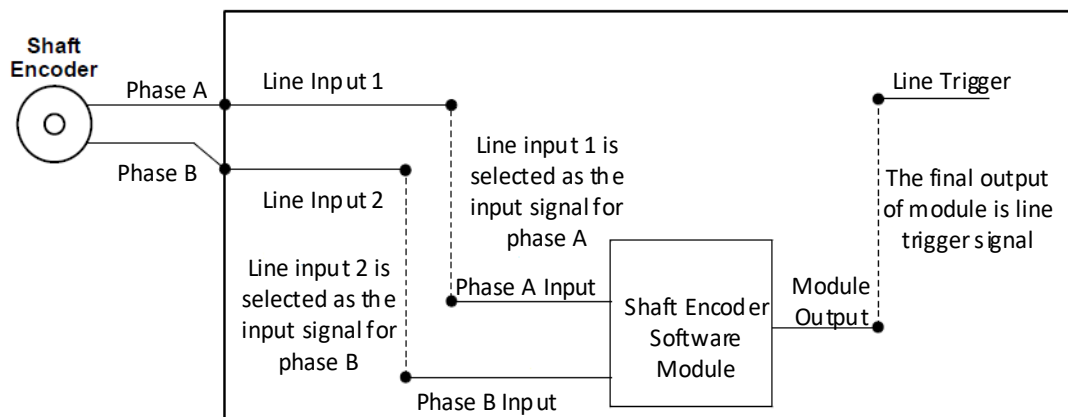
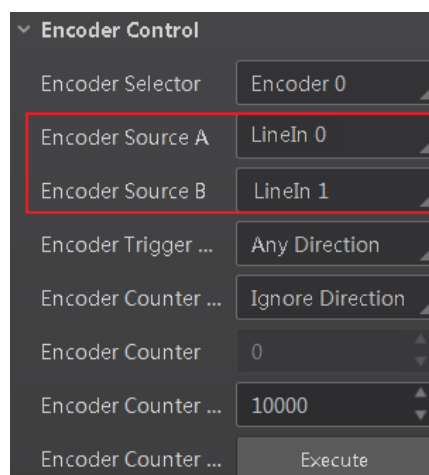


Figure 9-14 Function Demonstration

The advantages of shaft encoder are as follows:

- Encoder output pulse frequency is proportional to rotating speed.
- The output pulse acts as a trigger signal for the device.
- Synchronize acquisition speed and sample movement of device.
- Non-uniform motion can also be a perfect match.
- A trigger signal can be set as acquiring multiple lines or multiple frames with adjustable ratio.

You should go to **Encoder Control** to select the signal source of signal A and signal B via **Encoder Source A** and **Encoder Source B**.



Encoder Control	
Encoder Selector	Encoder 0
Encoder Source A	LineIn 0
Encoder Source B	LineIn 1
Encoder Trigger ...	Any Direction
Encoder Counter ...	Ignore Direction
Encoder Counter	0
Encoder Counter ...	10000
Encoder Counter ...	Execute

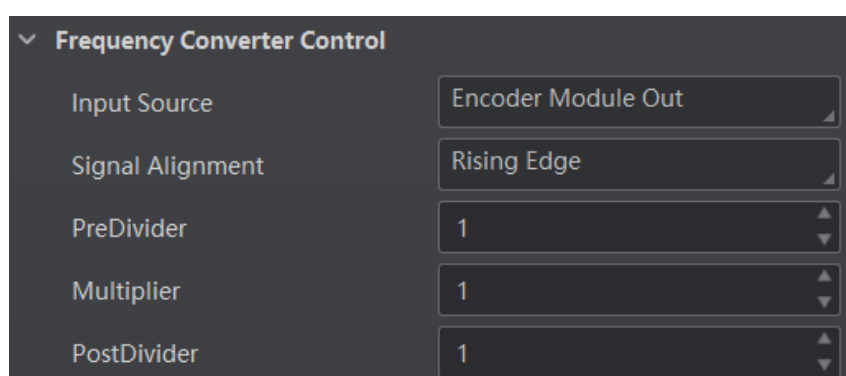
Figure 9-15 Set Encoder Source A and Encoder Source B

Note

- After selecting **Encoder Module Out** as the trigger source in line trigger mode, you can select LineIn0 or LineIn1 for **Encoder Source A** and **Encoder Source B** only. And you can select LineIn2 as the trigger source only in frame trigger.
 - For different models of the device, the specific parameters may differ, and the actual device you purchased shall prevail.
-

9.4.3 Set Frequency Converter Control

The device supports the frequency converter control function that allows the signal frequency of the trigger device to be different from required input signal frequency. Go to **Frequency Converter Control** → **Input Source**, and select the input source according to actual demands.



Frequency Converter Control	
Input Source	Encoder Module Out
Signal Alignment	Rising Edge
PreDivider	1
Multiplier	1
PostDivider	1

Figure 9-16 Set Frequency Converter Control

Note

- For specific input source, refer to the actual device you got.
-

The frequency converter module includes **PreDivider**, **Multiplier** and **PostDivider**. The signal after being processed by these 3 modules is the device's final trigger signal.

PreDivider

The input signal first enters the PreDivider module, which reduces source signal frequency via integer division, and then the signal is sent to the Multiplier module. The PreDivider module reduces periodic jitter on the input signal, and signals above 100 kHz must go through the PreDivider module to reduce the frequency for the Multiplier can only receive signals in the range of 10 Hz to 100 kHz frequency range. The periodic jitter of shaft encoder signal is accepted.

Multiplier

After the signal is processed by the PreDivider, it is sent to the Multiplier. The Multiplier multiplies the signal by an integer to increase its signal frequency, and then the signal is sent to the PostDivider.

Parameter can be set as rising or falling edge. If a rising edge is set, each rising edge of the signal coming from the PreDivider will be locked to match the signal of the rising edge, and vice versa. During this process, make sure do not increase signal frequency via too larger multipliers to avoid trigger signal frequency beyond the max. line rate of the device. Even if a smaller multiplier is selected, an excessively high frequency may be generated in the frequency adjustment, exceeding the max. line rate of the device.

PostDivider

PostDivider reduces signal frequency via an integer factor, and uses the newly generated frequency signal as the device's trigger signal.

9.5 Signal Output Settings

9.5.1 Select Output Signal

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

Note

- The specific output signals may differ by device models.
 - The LineOut2 cannot be used as the output signal because it is the output port of controlling light source mode.
-

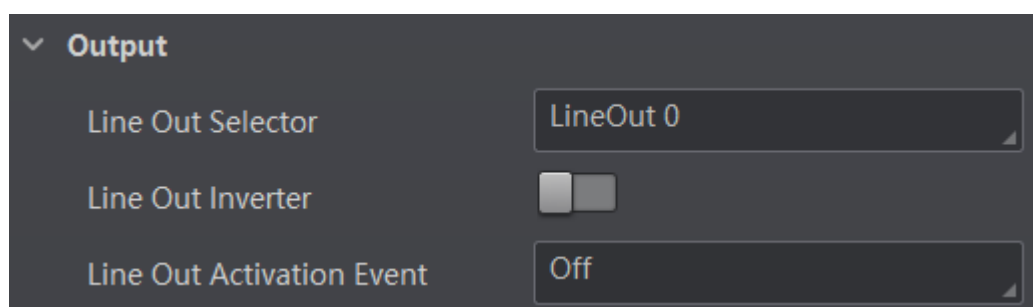


Figure 9-17 Select Output Signal

9.5.2 Set Event Source

Note

The event source parameters may differ by device model.

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

The device supports following event sources.

Note

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

Select Acquisition Start Active

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

- **Line Out Delay Time:** It sets the delay time for outputting the output signal.
- **Line Out Duration:** It sets the time duration of the output signal.

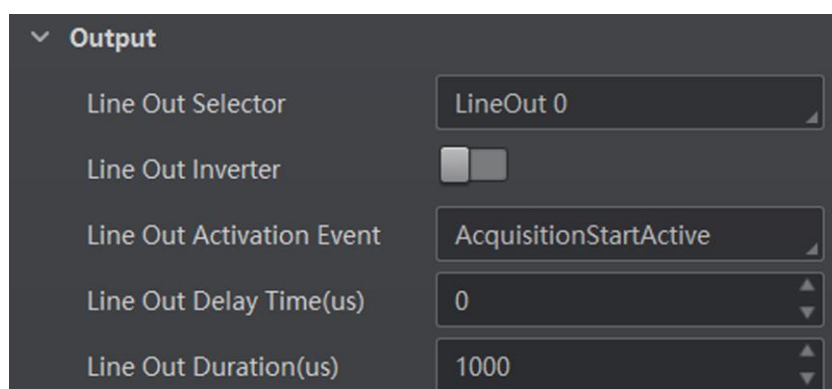


Figure 9-18 Select Acquisition Start Active

Select Acquisition Stop Active

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

- **Line Out Delay Time:** It sets the delay time for outputting the output signal.
- **Line Out Duration:** It sets the time duration of the output signal.

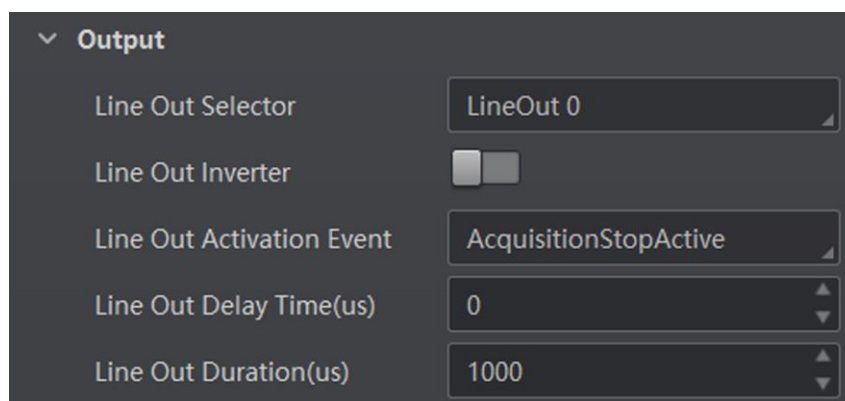


Figure 9-19 Select Acquisition Stop Active

Select Exposure Start Active

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

- **Line Out Delay Time:** It sets the delay time for outputting the output signal.
- **Line Out Duration Time:** It sets the time duration of the output signal.
- **LineOut Ahead Time:** It sets the advance time of outputting the output signal.

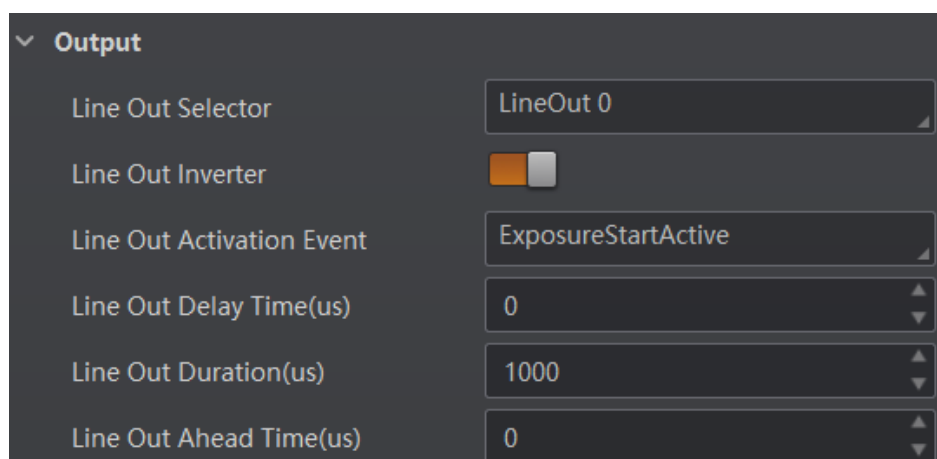


Figure 9-20 Select Exposure Start Active

Select Soft Trigger Active

If you select **SoftTriggerActive** as **Line Out Activation Event**, you can set its output delay

time, duration, and execute outputting signal manually.

- **Line Trigger Software:** Click **Execute** in **Line Trigger Software** to output the signal manually.
- **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.

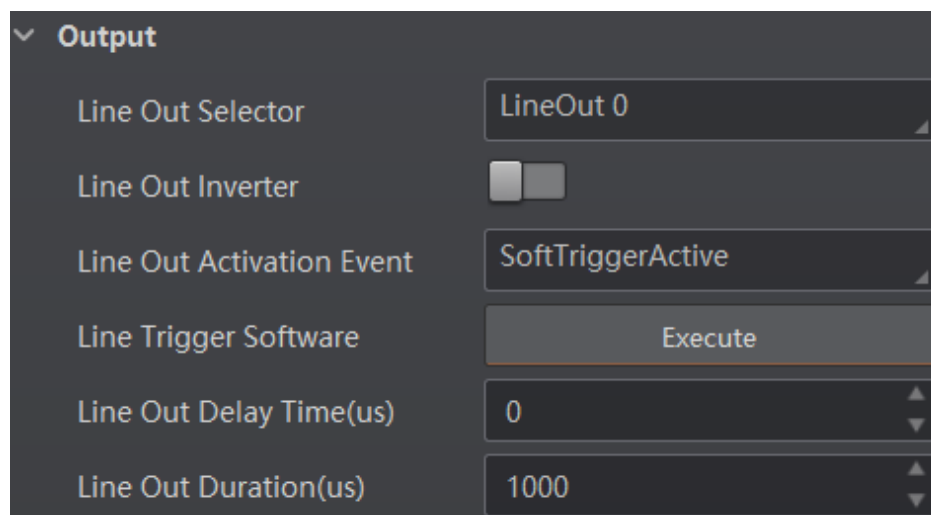


Figure 9-21 Select Soft Trigger Active

Select Timer Active

If you select **TimerActive** as **Line Out Activation Event**, you can set its output duration and period.

- **Line Out Duration:** It sets the time duration of the output signal.
- **Line Out Period:** It sets the time period of the output signal.

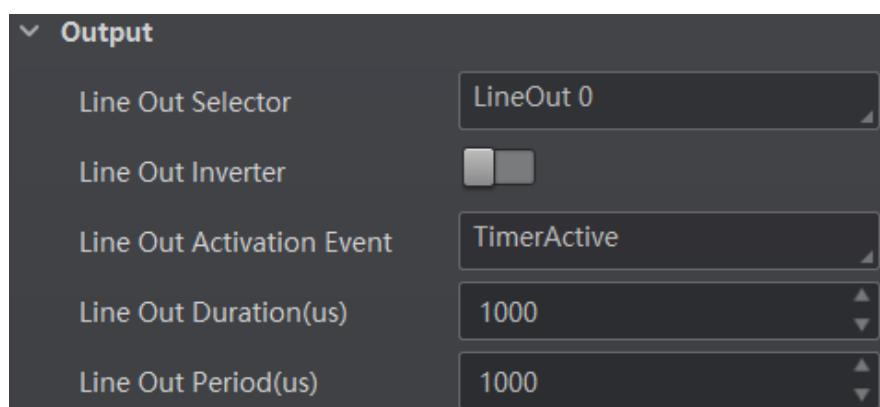


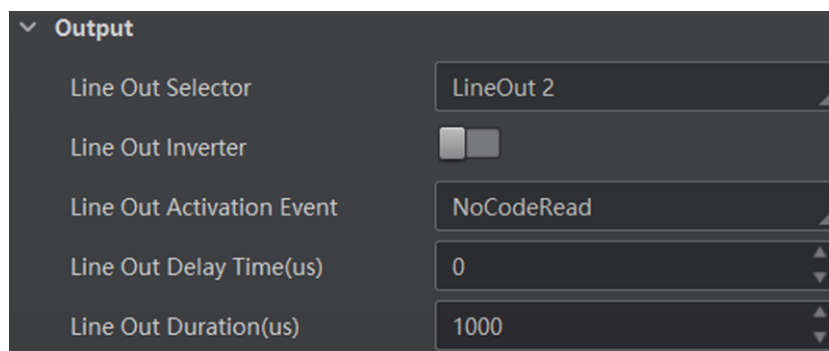
Figure 9-22 Select Timer Active

Select No Code Read

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

and duration.

- **Line Out Delay Time:** It sets the delay time for outputting the output signal.
- **Line Out Duration:** It sets the time duration of the output signal.



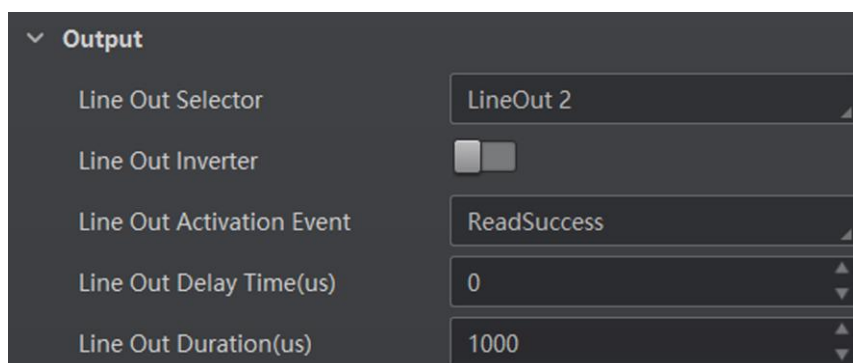
The screenshot shows a configuration window titled 'Output' with a dropdown arrow. It contains five settings: 'Line Out Selector' is set to 'LineOut 2'; 'Line Out Inverter' is a toggle switch currently turned off; 'Line Out Activation Event' is set to 'NoCodeRead'; 'Line Out Delay Time(us)' is set to '0'; and 'Line Out Duration(us)' is set to '1000'.

Figure 9-23 Select No Code Read

Select Read Success

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

- **Line Out Delay Time:** It sets the delay time for outputting the output signal.
- **Line Out Duration:** It sets the time duration of the output signal.



The screenshot shows the same configuration window as Figure 9-23, but with 'Line Out Activation Event' set to 'ReadSuccess'. All other settings remain the same: 'Line Out Selector' is 'LineOut 2', 'Line Out Inverter' is off, 'Line Out Delay Time(us)' is '0', and 'Line Out Duration(us)' is '1000'.

Figure 9-24 Select Read Success

Select Light Strobe Long

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

9.5.3 Enable Line Inverter

The line inverter function allows the device to invert the electrical signal level of an I/O signal,

and meet requirements of different devices for high or low electrical signal level. You can go to **I/O Control Settings** → **Output**, and enable **Line Out Inverter**.

Note

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

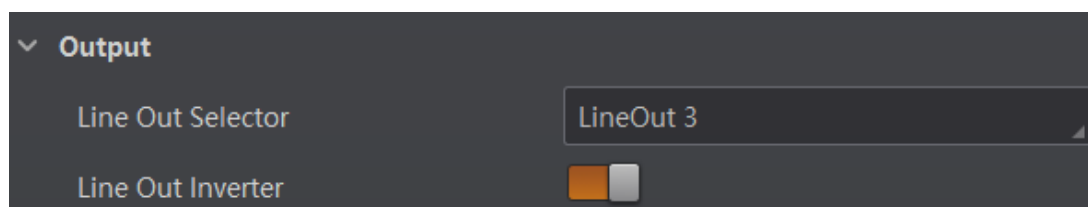


Figure 9-25 Enable Line Out Inverter

9.6 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**, it only supports **SmartSDK** protocol and no parameter settings are required.
 - If the device's running mode is **Normal**, it supports **SmartSDK**, **TCP Client**, **Serial**, **FTP**, **TCP Server**, and **UDP** communication protocols, and you need to set corresponding parameters.
-

Note

- The supported communication protocols may differ by device models.
 - 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.
-

9.6.1 Set Smart SDK

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

Table 9-3 SmartSDK Communication Protocol

Parameter	Description
SmartSDK Protocol	If enabled, the device will output data via SmartSDK.
Encode JPEG Flag	The device will compress images in JPG format after enabling it.

Parameter	Description
Quantity of JPG	It sets the image compression quality, and it ranges from 50 to 99.

9.6.2 Set TCP Client

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

Table 9-4 TCP Client Communication Protocol

Parameter	Description
Output Result Buffer	If it is 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 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.

9.6.3 Set Serial

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

Table 9-5 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.

9.6.4 Set FTP

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

Table 9-6 FTP Communication Protocol

Parameter	Description
Output Result Buffer	If it is 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.
FTP Host Port	Port No. of the FTP host.
FTP User Name	User name of the FTP.
FTP User PWD	Password of the FTP.

9.6.5 Set TCP Server

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

Table 9-7 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 output by code reader.

9.6.6 Set UDP

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

Table 9-8 UDP Communication Protocol

Parameter	Description
UDP Protocol Enable	If enabled, the code reader will output data via User Datagram Protocol (UDP).

Parameter	Description
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.

9.7 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.

9.7.1 Set Filter Rule

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

- **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 enabled, the device will only parse and read the numeral contents of the codes, and the non-numeral contents will be filtered out.
- **CodeLen Max Num:** It 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:** enabled, the device will only read the codes which begin with a specific character string.
- **Begins with:** Enter the character string.
- **Include Specific Character in Barcode:** If enabled, the device will only read the codes which include a specific character string.
- **Character:** Enter the character string.
- **Exclude Specific Character in Barcode:** If enabled, the device will only read the codes without a specific character string.
- **Character:** Enter the character string.
- **Regular Expression Filter Enable:** If it is enabled, the device will only read the codes which contain the configured character string(s).
- **NoRead TimeOut:** If no codes are not recognized after the time you set here, the client software will output NoRead instead.
- **Read Times Threshold:** If the reading results of a 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.

Note

The parameters, such as **Instant Output Mode Enable**, **Min. Output Time**, **CodeLen Max Num**, and **Code Offset Num**, are only available when the running mode is set to Normal mode and the trigger mode is enabled.

9.7.2 Set Result Format

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

Note

- The actual parameters displayed may vary with different communication protocols. For details about communication settings, refer to section [Communication Settings](#).
 - The specific parameters and parameter order may differ by the device's running mode, trigger mode, device models and firmware versions.
-

SmartSDK

When the communication protocol is **SmartSDK**, you just need to set **NoRead Image Index** in the **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.

TCP Client / TCP Server / Serial

When the communication protocol is TCP Client, Serial, or TCP Server, set the following parameters of data processing.

Note

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

- **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 Barcode Name Enable:** If this parameter is enabled, the outputted code information will contain the name of the code.
 - ***** Output Barcode Position Enable:** If this parameter is enabled, the outputted code information will contain the position of the code.
 - ***** Output Barcode Angle Enable:** If this parameter is enabled, the outputted code information will contain the angle of the code.
 - ***** Output Barcode MainPackageID Enable:** If this parameter is enabled, the outputted barcode information will contain the package ID.
 - ***** Output NoRead Enable:** If this parameter is enabled, when no code is recognized, the device will output the content you set in **TCP Output NoRead Text**.
 - ***** Output NoRead Text:** When no code is recognized, the device will output the content you set here.
-

Note

The default content is **NoRead**.

- ***** Output Start Text:** The contents of the start part of the data outputted. You can set the contents according to actual condition.
- ***** Output Stop Text:** The contents of the end part of the data outputted. You can set the contents according to actual condition.
- ***** Output TCP Delimiter:** It refers to the delimiter that separates code name, position, angle, package ID, etc. You can set it according to actual condition.

FTP

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

- **FTP Picture Name Format:** Click **Edit** to edit the output format of FTP picture name.
-

Note

You can select the formats or enter the formats in the preview box.

- **FTP Upload Directory String:** Click  to select device IP, Image, Year, Month, and Day.
- **FTP Upload Directory:** View the configured FTP upload directory. Data are separated by "/".

- **FTP Picture OK/NG Directory:** After the function is enabled, the reading-succeeded pictures are saved in OK directory, and the reading-failed pictures saved in NG directory.

Note

If the function is disabled, all pictures are saved in one directory.

- **Local Save Picture Mode:** It includes **Off** and **NoRead**. You can select **NoRead** to let the device save images when no code is read.
- **Local Picture Type:** It sets the image saving type, including JPEG and BMP.
- **Local Override Strategy:** It includes **Off**, **Max Count**, **Loop Max Count**, and **Reserve Space**.
 - **Off** means that disk will not be overridden.
 - **Max Count** means that the device will save image quantity configured in **Local Override Max. Count**, and no more imaged will be saved when the disk is full.
 - **Loop Max Count** means that after the image quantity is reached the number configured in **Local Override Max. Count**, the device will delete the first image and continue to save the latest image.
 - **Reserve Space** means that the device will save images when the disk is safe in terms of storage space. If the available disk space is lower than configured value, and images will be deleted.
- **Local Override Max. Count:** You need to set this parameter when selecting **Max Count** or **Loop Max Count** as **Local Override Strategy**.
- **Local Picture Name Content:** It selects what contents you want to display in file name, including frame time, trigger No., and frame No.
- **Local Time Format:** It selects a format type from the drop-down list for the time stamp contained in the file name. Take YYYYMMDD_HHMMSSFFF as an example, (from the left to the right) YYYY represents year, MM represents month, DD represents date, HH represents hour, MM represents minute, SS represents second, and FFF represents millisecond.
- **Local Save Picture Strategy:** It sets the picture saving method. Four methods are available, including recently frame, all frames, range frames and specific frame. If specific frame is selected as **Local Save Picture Strategy**, you need to set **Local Picture Index**.
- **Output Retrans Enable:** If this parameter is enabled, the data is allowed to retransmit to FTP server, and you should set specific value in **Output Retrans Number**.

Note

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

- **FTP Transmission Conditions:** It sets the condition to upload the data outputted by the device to FTP server.
 - **All** refers to upload the data always.
 - **Read Barcode** refers to upload the data only when the barcode is read by the device.
 - **No Read Barcode** refers to upload the data only when no barcode is read by the

device.

- **FTP Transmission Result Contain:** It selects contents to upload to the FTP server.
 - **Just Result** refers to only upload the content of the barcode.
 - **Just Picture** refers to only upload the barcode picture.
 - **Result and Picture** refers to upload both the content of the barcode and the picture.
- **FTP File Format:** It includes CSV, XLS, and TXT.
- **FTP File Content Configuration:** You can set FTP file content. Barcode type, trigger number, frame number, code reading time, and code reading content can be selected.
- **FTP Result File Content Configuration:** You can set FTP result file content. The <frame_num>, <trigger_num>, and <ftp_code_content> can be configured by default.
- **FTP NoRead String:** The string is output during NoRead customization, None by default.
- **FTP Time Format:** It selects a format type from the drop-down list for the time stamp contained in the file name. Take YYYYMMDD_HHMMSSFFF as an example, (from the left to the right) YYYY represents year, MM represents month, DD represents date, HH represents hour, MM represents minute, SS represents second, and FFF represents millisecond.
- **FTP Save Picture Strategy:** It sets the FTP picture saving method when no code is read. Four methods are available, including recently frame, all frames, range frames and specific frame. If specific frame is selected as **FTP Save Picture Strategy**, you need to set **FTP Picture Index**.
- **FTP Picture Index:** In a complete trigger process, if the barcode cannot be recognized, this parameter can be used to decide to output the image. When the parameter is set to n, the nth image is output if the number of images is no less than n, or the last image is output if the number of images is less than n.
- **Sorting Rules:** It decides the output order of codes, and you can select it according to actual demands.
- **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.
- **FTP NoRead Picture Classification:** You can select **WholeFrame** or **SingleFrame**.

9.8 User Set Customization

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

Click  on the toolbar to add/load/delete user set.

- **Saving Settings:** If you have set the device parameters as desired, you can save them into the user set. Go to **Param Save**, and click **User Set1/2/3** to save the current device settings.
- **Loading Settings:** You can load the user set to restore the device to the saved group of parameter values again if required. Go to **Param Save**, and click **Default** or **User**

Set1/2/3 to load settings.

Note

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

- **Adding/Deleting Settings:** You can click  to add user set. Up to 8 user sets can be added.
You can select the user set to delete. **Default** or **User Set1/2/3** cannot be deleted.
- **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.

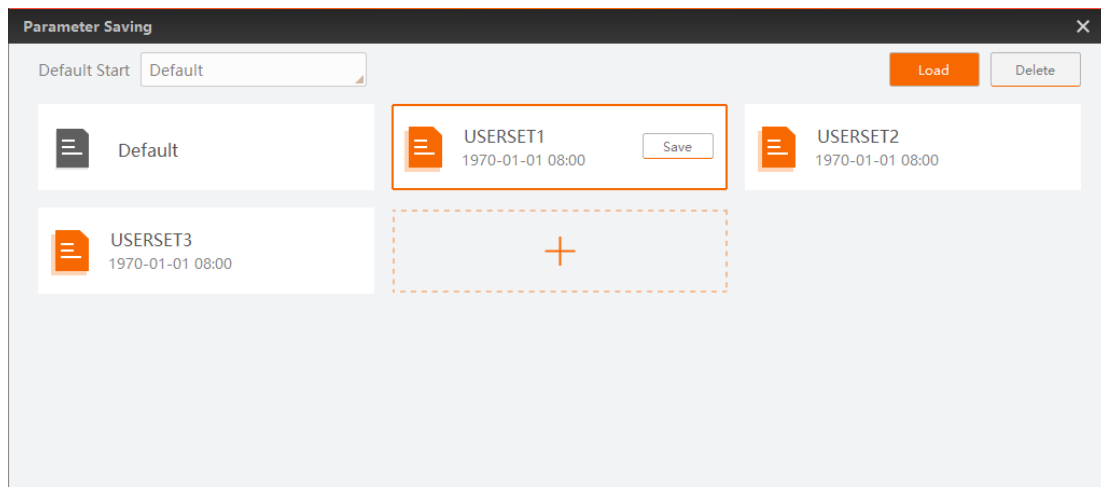
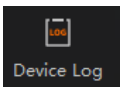


Figure 9-26 User Set Customization

Chapter 10 Device Maintenance

10.1 View Log

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

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

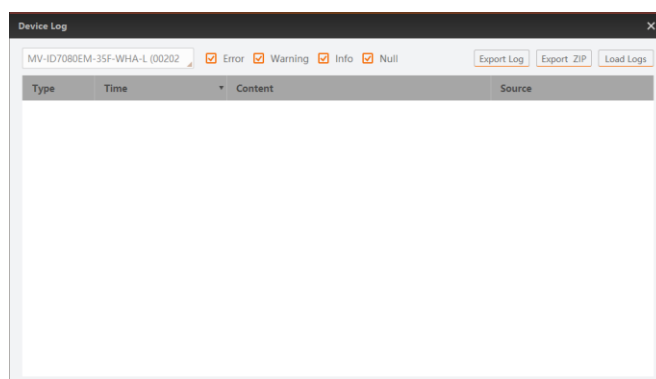


Figure 10-1 View Log

10.2 Update Firmware

There are two methods for firmware update.

Update via UDP

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 restart automatically after the firmware is updated successfully.

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

Note

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

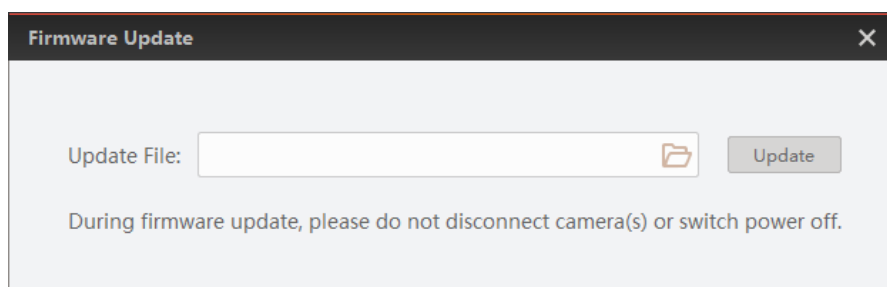


Figure 10-2 Update Firmware via UDP

Update via TCP

Note

Connect the device to client software first.

Select the device to be updated in the device list, right-click the device, and click **Firmware Update**. Click  to select update file from local PC, enter port No. of TCP update, and click **Update** to update firmware.

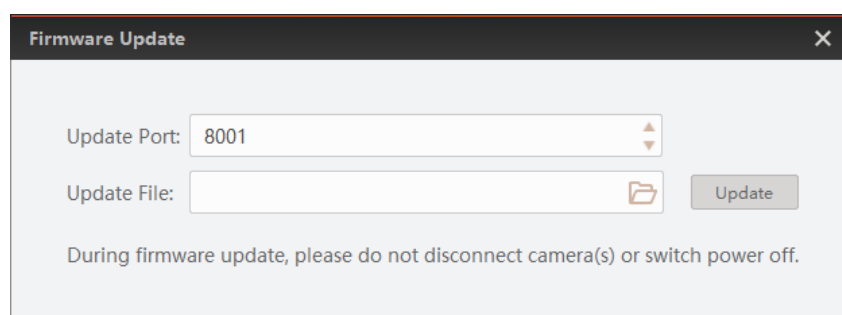


Figure 10-3 Update Firmware via TCP

10.3 Set NTP Time Sync

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

Steps

1. Go to **Device Control**, and enable **NTP Timing**.
2. Set parameters according to actual demands.

Note

Configure NTP server settings before using NTP time synchronization function.

3. Click **OK** after settings.

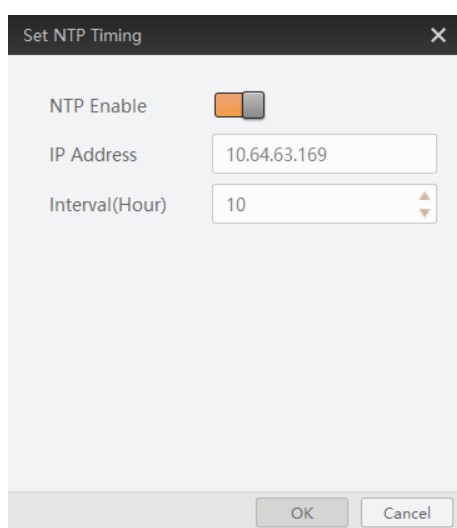


Figure 10-4 Set NTP Timing

10.4 Restart Device

You can restart the device via client software. Go to **Device Control**, and click **Device Reset**.

This section introduces some basic device operations about how to start acquisition and recording, view reports, etc.

Note

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

10.5 Set Reflector

After an electric brush reflector is connected to the device, you can execute reflector cleaning via **Reflective Mirror Control**.

Before You Start

Make sure that the electric brush reflector is connected to the device.

Note

The connection between the device and the electric brush reflector is achieved via serial port. Therefore, you should enable **Serial Protocol** in **Communication Protocol**, and set **Serial Baudrate** as 115200.

Steps

1. Go to **Feature Tree** → **Reflective Mirror Control**.
2. Enable **Reflective Mirror Control Enable**.
3. Click **Execute** in **Reflective Mirror Cleaning Start** to start reflector cleaning. And you can set the cleaning times performed by the cleaning brush during each cleanup via **Reflective Mirror Cleaning Period**.
4. (Optional) Click **Execute** in **Reflective Mirror Cleaning Stop** to stop reflector cleaning.
5. Click **Execute** in **Reflective Mirror Close** to close reflector.
6. (Optional) You can enable **Reflective Mirror Cleaning Timing Enable**, select a time point in **Reflective Mirror Cleaning Timing**, and set cleaning times via **Reflective Mirror Cleaning Period**.

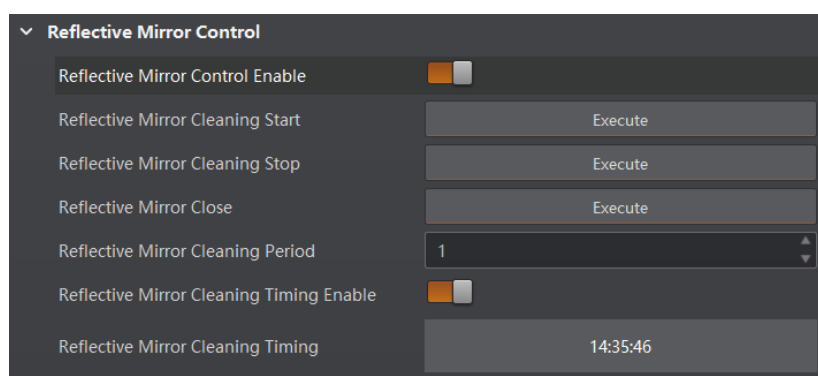


Figure 10-5 Set Reflector

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 power connection (observe whether the indicator is solid blue or not) to make sure the device is powered up normally.
Network exception occurs.	Check the network connection to make sure that the device can be connected to the network normally. PC port 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 supplement light due to the small distance between conveyer belts.	Increase the distance between conveyer belts. It is recommended to have the distance of 30 mm at least.

11.3 Why the image quality is very poor during the live view?

Table 11-3 Question 3

Possible Cause	Solution
The network may be Fast Ethernet.	Confirm whether the network transmission speed is 1 Gbps and NIC is the gigabit NIC, etc.
Incorrect jumbo packet settings.	Set jumbo packet value as 9 KB, or 9014 bytes.

11.4 Why there is no image in the live view?

Table 11-4 Question 4

Possible Cause	Solution
Trigger mode is enabled, but there is no trigger signal.	Send the trigger signal to the device, or disable the trigger mode.
Incorrect running mode settings, and no codes are recognized within the field of view.	Set the running mode as the test mode.

11.5 Why the recognized codes are opposite in direction with actual ones?

Table 11-5 Question 5

Possible Cause	Solution
Inconsistency between TDI Direction settings and the running direction of the conveyor belt and the direction that device captures images.	Go to Feature Tree → Image Settings → TDI Direction , and set the TDI Direction according to actual demands. If the running direction of the conveyor belt is the same with the direction that device captures images, and select Forward Direction as TDI Direction . Otherwise, select Backward Direction as TDI Direction .

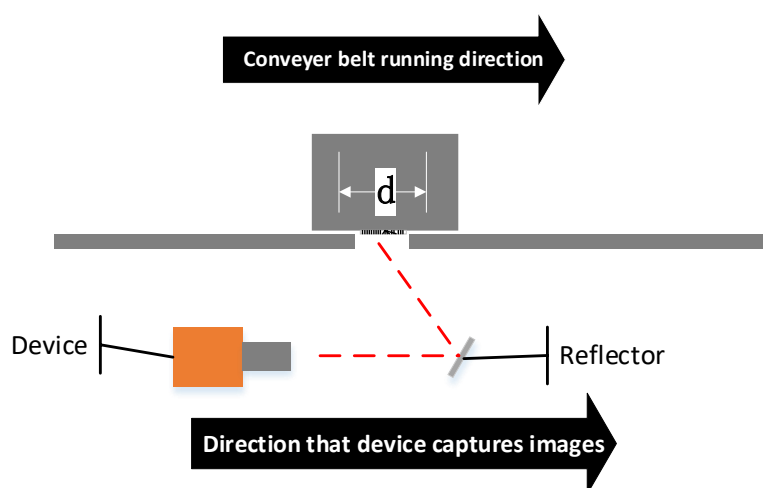


Figure 11-1 Same Direction

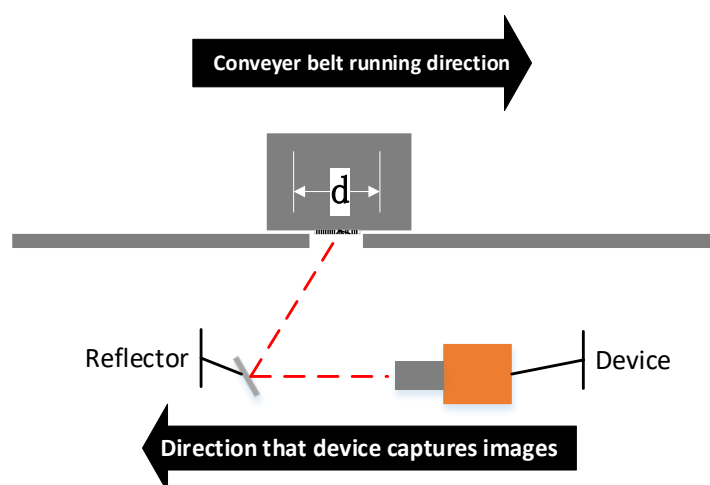


Figure 11-2 Opposite Direction

11.6 Why codes within the field of view cannot be recognized?

Table 11-6 Question 6

Possible Cause	Solution
Correct code types are not selected in the Algorithm Settings .	Go to Algorithm Settings , and select different types of codes according to actual demands.

11.7 How to adjust focal length for code reading?

Table 11-7 Question 7

Possible Cause	Solution
The static debugging of the device is very inconvenient because the image acquisition is in a dynamic way. Besides, regarding code recognition, the code definition requirements of different mills are also different.	Find three codes that need to be recognized (codes with the lowest density), and place codes facing down on the left, middle, and right of the conveyor (codes placed horizontally). At this time, these codes can also be seen in the static preview of the device. Adjust focal length to make sure that three images can be clearly distinguished. Tighten screws after adjusting the focal length.

11.8 Why the recognized codes are incomplete?

Table 11-8 Question 8

Possible Cause	Solution
Number of codes exceeds the limit.	Go to Algorithm Settings to reset the number of codes.
Numeral Filter is enabled.	Go to Data Processing → Filter Rule to disable the Numeral Filter function.
The code length is limited.	Go to Data Processing → Filter Rule to edit the code length.

Chapter 12 Revision History

Table 12-1 Revision History

Version No.	Date	Revision Details
V2.6.1	Mar. 27, 2026	• Edit Chapter Appearance, delete the product appearances not available overseas.
V2.6.0	Aug. 1, 2025	• Edit Chapter Appearance. • Add Section Set Auto Line Rate. • Add Section Set Auto Focus. • Add Section Set Reflector.



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