Industrial Code Reader
User Manual
DM-JxxP

V2.5.6, Jun. 2025

Preface

Preface

Purpose

This Manual is a basic description of industrial code reader, which mainly includes the product description, quick installation guide and Simple introduction of SDK(DM-Datum). This manual may be updated due to product upgrades or other reasons. If you need, please contact the sales engineer for the latest version of this manual.

Copyright ©2024
Hangzhou Contrastech Co., Ltd.
Tel.: +86 571-89712238
Add.:No. 8 Xiyuan 9th Road, West Lake District Hangzhou Zhejiang 310030 China.

Disclaimer

The information and specifications described in this manual are subject to change without notice.

Latest Manual Version

For the latest version of this manual, see the Download Center on our web site at: https://www.contrastech.com/en/service/005001.html

Technical Support

For technical support, e-mail：support@contrastech.com.

Warranty

To ensure that your warranty remains in force, adhere to the following guidelines:

Do not remove the camera's serial number label
If the label is removed and the serial number can't be read from the camera's registers, the warranty is void.

Do not open the camera housing
Do not open the housing. Touching internal components may damage them.

Prevent ingress or insertion of foreign substances into the camera housing
Prevent liquid, flammable, or metallic substances from entering the camera housing. If operated with any foreign substances inside, the camera may fail or cause a fire.

Avoid electromagnetic fields
Do not operate the camera in the vicinity of strong electromagnetic fields. Avoid electrostatic charging.

Clean with care
Avoid cleaning the sensor if possible.

Handle this camera with care
Do not abuse the camera. Avoid striking, shaking, etc. The camera could be damaged by improper handling.

Read the manual
Read the manual carefully before using the camera.

1

CHAPTER 1   # PRODUCT DESCRIPTION

Product Introduction

The code reader mentioned in this manual integrates image acquisition, bar code recognition and output functions, can efficiently read 1D codes and 2D codes in a variety of code systems, and has a compact and compact structure, suitable for 3C, food and medicine, electronic semiconductors, new energy and other industries.

The device uses sensors and optical components to obtain images of the measured object, and realizes barcode analysis through the built-in deep learning code reading algorithm of the device. The device can also output inspection results through a variety of communication methods.

Product Features

■ Adopts built-in deep learning algorithm to read codes with good robustness.

■ Adopts CMOS sensor to acquire image data and provide high-quality image.

■ A single cable provides multiple IO interfaces for input and output signals.

■ Supports top and double side indicators displaying device status.

■ Adopts external waterproof debugging button, support external manual trigger

■ Modular light source design, which is easy to switch

■ IP67 protection,can be widely used in various industrial scenarios.

＊ For technical parameters, please refer to the technical specifications of the model..

＊ The camera functions may differ by camera models,please refer to actual functions.

Status LED Description

Status LED	Description
OK/NG Indicator	It indicates code reading result. ● The indicator is orange when the device is starting up. ● The indicator is red after the device is powered on. ● The indicator is flashing green after the device reads barcodes, and it is solid green if the device reads barcodes continuously.
Device Status Indicator	STS Indicator, The indicator is green when the device operates normally. When the device starts up or exception occurs, it is red.
Power Indicator	PWR Indicator, The indicator is green when the device operates normally. Otherwise, it is red.

Mechanical Dimensions

The dimensions is in millimeters:

The code reader are secured via M4 size screw located on the back of the housing.
The 17-pin M12 interface provides power, input/output, Ethernet, and serial port signal, and the threaded interface reduces loosening caused by vibrations.
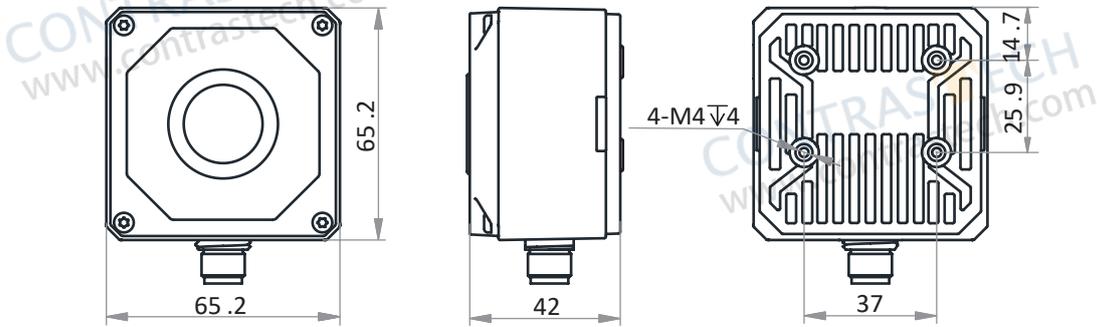
Camera Housing and Base Mounting Hole Size(mm):

Fig. 1-1: Mechanical Dimensions (in mm) of the Four-way light source code reader with 65.2 * 65.2 * 42 mm housing (Built-in 8 LED lamps).
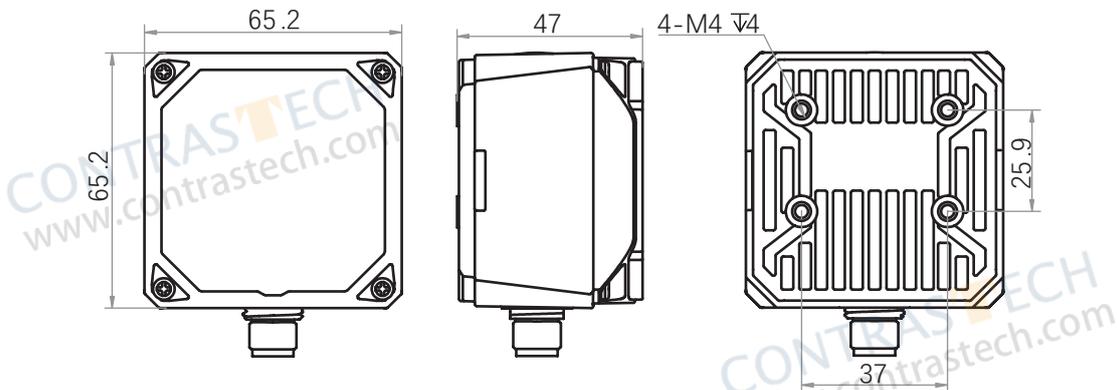
Fig. 1-2: Mechanical Dimensions (in mm) of the Six-way light source code reader with 65.2 * 65.2 * 47 mm housing(Built-in 14 LED lamps).

■ Focus Knob

It is used to adjust focal length manually.

i	The focus knob may differ by device models, and some models do not have a focus knob.

■ Lens Cap

It can be replaced with other lens cap. Refer to the device's specification for details.

■ Light Source

It refers to LED lamps providing light for improving code reading effect.

● The default color of LED lamps is white. Red, blue and IR are optional.

● The quantity of LED lamps may differ by device models.

■ Button

_When the device is in continuous acquisition mode, press the button and the device enters trigger mode.
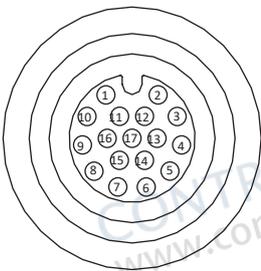
_When the device is in trigger mode, press the button and the device triggers once.

2

POWER AND
I/O IENTERFACE DEFINITION

CHAPTER 2

I/O Connection Definition and Assignments

It provides power, input/output, Ethernet, and serial port signal. Read the followings to get pin definitions.Refer to the pin definitions and labels attached to the cable to wire the device.

17-pin M12 Connector:

Color		Pin	Signal	Signal Source	Designation
Red		1	POWER_IN	-	Direct current power supply positive
Brown		2	DO_5	LineOut5 signal line	Non-isolated Output
Purple	White	3	OUT_R	-	Configure as pull-up/pull-down resistor for output
Green		4	RS-232 TX	-	RS-232 serial port output
Green	White	5	RS-232 RX	-	RS-232 serial port input
Yellow		6	MDI0+	-	Fast Ethernet signal MDI0+
Brown	White	7	MDI1-	-	Fast Ethernet signal MDI1-
Blue	White	8	DO_3	LineOut3 signal line	Non-isolated Output
Blue		9	DI_2	LineIn2 signal line	Non-isolated Input
Brown	White	10	DO_4	LineOut4 signal line	Non-isolated Output
Black		11	GND	Signal ground	Direct current power supply negative
Pink		12	IN_R	-	Configure as pull-up/pull-down resistor for output
Purple		13	-	-	-
Yellow	White	14	MDI0-	-	Fast Ethernet signal MDI0-
Orange		15	MDI1+	-	Fast Ethernet signal MDI1+
Gray		16	DI_0	LineIn0 signal line	Non-isolated Input
White		17	DI_1	LineIn1 signal line	Non-isolated Input

ℹ️ ● You should refer to the table above and the label attached to the supplied 17-pin cable to wire the device.
● Some devices due to different firmware versions may have output signal source of LineOut0/1/2. Refer to the device you purchased for actual conditions.

The I/O definitions in this manual apply only to ContrasTech standard cables for DM-Datum cameras. Connect according to the I/O types and pinout. Using cables with different color codes from other manufacturers may cause incorrect connections and damage the camera. Always use ContrasTech standard cables.

I/O Connection Definition and Assignments
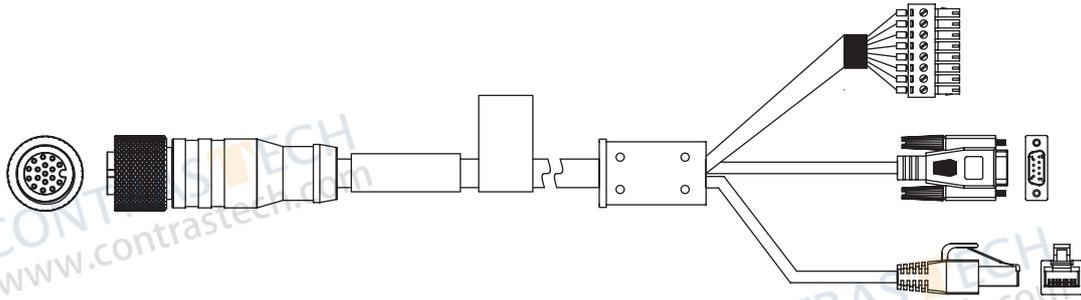
 * The 6th, 7th, 14th, and 15th pin of the interface in the 17-pin cable have been made as RJ45 connector. The lines of other pins should be wired according to the actual demands.
 * The RS-232 serial port part corresponding to the interface pin 4 and 5 in the 17-pin cable has been made into a DB9 female serial port.
The DB9 female serial port comes with a 12V power port, which can power the device just like the 8-pin terminal power supply. When supplying power to the device, only one of them can be used, otherwise the power supply may be burned.

> ℹ The 8-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.

 * The other pins in the 17-pin cable have been made into 8-pin terminals, as shown in the figure below. The signal definition of each pin is shown in the following table, and the corresponding IO interface can be wired according to the actual use needs.
 * When three I/O channels are used simultaneously, you should purchase IO box or use the open cable to wire pull up/down resistor.
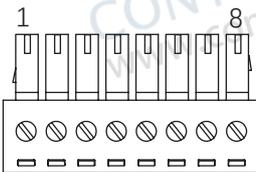
Color		Pin	Signal	Designation
Brown		1	DO_5	Non-isolated Output
Brown	White	2	DO_4	Non-isolated Output
Blue	White	3	DO_3	Non-isolated Output
Blue		4	DI_2	Non-isolated Input
White		5	DI_1	Non-isolated Input
Gray		6	DI_0	Non-isolated Input
Black		7	GND	Direct current power supply negative
Red		8	POWER_IN	Direct current power supply positive

> ℹ The 17-pin cable supplied with the factory varies depending on the type of equipment, please refer to the actual situation.

The wire color of this user manual is the color of ContrasTech. If you use other manufacturers' cable color definitions may be different, random connection may cause the camera to burn out, please connect according to the I/O port type and pin definition or contact our technical staff for advise.

IO Box

When three I/O channels are used simultaneously, you should purchase IO box to connect the device's power supply and I/O interfaces to the external device. These two IO boxes are supported.

ℹ️	Appearance here is for reference only. Please refer to the actual one.

| Type	Usage
V1.0	The IO box can be used for switching pull-up and pull-down resistors for each IO channel.
V2.0	The IO box can be used for upgrading the non opto-isolated IO to opto-isolated IO.

ℹ️	If the field space is limited and the device IO is not available via the IO box, please purchase the resistor separately and refer to the user manual of the respective device for the IO wiring.

The IO box is used to connect the power supply and I/O interfaces of the device. When wiring the four I/O interfaces of the device on your own, you need to connect pull-up or pull-down resistors to ensure the device operates properly. At this time, resistors need to be prepared and wired by yourself, which is quite troublesome. However, the 8-pin I/O box V1.0 has built-in pull-up or pull-down resistors on each I/O channel, allowing for quick I/O wiring.

V1.0

V2.0
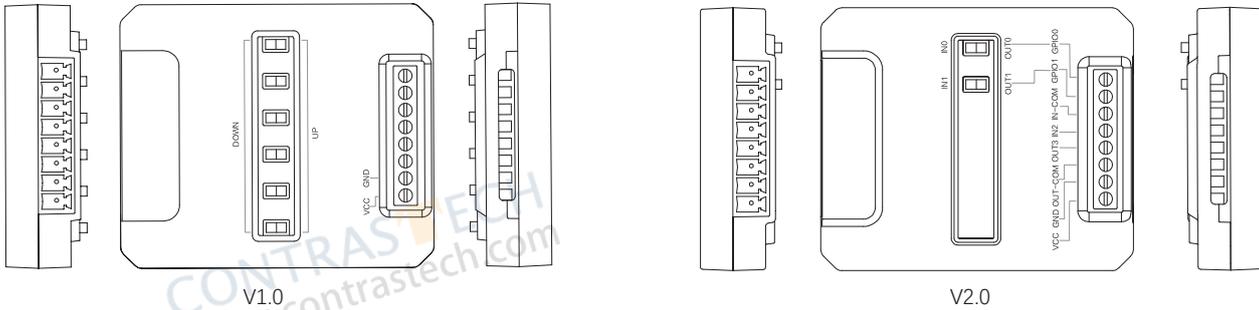
● Left-side interfaces: 8-pin terminal for connection of device with a supplied cable.
● Right-side interfaces: VCC and GND are used to connect to switch power supplies or power adapters to power the devices equipped with the IO box.

• V1.0: Out of the rest six pins, four are used to connect to external NPN or PNP devices for receiving external trigger signals or sending signals to external devices.Among the six pins, two are set aside.
• V2.0: The rest are I/O signal lines or signal grounds to connect external NPN or PNP devices for receiving external trigger
• signals or sending signals to external devices.

V1.0 Internal Circuit
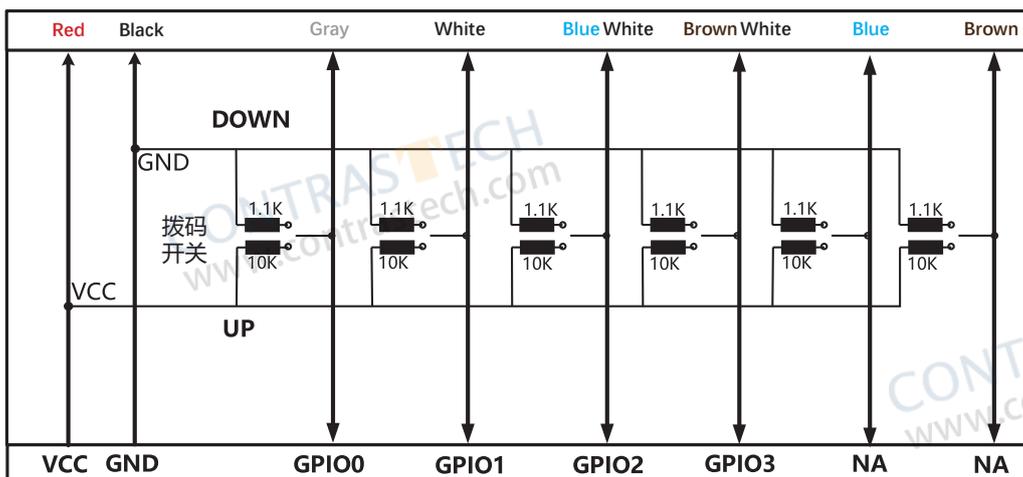
You can use IO box to connect NPN/PNP devices to access to pull-up and pull-down resistors.
• Industrial code reader: You should use the ContrasTech cable to connect the code reader to the top terminal of the IO box.
• External devices: You should connect external devices to the bottom terminal of the IO box.
• Pull-up and pull-down resistors: if the DIP switch is switched to DOWN, pull-down resistor is connected. If the DIP switch is switched to UP, pull-up resistor is connected.

| ℹ️	● The current IO box has the default pull-up shorted to the device power supply VCC. When powered on, the output level is equal to the device VCC. Please pay attention to voltage matching during the connection with the device. ● The default pull-up resistor of the IO box is 10 KΩ, and the default pull-down resistor is 1.1 KΩ. In actual use, please note the driving capability of the pull-up/down and the voltage division issue.

IO Box

V1.0 I/O Wiring

When connecting an external device to trigger input/output via an IO box, there are several wiring methods for different scenarios, as shown in the table below. You can select an appropriate wiring method according to your actual needs.
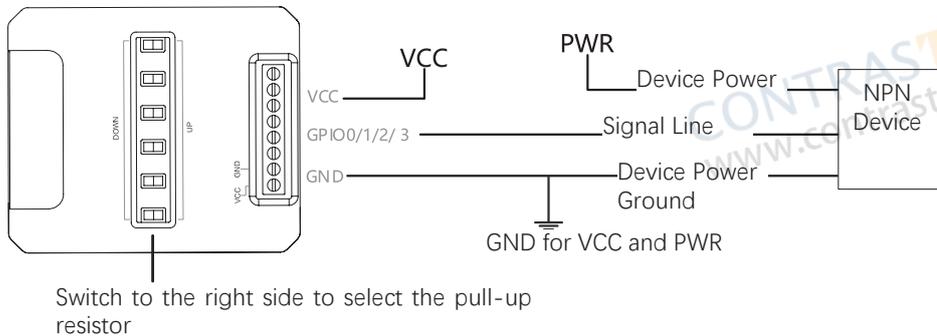
Applicable I/O	Applicable Scenarios
Input Only	Connect to an external PNP device via the pull-down resistor within the IO box.

Connecting to PNP Device

Switch to the left side to select the pull-down resistor
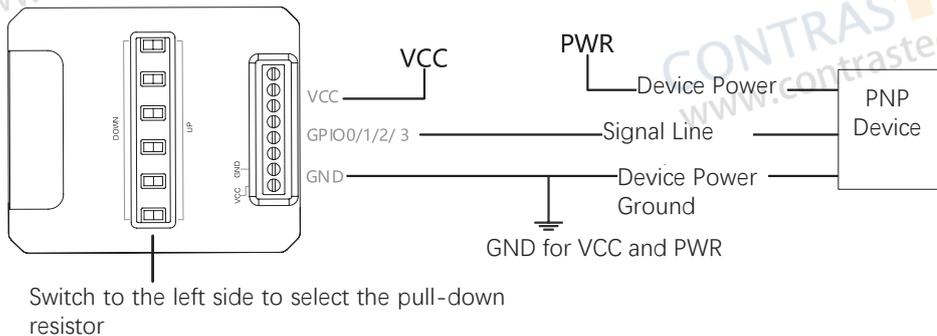
Applicable I/O	Applicable Scenarios
Input and Output	Connect to an external NPN device via the pull-up resistor within the IO box.

Connecting to NPN Device

Switch to the right side to select the pull-up resistor

> ● The left side of the wiring diagram is a silkscreen information on the IO box. The order of the information may differ from the actual IO box. Please refer to the wiring diagram and silkscreen information on the actual IO box to wire the device.
>
> ● When the input interface connects to external switch signals and the output interface connects to external PNP devices, it is not necessary to use the IO box as an intermediary. You can directly use the cables supplied with the device for wiring. For detailed wiring instructions, please refer to the user manual of the corresponding device.
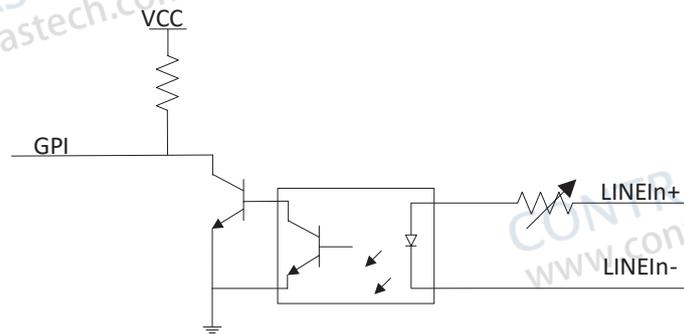
IO Box

V2.0 Internal Circuit
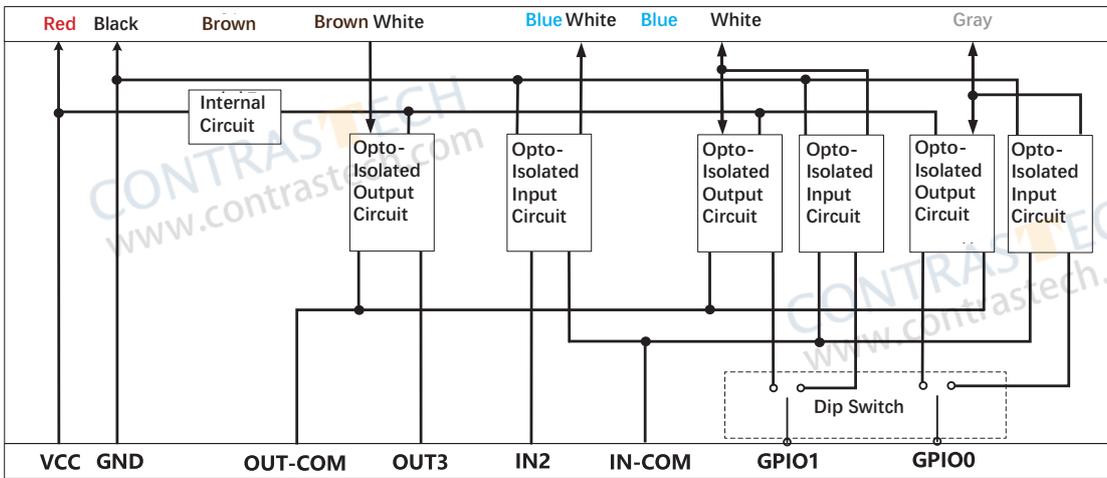
| | The color corresponds to the color of the cable at the 8-pin terminal. |

V2.0 Opto-Isolated Input

A diagram of the opto-isolated input circuit in the IO box is shown in the following figure.

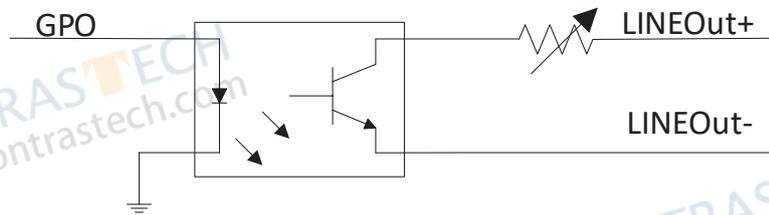| | The voltage of the opto-isolated input is from 5 VDC to 24 VDC, and breakdown voltage is 30 V. Please keep the voltage stable. |

The electrical feature of the opto-isolated input signal is shown in the table below.

Parameter Name	Value
Opto-Isolated Turn-On Voltage	2 V
Input Falling Delay	81.6 μs
Input Rising Delay	7 μs

IO Box

V2.0 Opto-Isolated Output

A diagram of the opto-isolated output circuit in the IO box is shown in the following figure.

ℹ️
- The voltage of the opto-isolated output is from 5 VDC to 24 VDC, and the max. output current is 100 mA.
- I/O outputs cannot be used directly with inductive loads, such as DC motor.

The electrical feature of the opto-isolated output signal is shown in the table below.

Parameter Name	Value
Output Falling Delay	6.3 µs
Output Rising Delay	68 µs
Output Residual Voltage	● Output residual voltage is proportional to drive current. ● The residual voltage is 2.5 V when the drive current is 25 mA.

ℹ️
The current and output logic level low of the output signal may vary slightly when the external voltage and resistance are different.

V2.0 DIP Switch

The bi-directional I/O (GPIO0/1) has opto-isolated input and output circuits that can be switched via a DIP switch. The DIP switch and operation method are shown in the following figure.

Input：Dial to the IN1/0

Output：Dial to the OUT1/0
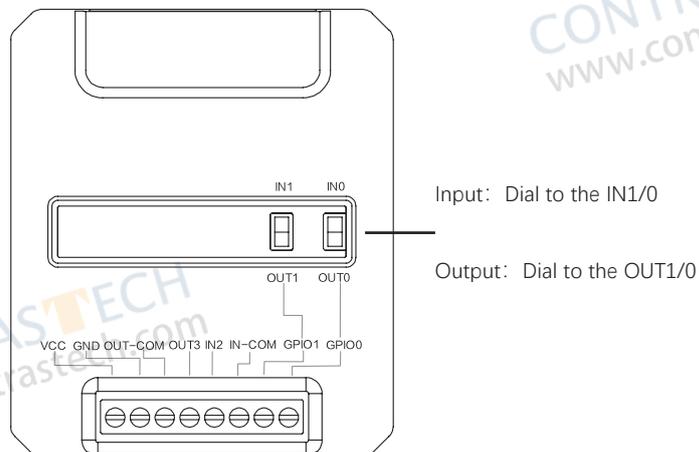
ℹ️
When using bi-directional I/O, please ensure that the I/O mode on the client software is consistent with the settings on the DIP switch. Both are set to input or both to output. Otherwise, it will not work.

IO Box

V2.0 I/O Wiring

When connecting an external device to trigger input/output via an IO box, there are several wiring methods for different scenarios. You can select an appropriate wiring method according to the actual needs.

ℹ	For the following wiring diagrams, please note the following information.
	● The left side of the wiring diagram is a silkscreen information on the IO box. The order of the information may differ from the actual IO box. Please refer to the wiring diagram and silkscreen information on the actual IO box to wire the device.
	● For the the input/output properties of the signal line and the signal ground should be matched. If IN2 or GPIO0/1 is used in the signal line, and GPIO0/1 is set to IN0/1, the device power ground should be connected to IN-COM. If OUT3 or GPIO0/1 is used in the signal line, and GPIO0/1 is set to OUT0/1, the device power ground should be connected to OUT-COM.
	● When connecting to the external device via IN2 or GPIO0/1 (GPIO0/1 is set to IN0/1) of the IO box, you need to set different trigger-related parameters based on the implementation principle of internal opto-isolated input.

Wiring Diagram 1: When the IO box is connected to external PNP devices for input or output

ℹ	When wiring, the trigger parameters need to be set in reverse.That is, if an external device is required to send a low-level signal to the IO box for triggering the device, the parameter Trigger Type should be set to Level High.
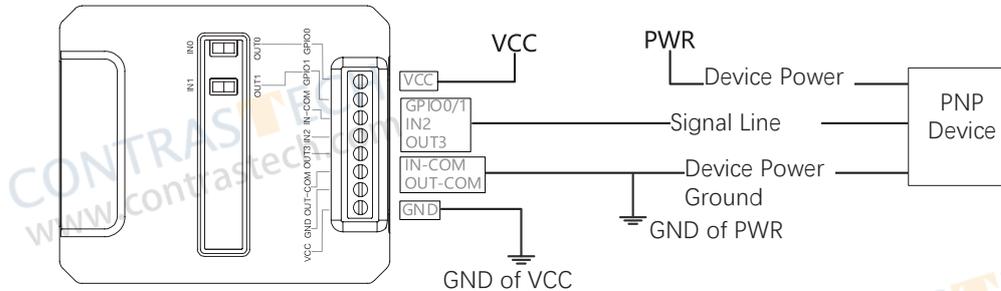
Wiring Diagram 2: When the IO box is connected to external NPN devices for input or output, no external pull-up resistors are required at this time.

ℹ	When wiring, you do not need to reverse the trigger-related parameters. You can directly set the parameters according to the actual signal level. Specifically, if an external device is required to send a low-level signal to the IO box for triggering the device, you can select the Level Low.

- When IO box input connecting to external NPN device, you can refer to the following wiring method in most cases. However, in some cases, you should refer to Wiring Diagram 3 for wiring.
- When IO box output connecting to external NPN device, you can refer to the following wiring method in all cases.

IO Box

V2.0 I/O Wiring

Wiring Diagram 3: Only applicable when the IO box input connecting to NPN-type photoelectric sensor, and it is necessary to trigger multiple devices (for example, more than 6 devices). In this case, a pull-up resistor should be connected.

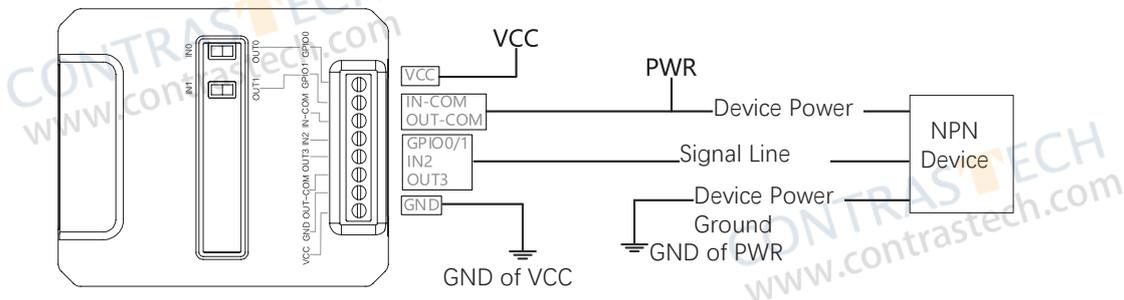| i	When wiring, the trigger parameters need to be set in reverse.That is, if an external device is required to send a low-level signal to the IO box for triggering the device, the parameter Trigger Type should be set to Level High.

i	● If the NPN device's PWR is 12 V or 24 V, it is recommended to use a 1 kΩ pull-up resistor. ● In this scenario, if you refer to Wiring Diagram 2 for wiring, there is a possibility that the triggering will not be successful.

3

CHAPTER 3　**INSTALLATION AND SETUP**

You should perform the software installation procedure first and the hardware installation procedure second.

Software Installation

■ DM-Datum Installation

If you use a firewall on your computer, disable the firewall for the network adapter to which your camera is connected.

Close the Firewall

In order to ensure the camera software keep running and image transmission stability, please close the firewall before using the software.

System Requirements

Code Reader Software Suite for Windows requirements that one of the following operating systems is installed on your computer:

- ■　Windows XP (32 bit)
- ■　Windows 7 (32 bit or 64 bit)
- ■　Windows 10 (32 bit or 64 bit)

Installation Steps

1.You can download the software from:

http://www.contrastech.com/en/service/005001.html

2.Double click DM-Datum installation package to install the client.

3.Follow the instructions on the screen. The installer will guide you through the installation process.

Network Settings

Before using the camera, you need to configure IP is in the same network segment with the computer. You can modify it in "Local Connection" to ensure network communication is normal.

Local Network Configuration :

● 　Click "Control Panel"> "Network and Internet"> "Network and Sharing Center"> "Change Adapter Configuration. "Then select corresponding network card to configure it automatically obtain IP address or manually assign it as same network segment address with the camera. Shown as below:

Hardware Installation

1. Install the equipment to the fixed bracket with M4 screws, and then install it on other mechanical parts through the fixing bracket, and the installation method can be selected according to the actual application scenario.

2. Refer to the interface definition in the POWER AND I/O IENTERFACE DEFINITION section for wiring, and connect it to the appropriate power adapter or switching power supply to power the device.

3. Use the network cable to connect the device to the switch or network card normally for image debugging or data communication.

Software Operation

◼ DM-Datum Operation

Double-click the DM-Datum shortcut on the desktop to open up the client software, the client software can read the device information and display it.

◼ Main interface
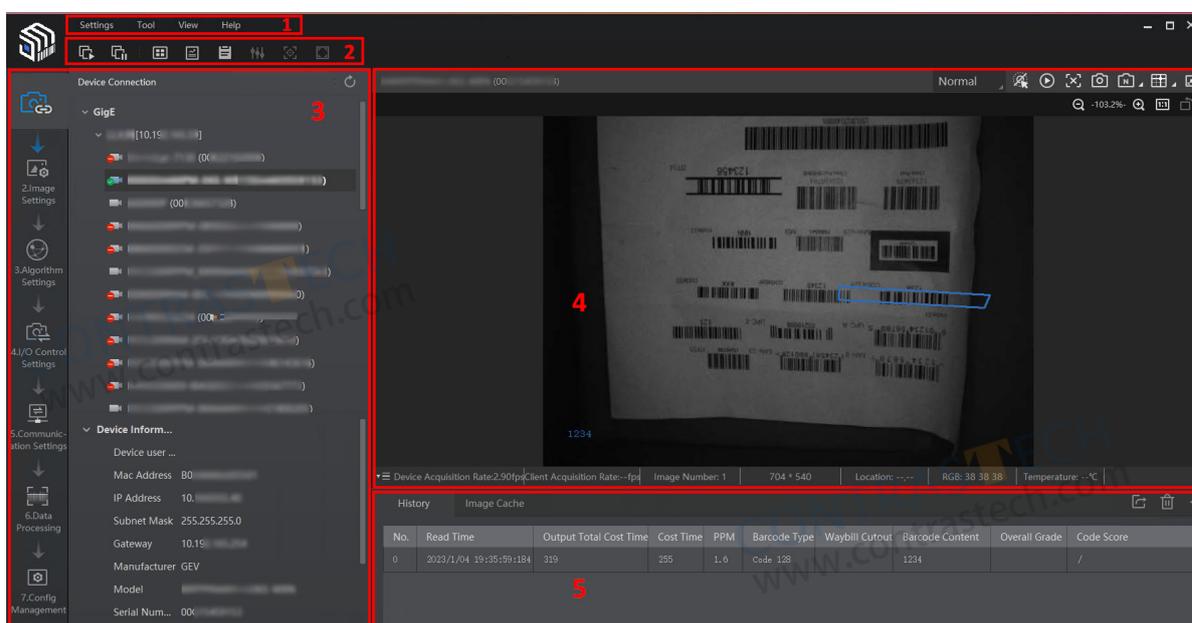
◼ Menu Bar

The menu bar displays function modules, including Settings, Tool, View, and Help.

◼ 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.

◼ Device Configuration Area

You can connect or disconnect device, set parameters, and modify device IP address in this area.

◼ 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.

◼ History Record and Image Cache

This area displays different barcode information read by the device in real-time, including read time, cost time, code type, content, code score, etc. You can also set image cache here.

Software Operation

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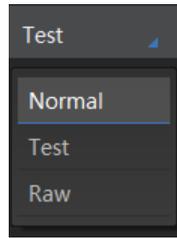
You can set device parameters in device configuration area.

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 barcodes, set barcode 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.

You can click ⊙ in the live view window to view images and the code reading effect. For the code read in real time, the client will frame the code in the real-time screen and display the specific code information on the left side, as shown in the following figure.

If the effect is not very good, you can adjust the focus knob (the manual focus device only) or related parameters in Image Settings area.Includes exposure time, gain, gamma, and light source parameters. At the same time, for manual focusing equipment, the focus knob on the side of the device can be manually adjusted; For devices with mechanical focus lenses, the image effect can be adjusted through the autofocus function.

> ℹ️ ● For equipment without light source, it is necessary to fill the light through an external light source.
> ● For different firmware versions or models of device, the light source functions may be different, please refer to the actual one you got.

4

CHAPTER 4 DEVICE SETTINGS

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.
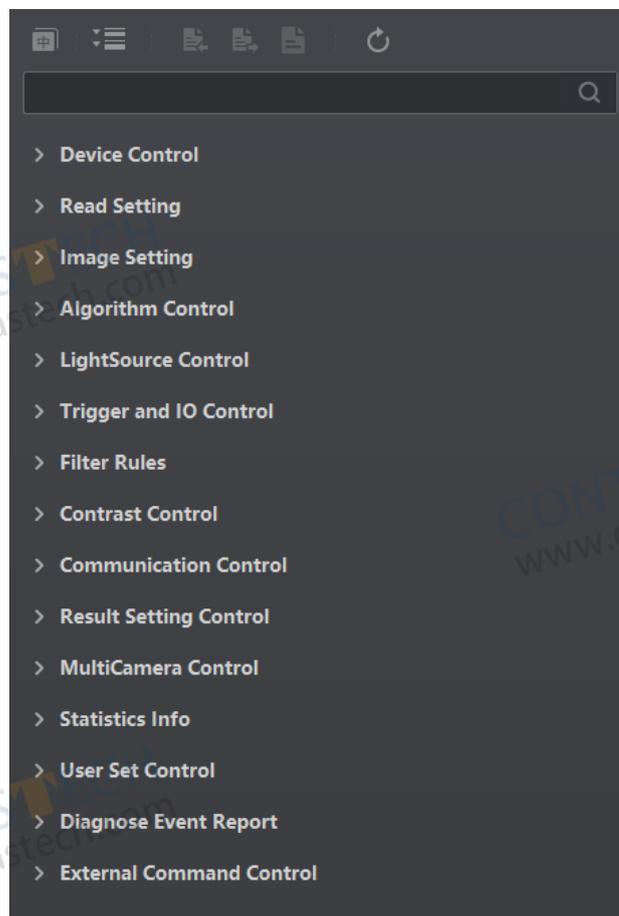
Feature Tree Introduction

Name	Description
Device Control	It allows you to view the device's information, edit its name, etc.
Read Setting	It allows you to set the device's operation mode and select code types.
Image Setting	It allows you to set frame rate, exposure, gain, Gamma, etc.
Algorithm Control	It allows you to algorithm parameters.
Focus Control	It allows you to configure the device's focus mode and related focus parameters.
SelfAdapt Control	It allows you to adjust exposure, gain, gamma, and other parameters with a single click.
LightSource Control	It allows you to set the light source's parameters.
Trigger and IO Control	It allows you to set parameters of input and output.
Filter Rules	It allows you to set the filter rule of codes.
Comtrast Control	It allows you to compare the data that the device reads with preset data and output contrast result.
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.
Statistics Info	It allows you to count data related with code reading.
Diagnose Event Report	It allows you to monitor memory and CPU usage rate, and let you know when there is a crash, higher CPU usage rate, insufficient memory, etc.

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

Image Quality Settings

You can set different image parameters like exposure time, gain, Gamma, acquisition frame rate, acquisition burst frame count in image parameters interface.

| ℹ | For specific parameter range like exposure time, gain and acquisition frame rate, refer to the device's specification for details. |

■ Image

You can set parameters like exposure time, gain, Gamma, acquisition frame rate, acquisition burst frame count, etc. in Image Settings area.

● Exposure Time： You can increase exposure time to improve image brightness. To some extent, increasing exposure time will reduce acquisition frame rate, and impact image quality.

● Gain： You can increase gain to improve image brightness. To some extent, increasing gain will create more image noises, and impact image quality.

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

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

● Acquisition Burst Frame Count： Acquisition burst frame count refers to the outputted image number when the device is triggered once.

● Polling Enable： It enables the polling function, you can select off, single or multiple mode. The parameter of polling enable will be displayed only when the trigger mode is on.
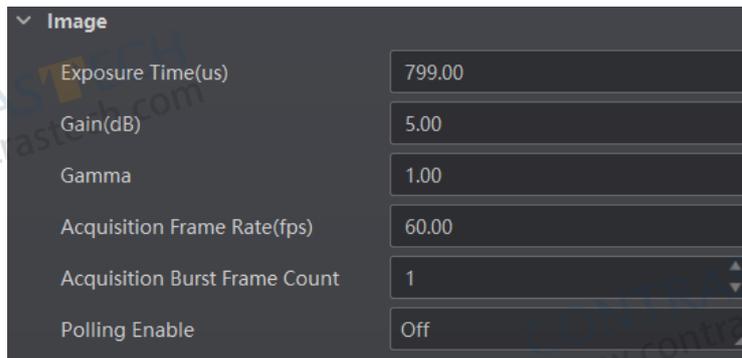
∨ **Image**	
Exposure Time(us)	799.00
Gain(dB)	5.00
Gamma	1.00
Acquisition Frame Rate(fps)	60.00
Acquisition Burst Frame Count	1
Polling Enable	Off

Image Quality Settings

■ Exposure

The device supports three types of exposure modes, including off, once, and continuous Refer to the table below for details.

Exposure Mode	Description
Off	The device exposures according to the value configured by the user in Exposure Time (µs).
Once	The device adjusts the exposure time automatically according to the image brightness. After adjusting once, the device will switch to off mode.
Continuous	The device adjusts the exposure time continuously according to the image brightness.
Exposure Alternate	Perform alternate exposures based on the multiple sets of exposure parameter values configured by the user.

When selecting different exposure modes, the parameters that need to be configured vary.

Once/Continuous

When selecting "Once" or "Continuous" as the exposure mode, you can set the exposure range. The configuration method is as follows:

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

2.Go to Image Setting, and select Once or Continuous as Exposure Auto according to actual demands.

3.Select Global or Partial as Exposing Area according to actual demands.

4.(Optional) Set specific exposure area if Partial is selected.

_ Area Width: It refers to the horizontal resolution in partial exposure area.

_ Area Height: It refers to the vertical resolution in partial exposure area.

_ Offset X: It refers to the horizontal coordinate of upper left corner in partial exposure area.

_ Offset Y: It refers to the vertical coordinate of upper left corner in partial exposure area.

Exposure Auto	Continuous
Exposing Area	Partial
Area Width	1408
Area Height	1024
Offset X	0
Offset Y	0
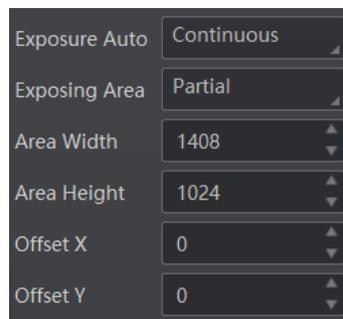
Exposure Alternate

When the exposure mode is set to "Exposure Alternate" you need to configure the parameter groups involved in the alternate exposure and their corresponding exposure values. The setup method is as follows:

1. Locate and expand the **Image Setting** property in the attribute tree.

2. Enable **Exposure Alternate**.

3. Select any set of parameters from **Exposure1~Exposure8** under **Exposure Index**.

4. Enable **Exposure Enable** under the selected parameter group, indicating that this set of parameters will participate in alternate exposure.

5. Set the exposure value for the selected parameter in **Exposure Time**, as shown in the figure below.

Exposure Alternate	
Exposure Index	Exposure3
Exposure Enable	
Exposure Time	799
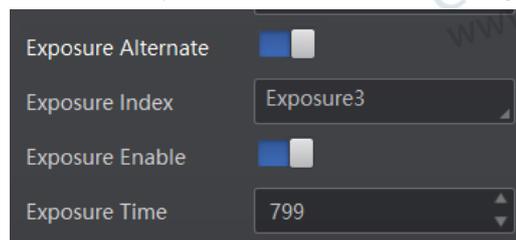
6. Repeat steps 3 to 5 to set exposure values for each selected parameter group.

> ℹ The parameters of the Exposure Alternate may differ by device models and firmware versions.
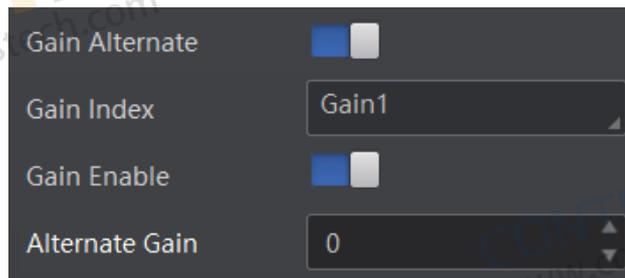
Image Quality Settings

■ Gain

The device supports four types of gain modes, including off, once, continuous, and Gain Alternate. Refer to the table below for details.

Gain Mode	Working Principle
Off	The device adjust gain according to the value configured by the user in Gain (dB).
Once	The device adjusts gain automatically according to the image brightness. After adjusting once, the device will switch to off mode.
Continuous	The device adjusts gain continuously according to the image brightness.
Gain Alternate	Gain Alternate is performed based on the multiple sets of gain parameter values configured by the user.

When the gain mode is set to "Gain Alternate" you need to configure the parameter groups involved in the alternate gain and their corresponding gain values. The setup method is as follows:

1. Locate and expand the **Image Setting** property in the attribute tree.

2. Enable **Gain Alternate**.

3. Select any set of parameters from **Gain1~Gain8** under **Gain Index**.

4. Enable **Gain Enable** under the selected parameter group, indicating that this set of parameters will participate in alternate gain.

5. Set the gain value for the selected parameter in **Alternate Gain**, as shown in the figure below.

6. Repeat steps 3 to 5 to set gain values for each selected parameter group.

The alternate gain parameters may vary depending on the device model and firmware version. Please refer to the actual parameters for specific configurations.

6. Repeat steps 3 to 5 to set gain values for each selected parameter group.

ℹ	The parameters of the Gain Alternate may differ by device models and firmware versions.

Image Quality Settings

◼ Polling

The device supports the polling function, which can be configured via the Polling Enable parameter under the Image Setting property.

The options for the Polling Enable parameter are described as follows:

- Off: Disables the polling function.
- Single: Single-parameter group mode. Specifies 1 set of parameters (out of 1-8 sets) in the polling module for detection.
- Multiple: Multi-parameter group polling mode. Specifies any 2-8 sets of parameters in the polling module for cyclic detection.

ℹ️	● After the polling enabled, the device acquires images with its max. frame rate. Once the polling disabled, the frame rate you set in Acquisition Frame Rate takes effect. ● When the trigger source is set to "brightness trigger," parameter polling is not supported. To use polling, please disable the sensor trigger function. ● The polling function, specific parameters as well as parameter values may differ by device models.

Single Mode

In single mode, it supports specifying 1 set of parameters (out of 1-8 sets) in the polling module for detection.

Before You Start：

- Make sure the trigger mode is opened and the trigger source is not the brightness before setting the polling function.
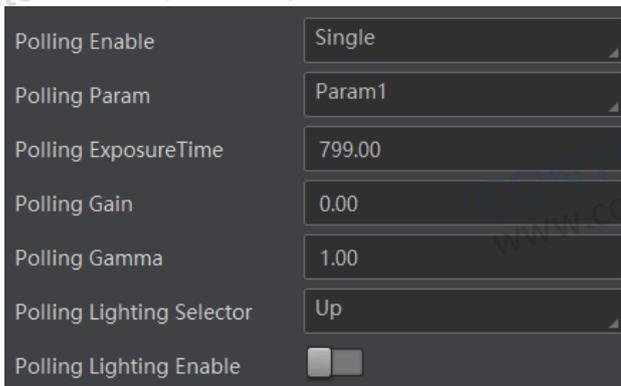
ℹ️	The brightness trigger source and the polling function cannot be used at the same time.

- It is recommended to use the polling function under the normal operation mode, and test/raw modes are used for debugging only.

Steps：

1. Go to Image Setting → Polling Mode, and select Single as Polling Enable.

Polling Enable	Single
Polling Param	Param1
Polling ExposureTime	799.00
Polling Gain	0.00
Polling Gamma	1.00
Polling Lighting Selector	Up
Polling Lighting Enable	

2. Select one parameter (e.g. Param1) from Polling Param.

3. Click "Polling" on the main interface to enter the parameter polling page.

4. (Optional) The name of the current polling parameter group can be customized via the Polling Group Name parameter.

5. Set parameters participating the polling like Polling Exposure Time, Polling Gain, Polling Gamma, etc. according to actual demands.

Parameter	Description
Polling Exposure Time	It sets the exposure time of polling. (us)
Polling Gain	It set the polling gain. (dB)
Polling Gamma	It sets the polling Gamma value. ● If the value is between 0 and 1, when the image brightness increases,dark area becomes brighter. ● If the value is between 1 and 4, when the image brightness decreases, dark area becomes darker.
Polling Focus Enable	After enabling this parameter, you can set polling focus position.
Polling Lighting Selector	It selects lamps on different directions, including up/down and mid.
Polling Lighting Enable	After enabling this parameter, the light source will turn on.
Polling Output Selection	Choose the polling output port, options include Pin Output 3/4/5.
Polling Output Event	Select the polling output event. Currently, only the "Constant On" event is supported.

ℹ️	When polling enable is activated, configuring external IO events is not supported. Therefore, please complete the external event configuration before setting up the polling internal IO events.

Image Quality Settings

Multiple Mode

In multi-parameter group polling mode, it supports specifying any 2-8 sets of parameters in the polling module for cyclic detection.

Multiple mode supports triggered parameter polling (including software trigger, external trigger, TCP, UDP, etc.), but does not support externally triggered polling stop.

Before You Start：

● Make sure the trigger mode is opened and the trigger source is not the brightness before setting the polling function.
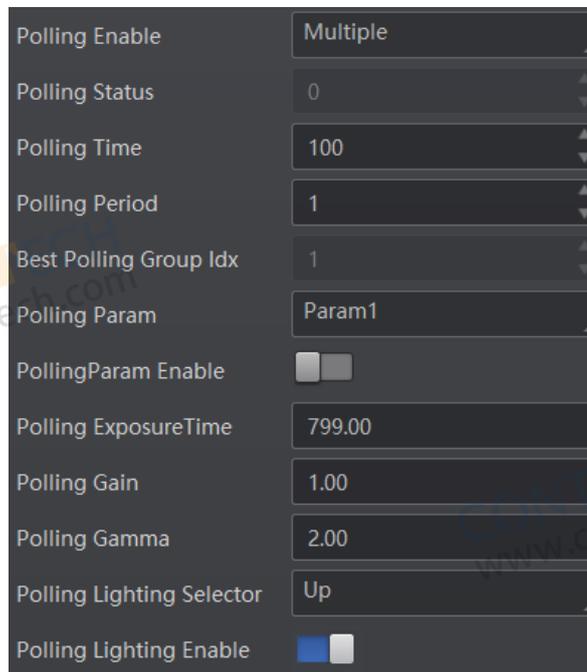
> ℹ️ The brightness trigger source and the polling function cannot be used at the same time.

● It is recommended to use the polling function under the normal operation mode, and test/raw modes are used for debugging only.

Steps：

1. Go to Image Setting → Polling Mode, and select Multiple as Polling Enable.

Polling Enable	Multiple
Polling Status	0
Polling Time	100
Polling Period	1
Best Polling Group Idx	1
Polling Param	Param1
PollingParam Enable	
Polling ExposureTime	799.00
Polling Gain	1.00
Polling Gamma	2.00
Polling Lighting Selector	Up
Polling Lighting Enable	

2. Configure the polling duration and cycle using the Polling Time and Polling Period parameters. The specific parameter definitions are as follows:
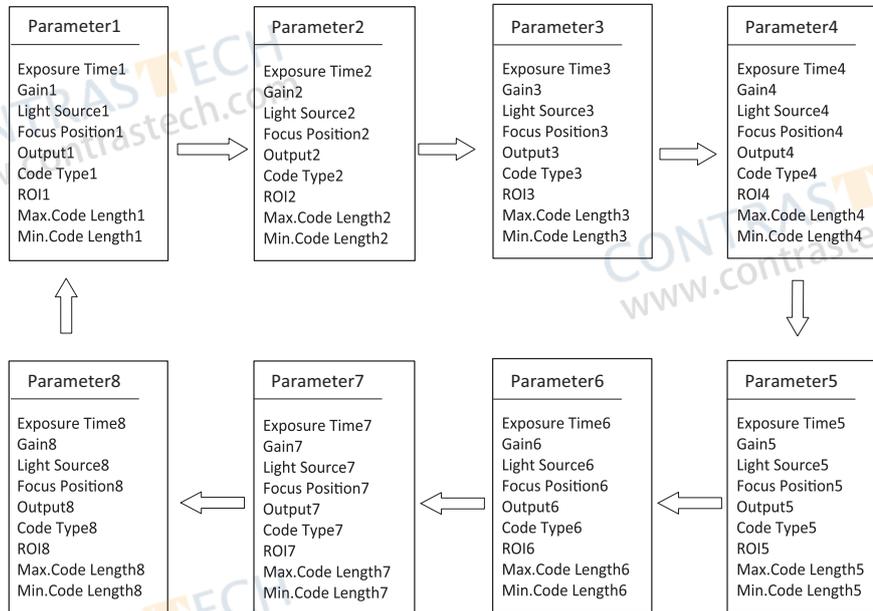
_ Polling Time: The duration of device polling. The polling mode outputs at least 2 frames to determine the polling end state.

_ Polling Period: One complete traversal of all polling parameter selectors (Param1~Param8) constitutes a polling period.

3. On the main interface, click Polling to enter the polling page and configure the polling group parameters.

Image Quality Settings

4.Select 2–8 sets of parameters from Param1~Param8 in the polling parameters. Enable the Polling Parameter Enable option under each selected parameter to determine whether the parameter set participates in polling. The polling sequence among the 8 parameter sets is illustrated in the figure below.

Parameter1	Parameter2	Parameter3	Parameter4
Exposure Time1 Gain1 Light Source1 Focus Position1 Output1 Code Type1 ROI1 Max.Code Length1 Min.Code Length1	Exposure Time2 Gain2 Light Source2 Focus Position2 Output2 Code Type2 ROI2 Max.Code Length2 Min.Code Length2	Exposure Time3 Gain3 Light Source3 Focus Position3 Output3 Code Type3 ROI3 Max.Code Length3 Min.Code Length3	Exposure Time4 Gain4 Light Source4 Focus Position4 Output4 Code Type4 ROI4 Max.Code Length4 Min.Code Length4

Parameter8	Parameter7	Parameter6	Parameter5
Exposure Time8 Gain8 Light Source8 Focus Position8 Output8 Code Type8 ROI8 Max.Code Length8 Min.Code Length8	Exposure Time7 Gain7 Light Source7 Focus Position7 Output7 Code Type7 ROI7 Max.Code Length7 Min.Code Length7	Exposure Time6 Gain6 Light Source6 Focus Position6 Output6 Code Type6 ROI6 Max.Code Length6 Min.Code Length6	Exposure Time5 Gain5 Light Source5 Focus Position5 Output5 Code Type5 ROI5 Max.Code Length5 Min.Code Length5

> ℹ️ The polling sequence follows this rule: It starts from the optimal parameter group, then proceeds sequentially from the foremost enabled polling parameter group.
> For example:
> If the enabled polling parameters are 1, 2, 3, 4, and 5, and parameter 3 is used for the current recognition (i.e., as the optimal group), then the polling order will be:Parameter 3 → Parameter 1 → Parameter 2 → Parameter 4 → Parameter 5.This completes one polling cycle.

4.(Optional) Use the Library Name parameter to customize the name of the current polling parameter group.

5.Configure the parameter types to be polled for the selected group:Exposure、Gain、Gamma value、Focus position、Lighting、Output signal、Output event、Code type selection、Polling ROI region、Upper and lower limits of code length.

Parameter	Description
Polling Exposure Time	It sets the exposure time of polling. (us)
Polling Gain	It set the polling gain. (dB)
Polling Gamma	It sets the polling Gamma value. ● If the value is between 0 and 1, when the image brightness increases,dark area becomes brighter. ● If the value is between 1 and 4, when the image brightness decreases, dark area becomes darker.
Polling Focus Position Enable	Enabling "Polling Focus Position Enable" allows setting specific "Polling Focus Position" parameters.
Polling Lighting Selector	It selects lamps on different directions, including up/down and mid.
Polling Lighting Enable	After enabling this parameter, the light source will turn on.
Polling Output Selection	Choose the polling output port, options include Pin Output 3/4/5.
Polling Output Event	Select the polling output event. Currently, only the "Constant On" event is supported.
Code Type Selection	Select the code type to be polled.
Single-Group Polling Repeat Count	Configure the number of consecutive polling cycles for the current parameter group.
Single-Group Polling Timeout (ms)	Configure the maximum polling duration for the current parameter group.
Polling Region of Interest (ROI)	Configure the polling group to only output code content read from the specified ROI.
Maximum Code Length	Configure the upper limit for the barcode length of the specified code type during polling.
Minimum Code Length	Configure the lower limit for the barcode length of the specified code type during polling.

> ℹ️ ● For parameter groups selected to participate in polling, repeat Step 5 to configure each group individually.
> ● Once polling is enabled, external IO event configuration is not supported. Therefore, ensure external event configuration is complete before setting up polling internal IO events.

Image Quality Settings

5. (Optional) Through the attribute tree, stop the polling under trigger control by specifying the number of stop enable parameters. Set whether to enable the polling stop condition. Once enabled, the following parameters can be configured.

● Polling stop condition: The stop condition can be set to either a specified number within a single frame or a specified number within the entire polling cycle.

● Polling stop count: The polling stops when the device reads the specified number of barcodes.

6. The current polling status and the optimal polling group count can be viewed through the polling status and optimal polling group count parameters.

● Polling status: Displays the current polling status. 0 indicates polling has ended, and 1 indicates polling is running.

● Optimal polling group count: When polling is not enabled, the optimal group count node defaults to 1. When polling is enabled and a barcode is read, it displays the polling parameter ID of the currently read barcode. When relevant polling parameters are modified and the parameter confirmation button is clicked, the optimal group count reverts to the default value of 1.

Image Quality Settings

■ 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.

The light source types are divided into Own Lighting, External Lighting, and Non-Lighting.

Own Lighting

If you select Own Lighting as Light Type, you can set the following parameters.Depending on the device type, either 4 groups of lamps or 6 groups of lamps can be supported, and the configurable parameters also differ. The specific steps are as follows:

1.In the Light Type dropdown menu, select "Own Lighting."

2.Use the "Lighting Selector" parameter to enable the desired lighting channels based on actual needs.

_ For devices with 4 groups of lamps, click the top, bottom, left, or right lamps to activate the corresponding lighting channels. Alternatively, you can check All to turn on all lamps.

_ For devices with 6 groups of lamps, click the top-left, top-center, top-right, bottom-left, bottom-center, or bottom-right lamps to activate the corresponding lighting channels. Alternatively, you can click All On or All Off to turn on or turn off all lamps.

3. Select the lighting mode. Different device models support different lighting modes, including Strobe and Long. Strobe means the light flashes at a specific interval during code reading, and Long means the light is solid during code reading.

> ℹ️ When switching the lighting mode, the lighting enable must be turned off, as mode switching is not supported while enabled.

4.(Optional) Depending on actual usage requirements, you can enable Aiming Light Enable to enable the device's aiming light.

5.(Optional) Configure the lighting-related parameters as needed, as shown in the figure below. The specific parameter meanings are as follows:

_ Lighting Duration：It sets the lighting duration and the unit is μs.

_ Lighting Delay Time：This parameter is available only when you set Flash Strobe as the Light Mode.It determines the delay time for lighting after exposure and the unit is μs.

_ Precharge Time：It determines how earlier the light source starts lighting before exposure and the unit is μs.

External Lighting

If you select External Lighting as Light Type, you can set the following parameters.

1.In the Lighting Type dropdown menu, select "External Lighting."

2.Configure the lighting-related parameters as needed, as shown in the figure below. The specific parameter meanings are as follows:

_ Line Out Duration：The lighting duration of the external light source and the unit is μs.To prevent the external lighting from not turning on during device exposure, it is recommended to set the Output Duration value to no less than the sum of the Output Ahead Time and Exposure Time.

_ Line Out Delay Time：It sets the delay time for lighting after device outputs event source, and the unit is μs.

_ Line Out Ahead Time：It sets how earlier the external light starts lighting before the device outputs event source information, and the unit is μs. To avoid the external lighting failing to turn on when the device starts exposure, it is advisable to set an appropriate Output Ahead Time based on actual conditions.
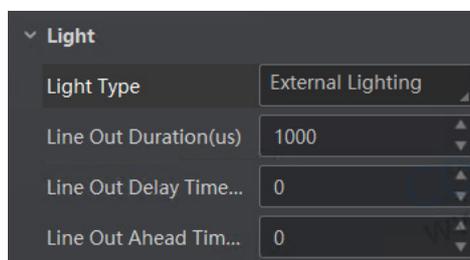
Non-Lighting

When "No Lighting" is selected as the light source type, the device will not activate any light source, and no additional parameters need to be configured.

> ℹ️ The parameter of light may differ by device model.

Image Quality Settings

■ 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.

ℹ	The parameters of the smart tune may differ by device models and firmware versions.

Smart Tune by Pressing Tune Button

Smart Tune allows for smart tuning via the device's button. This feature is only supported on certain devices equipped with buttons.

Steps：

1. Go to Image Settings, click All Features on the right corner, and find Smart Tune Control.

∨ SmartTuneControl	
Button Tune	⬜◼
SmartTune Start	Execute
Stop Tune	Execute
Tune Timeout(s)	90
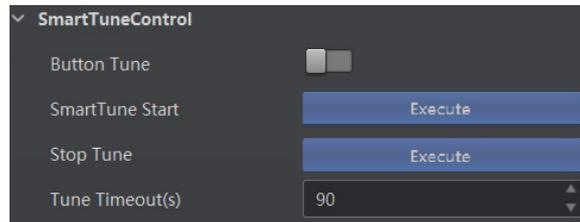
2. Enable Button Tune, and disconnect the device from the client software.

ℹ	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 sec and the device starts smart tune, The device will automatically start streaming and configure focus/adaptive parameters. The video feed will automatically close after adjustment completes.

_ During smart tuning process, the status indicator alternates between red and green;

_ When smart tuning is successful, the status indicator stays solid green for 3 seconds before resetting;

_ When smart tuning fails, the status indicator remains solid red for 3 seconds before resetting.

ℹ	● During the Smart Tune process, focus parameter adjustment is performed first, followed by self-adaptive parameter adjustment. ● The parameters of the smart tune may differ by device models and firmware versions. If only self-adaptive parameters is supported, the Smart Tune will execute self-adaptive parameters exclusively.

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

Image Quality Settings

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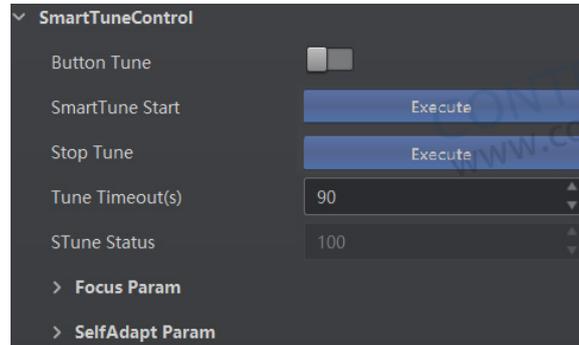
Apart from pressing tune button to realize smart tune, you can also configure parameters via the client software to realize it.

Before You Start：

Make sure that the device is not in trigger mode, and its operation mode is Test.

Steps ：

1. Go to Image Settings, click All Features on the right corner, and find Smart Tune Control.

2.(Optional) Set Tune Timeout. If the self-adaptive adjustment exceeds configured value, and it will stop automatically.

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.

4.(Optional) View smart tune process via Smart Tune Status.

5.(Optional) Click Execute in Stop Tune to stop smart tune process.

Image Quality Settings

■ Auto Focus

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

> ℹ️ Make sure that the device's operation mode is test before performing focus, and switch to the normal operation mode after the focus is completed.

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 → Smart Tune Control → Focus Param → Focus Mode Selector,and select Global Auto 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 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.
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) After adjusting focus, you can view the focusing score for this lens adjustment.

Global Manual Focus

Global Manual Focus requires manually setting the focus position, and the focusing process is completed step by step based on the clarity of the actual preview image.

Steps：

1. Go to Image Settings → Smart Tune Control → Focus Param → Focus Mode Selector,and select Global Manual 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. (Optional) Configure the motor position parameters according to actual requirements, while the current position's specific parameter values can be viewed through the motor position parameters.

4. Use the Focus Step parameter to set the focus stepping distance as needed.

5. Click Execute on the FocusPositive Execute or FocusNegative Execute parameters to adjust the focus position forward or backward. The focus direction can be selected based on the clarity of the actual preview image. When the image gradually becomes clearer, the focus stepping distance can be appropriately reduced for more precise focal adjustment to achieve optimal results.

6. (Optional) The focus score for this lens adjustment can be viewed via the focus scoring parameter.

7. After completing lens focusing, click Execute at the Motor Position Save parameter to save the current motor position. Click Execute at the MotorPositive Execute parameter to return the motor to its initial position.

Image Quality Settings

ROI Focus

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

Steps：

1. Go to Image Settings → Smart Tune Control → Focus Param → Focus Mode Selector,and select ROI 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 image in the window.

3. Click Draw in Draw Focus ROI, and draw ROI by dragging the mouse in live view window.
 (Optional) Set 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.

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

4.(Optional) Repeat step 3 if you want to set multiple ROIs.

5. For instructions on how to set up ROI focus, please refer to steps 3 to 5 of the Global Auto Focus section.

Image Quality Settings

■ Self-Adaptive Adjustment

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

Steps：

1. Go to Image Settings → Smart Tune Control → Self Adapt Adjust, and unfold Self Adapt Adjust.
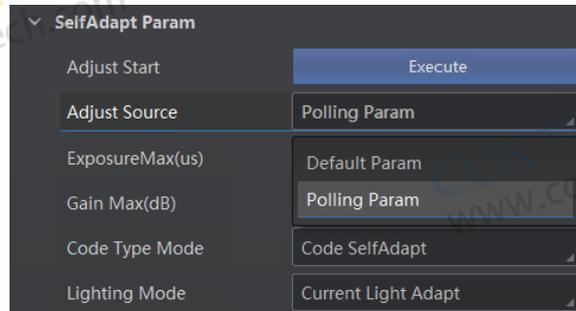
2. Select Adjust Source according to actual demands.

_ Default Param: It adjusts the default parameters.

_ Polling Param: It adjusts parameters configured in polling. After Polling Param is selected as Adjust Source, you should select a polling parameter group from Polling Param and enable or disable Focus Enable.
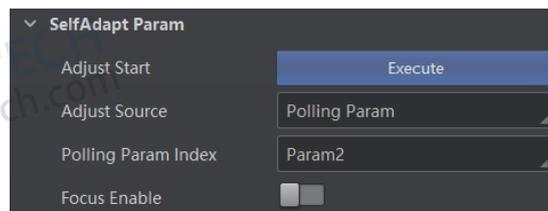
3. (Optional) Enable or disable Lighting Adapt during self-adaptive adjustment.

_ Adjust Source： If it is enabled, the client software will select the best one from all lighting options during the self-adaptive adjustment.

_ Turn All Lights On: All lighting channels will be activated when self-adaptive adjustment begins.

_ Turn All Lights Off: All lighting channels will be deactivated when self-adaptive adjustment begins.

4. (Optional) Set self-adaptive code type in Code Type Mode.

_ Code Self-Adaptive: 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.

5. (Optional) Set Exposure Max or Gain Max according to actual demands.

_ Exposure Max: It sets the max. exposure during the self-adaptive adjustment.

_ Gain Max: It sets the max. gain during the self-adaptive adjustment.

6. Click Execute in Adjust Start. The device will automatically acquire images and perform self-adaptive adjustment, and stop acquisition after adjustment is completed.

_ If the adjustment completed, the client software displays the spent time and prompts adjustment succeeded.

_ If the adjustment failed or is timeout, the client software prompts adjustment failure or timeout.

ⓘ	● Parameter adjustment cannot be initiated while the device is in streaming state. Adaptive adjustment operations can only begin after streaming has been stopped. ● The parameters of the Self-Adaptive Adjustment may differ by device models and firmware versions.

■ Other Features

Other Features allow configuration of image mirroring and test mode activation.

● Mirror X： Configures whether to enable horizontal image mirroring for the device.This function is enabled by default

● Test Pattern： The device's test image pattern. Default: Off (disabled). 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.

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

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.

■ 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.

1. In Algorithm Settings, click Add Barcode, select types of codes to be read, and set the 1D Code Number, 2D Code Number, and Stack Bar Number according to actual demands.
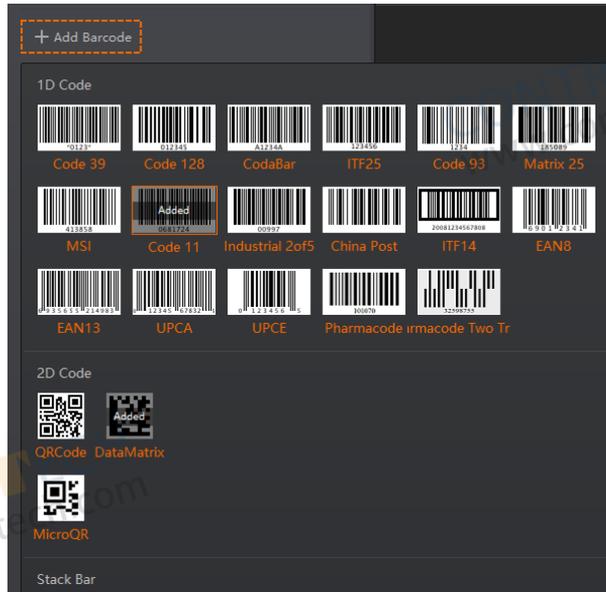
2. Selected symbology amount and added code amount may affect the code recognition time. Note that selecting more symbologies or adding more codes may consume more time to recognize codes in the image. Therefore, the code number is recommended to be set according to the actual demands.

3. The code reader may output actual code number when the mismatch between the actual code number and the code number set in the client software occurs.Note that setting more values may consume more time to recognize codes in the image. Therefore, the code number is recommended to be set according to the actual demands.

Code Algorithm Settings

■ Algorithm 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.

If no code is recognized in the algorithm ROI, and the device will output "noread".

The client software supports three ROI drawing methods: manual, batch, and chessboard-based. All three methods can be used simultaneously for ROI drawing.

Manual ROI

Steps:

1. Before drawing ROIs, make sure that there are images in the live view window after stopping preview.

2. Go to Algorithm Settings, click All Features, and find Algorithm ROI.

3. Click Draw to draw ROI in the live view window.

4. (Optional) Repeat the above step to draw multiple ROIs according to actual demands.

5. (Optional) Set other ROI parameters according to actual demands.

_ ROI Index: It indicates different ROIs and ranges from 0 to 149 which corresponds 1 to 150 ROIs.

_ Draw ROI Width: It refers to the width in algorithm ROI.

_ Draw ROI Height: It refers to the height in algorithm ROI.

_ Draw ROI Offset X: It refers to the X coordinate of the upper left corner in algorithm ROI.

_ Draw ROI Offset Y: It refers to the Y coordinate of the upper left corner in algorithm ROI.

6. (Optional) Adjust or clear generated ROI regions by configuring the following parameters:

_ Modify the configured algorithm ROI: Click the algorithm ROI to be modified in the preview window, or select the specific algorithm ROI in the ROI options, then adjust the size and position of the green window according to actual needs. You can also adjust the algorithm ROI by modifying values in the four parameters: Draw ROI Width, Draw ROI Height, Draw ROI Offset X, and Draw ROI Offset Y.

_ Restore Max. Algorithm ROI: Click Execute in Restore Max. Algorithm ROI to restore the ROI to the full screen.

_ Clear All ROI: Click Execute in Clear All ROI to delete all ROIs.

_ Delete a single ROI: Right-click the specific algorithm ROI to be deleted in the preview window, then click Delete.

7. (Optional) Enable the ROI Link IO Enable parameter under the Algorithm Control property in the Property Tree. When any ROI area fails to read a barcode, the associated output device will provide an output prompt. During actual use, ensure that the output device is connected.

Code Algorithm Settings

Draw ROI in Batch

Steps：

1. Make sure that the output device is connected when using this function.

2. Go to Algorithm Settings, click All Features, and find Algorithm ROI.

3. Click Batch to set parameters according to actual demands.

_ Area Offset: It sets the pixel quantity from the starting point when the ROI is in horizontal and vertical direction from the full resolution.

_ Area Size: It sets the pixel quantity in the horizontal and vertical direction of the ROI.

_ ROI Number: It sets the row and column quantity.

_ Row Spacing: It sets the interval between rows.

_ Column Spacing: It sets the interval between columns.
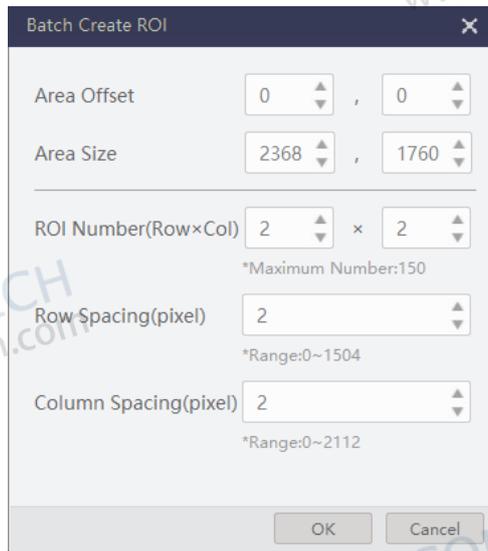
4. Click OK after settings.

5. Repeat other optional steps mentioned in drawing single group of ROI according to actual demands.

6. (Optional) Enable ROI Link IO Enable in Algorithm Control, and there will be prompts by the output device when codes are not read in any ROI.Make sure that the output device is connected when using this function.

Code Algorithm Settings

Draw ROI via Chessboard

Steps:

1. Make sure that the output device is connected when using this function.

2. Go to Algorithm Settings, click All Features, and find Algorithm ROI.

3. Click Execute in Chessboard ROI, set parameters according to actual demands, and click OK after setting.
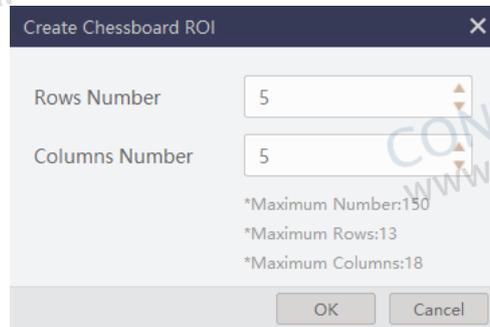
4. Click ✔ after creating ROI, and the red frame becomes green as shown below.

_ Adjust the size and position of the ROI: Place the mouse cursor on the outer border of the algorithm ROI area, then adjust the overall size and position of the algorithm ROI area as needed.

_ Click ⊞ to restore the ROI to the full screen;

_ Click ✕ to clean all configured ROIs.
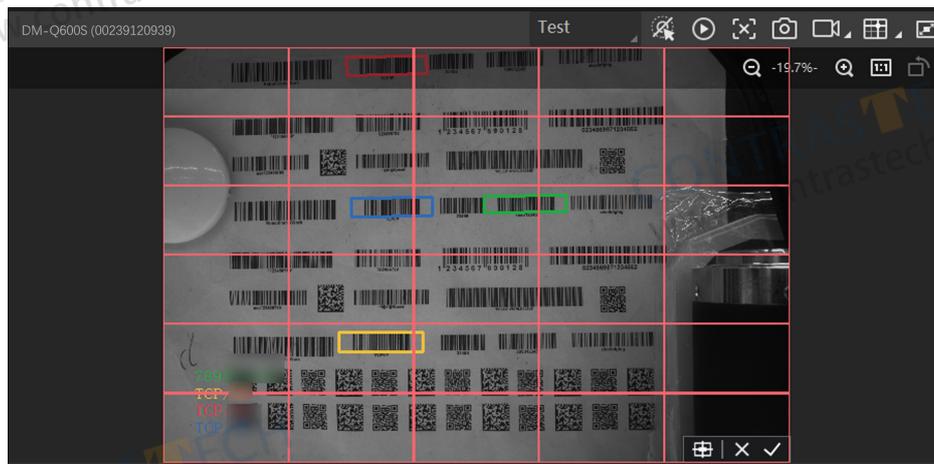
5. Repeat other optional steps mentioned in drawing single group of ROI according to actual demands.

6. (Optional) Enable ROI Link IO Enable in Algorithm Control, and there will be prompts by the output device when codes are not read in any ROI.Make sure that the output device is connected when using this function.

ℹ	● When all algorithm ROI areas are disabled, the current algorithm ROI area defaults to full-screen. ● When some algorithm ROI areas are enabled and others are disabled, the disabled algorithm ROI areas actually correspond to an image region of 128×128 pixels located at the top-left corner (0, 0). ● The figures above are for reference only, and refer to the actual conditions.

Code Algorithm Settings

■ Algorithm Parameter

Select 1DCode, 2DCode, or StackCode from the drop-down menu of the "Algorithm Type" parameter. 1DCode corresponds to 1D barcode algorithm parameters, 2DCode corresponds to 2D barcode algorithm parameters, and StackCode corresponds to stacked barcode algorithm parameters.

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

1D Code Algorithm Parameter

● Timeout Value：The code reader will stop parsing the images and return results if the time is exceeded the waiting time configured. When the parameter is set to 0, it is subject to the actual algorithm timeout, and its unit is ms.

● Code Color: It defines the readable code color. White Code On Black Wall means that the client software can recognize the white code with black background. Black Code On White Wall means that the client software can recognize the black code with white background.

● Code 39 Check: Enable this parameter if Code 39 uses the parity bit.

● ITF 25 Check: Enable this parameter if ITF 25 uses the parity bit.

● 1D 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.

● GS1 Format Parsing: When enabled, reading a GS1 barcode will trigger GS1 format parsing (with parentheses); when disabled, the barcode data will be output as-is.

2D Code Algorithm Parameter

● Timeout Value：The code reader will stop parsing the images and return results if the time is exceeded the waiting time configured. When the parameter is set to 0, it is subject to the actual algorithm timeout, and its unit is ms.

● Running Mode：It includes High Speed, High Performance, and Balance.

● 2D Code Max. Size：It refers to the max. recognizable code width. The 2D code will not be recognized if its width exceeds the configured value.

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

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

● Code Color: It defines the readable code color. White Code On Black Wall means that the client software can recognize the white code with black background. Black Code On White Wall means that the client software can recognize the black code with white background.

● Discrete Flag：The default value of this parameter is Continuous, which parses continuous codes. Typically, the minimum module of a continuous code is composed of squares, while the minimum module of a discrete code is composed of dots. If there are gaps between the minimum modules, set this parameter to Discrete to parse discrete codes. When configured as Adaptive, it is compatible with both continuous and discrete codes, and the algorithm library will make autonomous judgments.

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

● DM Code Shape：The default value of this parameter is Square (i.e., square code). When the DM code to be recognized is rectangular, set the parameter to Rectangle. If configured as Adaptive, it is compatible with both square and rectangular codes, and the algorithm library will make autonomous judgments.

● 2D Code Quality Enable：Enables grade evaluation for 2D barcode quality. When this function is enabled, after the device completes code reading, the client will output and display the overall evaluation grade. Currently, the 2D coding rating function supports only DM and QR codes.

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

● Accurate Timeout Enable：If it is enabled, the accuracy of algorithm timeout will improve.

● GS1 Format Parsing: When enabled, reading a GS1 barcode will trigger GS1 format parsing (with parentheses); when disabled, the barcode data will be output as-is.

Stacked Code Algorithm Parameter

● Timeout Value：The code reader will stop parsing the images and return results if the time is exceeded the waiting time configured. When the parameter is set to 0, it is subject to the actual algorithm timeout, and its unit is ms.

● Code Score Enable: If it is enabled, the client software will evaluate the code reading environment for stacked code and output code score.

● Accurate Timeout Enable：If it is enabled, the accuracy of algorithm timeout will improve.

Code Algorithm Settings

■ Code Quality Evaluation

The code quality evaluation function judges the quality of codes and outputs overall grade. Currently, only 1D code and 2D code support code quality evaluation.

i	When multiple barcodes appear in the target field of view, simultaneous rating of multiple barcodes is supported.

1D Code Quality Evaluation

The 1D quality evaluation function uses the ISO15416 standard to judges the quality of codes and outputs overall grade. Currently, Code39, Code128, ITF14, ITF25, EAN8, EAN13, and UPCA barcodes are supported. The specific setup methods are as follows:

1. Go to Algorithm Control → Algorithm Parameter

2. Enable 1D Code Quality Evaluation.

3. Enable different quality evaluation standards according to actual demands.

Parameter	Description
Decodability	It evaluates whether the code has enough basic information to be decoded.
Contrast	It evaluates the difference between the max. brightness value and the min. brightness value of the code area.
Modulation	It evaluates the degree of change in terms of brightness.
Edge Determination	It evaluates how well the number of edges read by the code matches the configured number of edges.
Minimum Reflectance	It evaluates the ratio of the min. brightness value to the max. brightness value.
Minimum Edge Contrast	It evaluates the min. value of the reflectivity difference of the strip connecting the spaces.
Decode Enable	It evaluates whether the code recognition is successful or not.
Defects	It evaluates codes or spaces for defects or dirts.

4. Set the evaluation value for A/B/C/D grade according to actual demands.

If the actual code reading value of the device is greater than the grade A evaluation value, and then the evaluation standard is grade A. If the actual code reading value is between grade A and grade B, and then the evaluation standard is grade B. If the actual code reading value is between grade B and grade C, and then the evaluation standard is grade C. If the actual code reading value is between grade C and grade D, and then the evaluation standard is grade D. If the actual code reading value is lower than the D grade, and then the evaluation standard is F grade.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.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.

5. (Optional) Set Quality 1D Max Num to configure the amount of code to be evaluated. If the actual amount of code exceeds the configured, the later codes will not be evaluated.
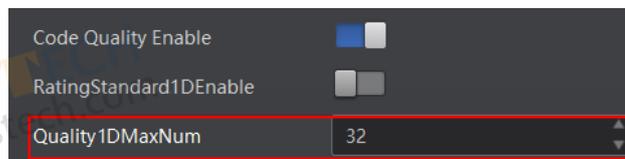
6. (Optional) Go to Algorithm Control → Rating Standard 1D Enable, set enable Rating Standard 1D Enable, and select 1D Rating Standard.

For example, if 1D Rating Standard is C, and then the client software will output codes with A/B/C grade and codes with D/F will be filtered.

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

No.	Read Time	Output Total Cos	Cost Time(ms)	PPM	Barcode Type	Waybill	Barcode Content	Overall Gra	Code Score
71	2023/6/25 17:12:54:417	4981742	121	14.6	QRCode		313200953002023…	A	61
70	2023/6/25 17:12:54:417	4981742	121	5.8	Code 128		1.000	F	65
69	2023/6/25 17:12:54:417	4981742	121	6	Code 128			F	66

i	The 1D code marking Code Quality Enable is only displayed when the operation mode is in Normal mode.

Code Algorithm Settings

2D Code Quality Evaluation

The 2D quality evaluation function uses the ISO15415 standard to judges the quality of codes and outputs overall grade.

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

Before You Start：

Make sure that the device's operation mode is normal and 2D codes added.

Steps：

1.Go to Algorithm Control → Algorithm Parameter, and select 2D Code as Arithmetic Type.

2.Enable 2D Code Quality Evaluation.

3.Set Iso Edition, including Iso15415 and Iso29158

4.Set Verify Edition, and Standard Mode is optional as the standard quality evaluation mode.

5. Enable different quality evaluation standards according to actual demands.

Parameter	Description
Decodability	It evaluates whether the code has enough basic information to be decoded.
Contrast	It evaluates the difference between the max. brightness value and the min. brightness value of the code area.
Modulation	It evaluates the degree of change in terms of brightness.
Positioning pattern damage	It evaluates the damage of the Evaluation code format, including the positioning format of the code, clear zone, clock, and other fixed formats.
Axial non-uniformity	It evaluates the distortion degree of the barcode's vertical and horizontal dimensions.
Unused error correction	Evaluate whether there are damaged cell modules in the barcode, which reduces the barcode's error correction capability.
Non-uniform grid	Evaluate the distortion degree of cell modules within the barcode.
Printing stretch	Evaluate whether the size of each cell in the barcode is uniform.

6. Set the evaluation value for A/B/C/D grade according to actual demands.

If the actual code reading value of the device is greater than the grade A evaluation value, and then the evaluation standard is grade A. If the actual code reading value is between grade A and grade B, and then the evaluation standard is grade B. If the actual code reading value is between grade B and grade C, and then the evaluation standard is grade C. If the actual code reading value is between grade C and grade D, and then the evaluation standard is grade D. If the actual code reading value is lower than the D grade, and then the evaluation standard is F grade.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.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.

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

Code Algorithm Settings

■ Code Score

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

In test mode, this function is enabled by default. In normal mode, you need to enable it manually.
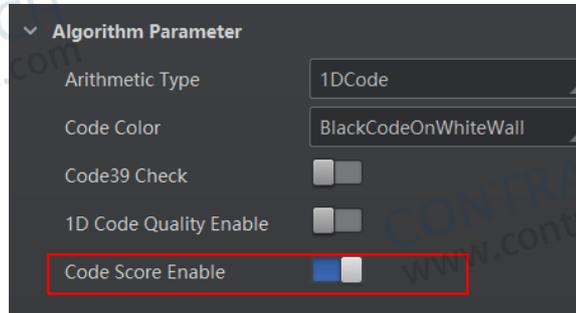
Click to start acquisition, and the client software will display specific code score in the history area.

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

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.

Go to Image Settings, and adjust parameters like exposure time, gain, Gamma, light source, etc. if the code score is low.If the code score is still low after adjusting, and the code may have poor printing quality.

ℹ	The function of code score may differ by device models.

Signal Input Settings

The input settings allow you to configure the trigger related parameters. You can enable trigger mode to let the acquisition of image data occur only when the trigger source is generated.

> ℹ The function that can be set may differ by device model.

■ Input

The input section allows you to set whether the device turns on the trigger mode, select the trigger source and set the related parameters.

The method of setting the input signal is as follows:

1. Pull down the Trigger Mode to select On.

2. Select the corresponding trigger source according to the actual demand, please refer to the following table for each trigger source and its working principle.

Trigger Source	Description
Software	The trigger signal is generated by software and transmitted to the code reader via GigE for image acquisition.
Line 0/1/2 Input (Hardware Trigger)	An external device connects to the code reader via an I/O interface, sending a trigger signal for image acquisition.
Counter 0	The code reader receives signals from a counter for image acquisition.
TCP server	The code reader acts as a TCP server, receiving TCP commands from an external device to trigger image acquisition.
UDP Trigger	The code reader receives UDP commands from an external device to trigger image acquisition.
Serial Trigger	The code reader receives serial commands from an external device to trigger image acquisition.
Self Trigger	Image acquisition is performed automatically based on a configured time interval and number of cycles.
Master-Slave Trigger	When the master code reader is triggered, the signal is transmitted to slave code readers. ℹ • Enable master-slave mode when selecting this trigger source. • Set the trigger source of slave readers to "Master Device" and enable command-trigger mode on the master reader.
Brightness Tigger	Automatic code reading and barcode output are triggered when ambient brightness changes. The camera monitors real-time brightness values, initiating code reading when fluctuations exceed a configured sensitivity threshold.

3. Configure corresponding parameters based on the selected trigger source, as described below.

> ℹ Only partial parameters can be configured in the input section, while complete parameter settings can be made under the Property Tree I/O Control attributes.

Common Parameters:

- Trigger Delay: Set the trigger delay time according to actual requirements, in µs. The default is 0, meaning the device triggers image acquisition immediately upon receiving the input signal. The principle of trigger delay is shown in the figure below.
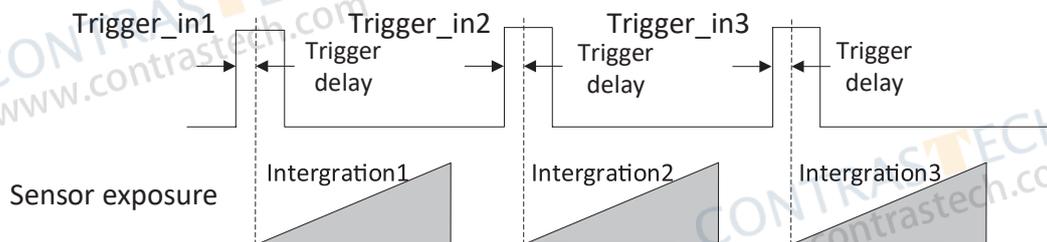

- Trigger Cache: Select whether to enable the trigger cache function. When enabled, the code reader retains new trigger signals while processing the current one, queuing them for handling. This ensures no trigger signals are lost when processing multiple inputs.

Signal Input Settings

● Software Trigger: If "Software Trigger" is selected as the trigger source, you can:

Manually initiate the trigger by clicking the Execute button in the software trigger parameters.Enable automatic triggering using the Auto Trigger Time and Enable Auto Trigger parameters, as shown in the figure below
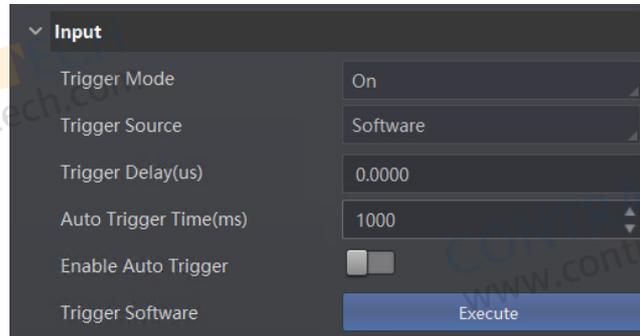

● LineIn 0/1/2： Debounce time can be set to filter input signals, and trigger masking can be configured to block new triggers for a specified period.

> ℹ️ When the trigger masking switch is enabled, the trigger cache function cannot be activated.
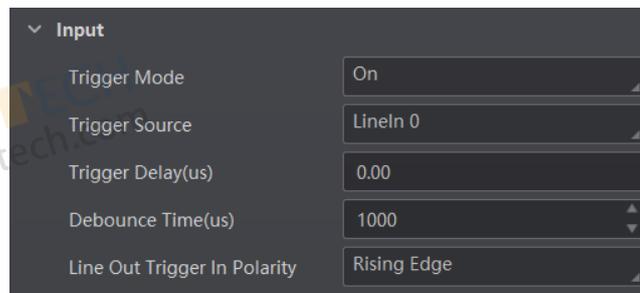
The principle of the debounce timing is shown in the figure below. If the set debounce time is longer than the trigger signal pulse width, the trigger signal will be ignored. If the set debounce time is shorter than the trigger signal pulse width, the trigger signal will be delayed and then output.
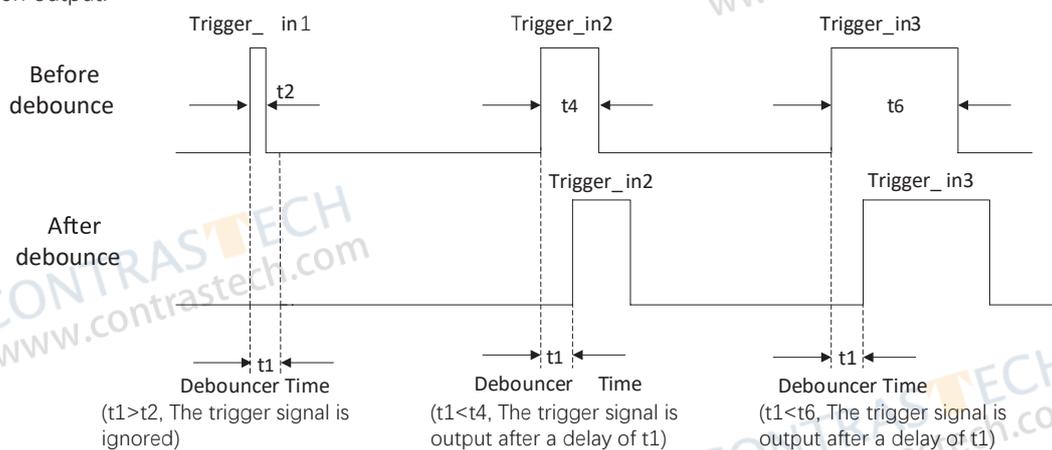
When the LineOut event is set to Communication Character Control, TCP protocol-related parameters can be configured under Property Tree > Trigger I/O Control to set the communication command mode.

*   TCP Server Start Trigger Port: Set the TCP server port number for data transmission.
*   TCP Server Output Echo: Select whether to return the output result to the triggering device.
*   TCP Client Trigger IP Address: Set the IP address of the TCP server for data transmission.
*   TCP Client Trigger Port: Set the TCP server port number for data transmission.
*   TCP Client Output Echo: Select whether to return the output result to the triggering device.
*   Continuous Command Trigger: Set whether the code reader remains in a continuous trigger state until a corresponding stop trigger command is received. When this parameter is enabled, you can configure the Trigger Start Delay and Trigger End Delay parameters to set the waiting time from receiving the trigger signal to starting or ending image acquisition.

Signal Input Settings

● Counter 0:Configure the count number, count source, and hard trigger activation parameters as needed. The count number ranges from 1 to 1023, and the count source can be selected as LineIn 0/1/2, as shown in the figure below.

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

● TCP Server:Configure the following TCP trigger parameters

∨ Input	
Trigger Mode	On
Trigger Source	TCP Start
Trigger Delay(us)	0.00
TCP Trigger Port	2001
TCP Start Trigger Text	start

- TCP Trigger Port: Set the TCP server port number for receiving TCP trigger commands.

- TCP Start Trigger Text Format: Set the TCP trigger character format (String or Hexadecimal).

- TCP Start Trigger Text: Define the TCP trigger command in the selected format (String or Hexadecimal). When Hexadecimal is selected, click the edit button on the right to open a Hexadecimal ASCII Lookup Table for selection.

- Fuzzy Trigger: When enabled, the trigger activates if the sent text contains the start trigger text, and stops if it contains the stop trigger text. Note: If the start and stop trigger texts include each other, only exact matching is supported for start and stop triggers, and fuzzy triggering is no longer enabled.

- Continuous Command Trigger: Set whether the code reader remains in a continuous trigger state until a stop command is received. Enabling this parameter allows configuration of Trigger Start Delay and Trigger End Delay to set the waiting time from receiving the trigger signal to starting/ending image acquisition.

● UDP Trigger:Configure the following UDP trigger parameters

∨ Input	
Trigger Mode	On
Trigger Source	UDP Start
Trigger Delay(us)	0.00
UDP Trigger Port	2002
UDP Start Trigger Text	start

- UDP Trigger Port: Set the host port number for UDP trigger commands.

- UDP Start Trigger Text Format: Select the format for UDP trigger characters (String or Hexadecimal).

- UDP Start Trigger Text: Define the trigger command in the selected format. When Hexadecimal is chosen, click the edit button on the right to access a Hexadecimal ASCII reference table.

- Fuzzy Trigger: When enabled, the system triggers if the sent text contains the start trigger text and stops if it contains the stop trigger text. Note: If start and stop texts overlap, exact matching is required, and fuzzy triggering is disabled.

- Continuous Command Trigger: Set the code reader to maintain a continuous trigger state until a stop command is received. Enable this to configure Trigger Start Delay and Trigger End Delay for timing adjustments between signal receipt and image acquisition.

Signal Input Settings

● Serial Trigger:Configure the following serial port trigger parameters

- Serial Baudrate: Set the baud rate for serial communication.
- Serial Data Bits: Configure the number of data bits.
- Serial Parity: Set the parity check type.
- Serial Stop Bits: Configure the number of stop bits.
- Serial Start Trigger Text: Select the format for trigger characters (String or Hexadecimal). Start Trigger Text: Define the trigger command in the selected format. Click the edit button for a Hexadecimal ASCII reference when using Hexadecimal format.

ℹ	Hexadecimal is only supported when Data Bits is set to 8.

- Start Trigger Text: Define the trigger command in the selected format. Click the edit button for a Hexadecimal ASCII reference when using Hexadecimal format.
- Fuzzy Trigger: When enabled, triggers on any text containing the start command and stops on text containing the stop command. Exact matching is required if start/stop texts overlap.
- Continuous Command Trigger: Maintain a continuous trigger state until a stop command is received. Configure Start Delay and End Delay for timing adjustments.

● Self Trigger:Self Trigger Period: Set the interval between automatic triggers (must be greater than the reciprocal of the actual frame rate; values below this threshold will be automatically adjusted).

Self Trigger Count: Set the number of triggers before stopping (0 = infinite triggers until manually stopped).

ℹ	● When the self trigger count is set to 0, it means infinite triggering is allowed until the self trigger stop command is executed. ● The self trigger time should be set to a value greater than the reciprocal of the actual frame rate. If it is smaller, the self trigger period will be forced to the reciprocal of the actual frame rate. ● The functions supported by the device are related to the device model and firmware program. Please refer to the actual parameters for details.

Signal Input Settings

● TCP Client: Configure the following trigger parameters

• TCP Client Trigger IP Address: Set the IP address of the host for TCP triggering.

• TCP Client Trigger Port: Set the TCP server port number for receiving trigger commands.

• TCP Client Start Trigger Text Format: Select the format for trigger characters (String or Hexadecimal).

• TCP Client Start Trigger Text: Define the trigger command in the selected format. Click the edit button for a Hexadecimal ASCII reference when using Hexadecimal format.

• Fuzzy Trigger: When enabled, triggers on any text containing the start command and stops on text containing the stop command. Exact matching is required if start/stop texts overlap.

• Continuous Command Trigger: Maintain a continuous trigger state until a stop command is received. Configure Start Delay and End Delay for timing adjustments.

● Brightness Trigger: Configure the following trigger parameters

• Brightness Trigger Sensitivity: Adjust the sensitivity to brightness changes (higher values = greater sensitivity).

• Brightness Blanking Time (ms): Set the duration after a brightness-triggered read during which the device ignores new changes to prevent repeated triggers from transient light fluctuations.

• Brightness Timeout (ms): Set the maximum wait time for code reading after detecting a brightness change. The device stops waiting if decoding is incomplete after this period.

Signal Input Settings

■ Stop Trigger

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

Stop Trigger via IO

You can stop a trigger via IO: Enabling IO Stop Trigger Enable first, select specific sources from IO Stop Trigger Selector, and then s the trigger polarity as the condition to stop trigger.
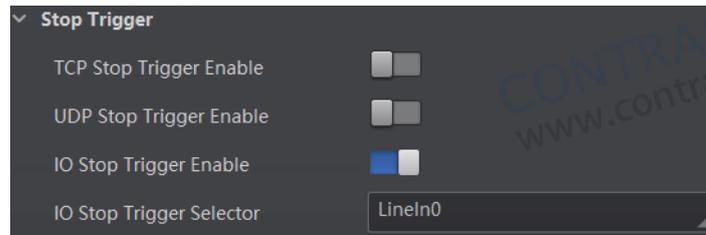
When selecting SoftwareTriggerEnd as IO Stop Trigger Selector, you can click Execute in Software Stop Trigger to stop current trigger.
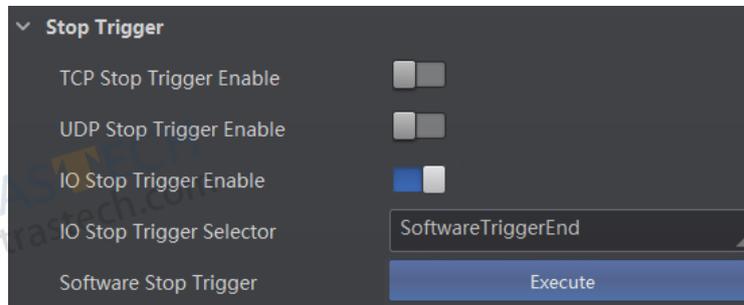
Stop Trigger via Serial

When the specified serial port receives the specified string text, the trigger will be stopped. The client software sends stop trigger command to the device after Serial Stop Trigger Enable is enabled.
You should enter Serial Stop Trigger Text, Serial Baudrate, Serial Data Bits, Serial parity, and Serial Stop Bits according to actual demands. The Serial Baudrate includes 4800, 9600, 19200, 38400, 57600 and 115200, and Serial Data Bits is 8.
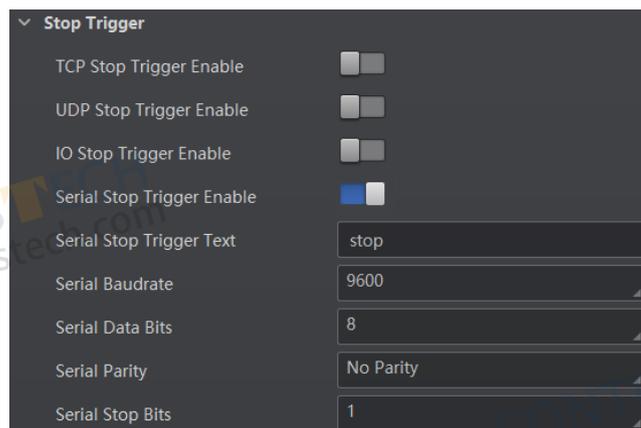
Stop Trigger via UDP

When the UDP server receives the specified string text, the trigger will be stopped. The client software sends stop trigger command to the device after Udp Stop Trigger Enable is enabled. You should enter Udp Trigger Port and Udp Stop Trigger Text according to actual demands. The range of Udp Trigger Port is from 1025 to 65535, and the default port is 2002.
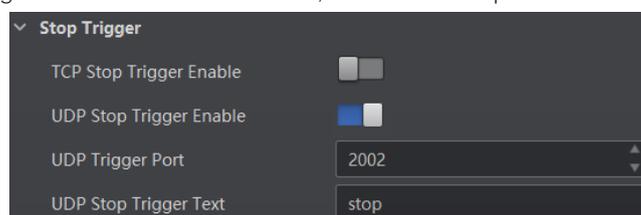
Signal Input Settings

Stop Trigger via TCP

When the TCP server receives the specified string text, the trigger will be stopped. The client software sends stop trigger command to the device after Tcp Stop Trigger Enable is enabled. You should enter Tcp Trigger Port and Tcp Stop Trigger Text according to actual demands. The range of Tcp Trigger Port is from 1025 to 65535, and the default port is 2001.

Stop Trigger	
TCP Stop Trigger Enable	
TCP Trigger Port	2001
TCP Stop Trigger Text	stop

Stop Trigger via Timeout Duration

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

When the trigger time reaches the specified maximum value (in ms), the trigger will be stopped. You can enable TimeOut Stop Trigger Enable, and set Maximum Output Limited Time according to actual demands. The range of Maximum Output Limited Time is 0 to 10000 ms.

TimeOut Stop Trigger Enable	
Maximum Output Limited Time(ms)	10000

Stop Trigger via Code Number

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

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

● If the outputted code quantity is smaller than configured CodeNum Stop Trigger Min, and the device will output codes continuously.

● If the outputted code quantity is smaller than configured CodeNum Stop Trigger Max, and the device will stop outputting codes.

● If the outputted code quantity is between configured CodeNum Stop Trigger Min and CodeNum Stop Trigger Max, and the device will read and output codes according to trigger signals.

● If CodeNum Stop Trigger Min is same with CodeNum Stop Trigger Max, and the device will stop outputting codes when the number of outputted codes reaches the configured number.

CodeNum Stop Trigger Enable	
CodeNum Stop Trigger Min	1
CodeNum Stop Trigger Max	3

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.
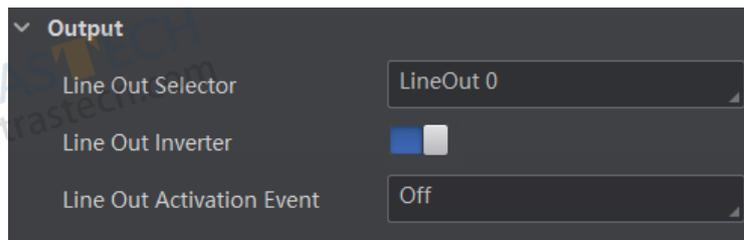
Output	
Line Out Selector	LineOut 0
Line Out Inverter	
Line Out Activation Event	Off
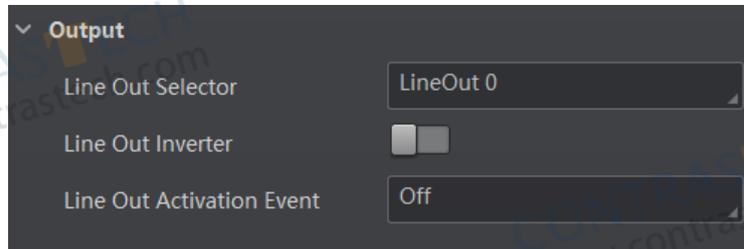
▇ Enable Line Inverter

The level 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.

> ℹ The Line Out Inverter function is disabled by default.

Output	
Line Out Selector	LineOut 0
Line Out Inverter	
Line Out Activation Event	Off

▇ Set Event Source

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, Acquisition Start Active, Acquisition Stop Active, Frame Burst Start Active, Frame Burst Stop Active, Exposure Start Active, Soft Trigger Active, Hard Trigger Active, Counter Active, Timer Active, No Code Read, Read Success, and Light Strobe Long.

> ℹ You need to set different parameters when selecting these event sources.
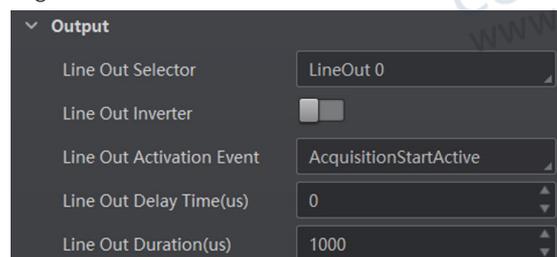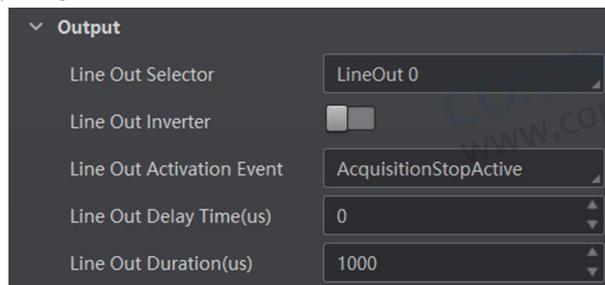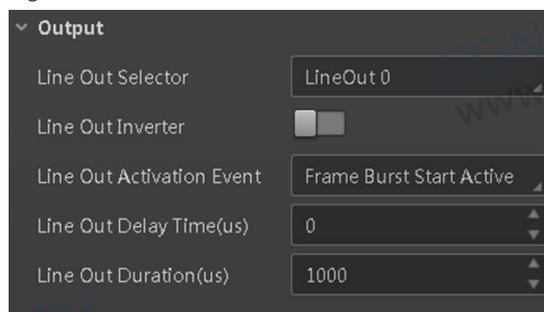
Select Acquisition Start Active
If acquisition starts, the output signal will be triggered. When you select Acquisition Start Active as Line Out Activation Event, you can set its output delay time and duration.

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.

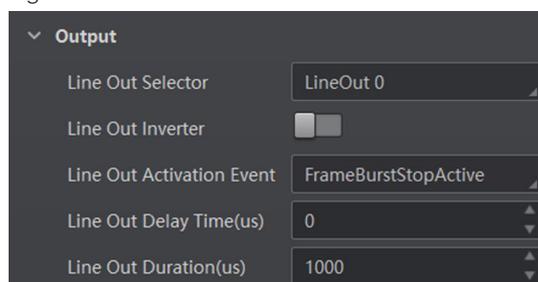| Output	
Line Out Selector	LineOut 0
Line Out Inverter	
Line Out Activation Event	AcquisitionStartActive
Line Out Delay Time(us)	0
Line Out Duration(us)	1000

Signal Output Settings

Select Acquisition Stop Active

If acquisition stops, the output signal will be triggered. When you select Acquisition Stop Active 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.

∨ Output	
Line Out Selector	LineOut 0
Line Out Inverter	◼◻
Line Out Activation Event	AcquisitionStopActive
Line Out Delay Time(us)	0
Line Out Duration(us)	1000

Select Frame Burst Start Active

> ℹ️ The Frame Burst Start Active is not supported when the trigger polarity is level high or level low.

If the burst of a frame starts, the output signal will be triggered. When you select Frame Burst Start Active 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.

∨ Output	
Line Out Selector	LineOut 0
Line Out Inverter	◼◻
Line Out Activation Event	Frame Burst Start Active
Line Out Delay Time(us)	0
Line Out Duration(us)	1000

Select Frame Burst Stop Active

> ℹ️ The Frame Burst Stop Active is not supported when the trigger polarity is level high or level low.

If the burst of a frame stops, the output signal will be triggered. When you select Frame Burst Stop Active 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.

∨ Output	
Line Out Selector	LineOut 0
Line Out Inverter	◼◻
Line Out Activation Event	FrameBurstStopActive
Line Out Delay Time(us)	0
Line Out Duration(us)	1000

Signal Output Settings

Select Exposure Start Active

ℹ️ For different models of device, when selecting Exposure Start Active as Line Out Activation Event, the specific paramete[r] may be different. The actual product you purchased shall prevail.

If you select Exposure Start Active as Line Out Activation Event, you can set its output delay time, duration, and ahead time.
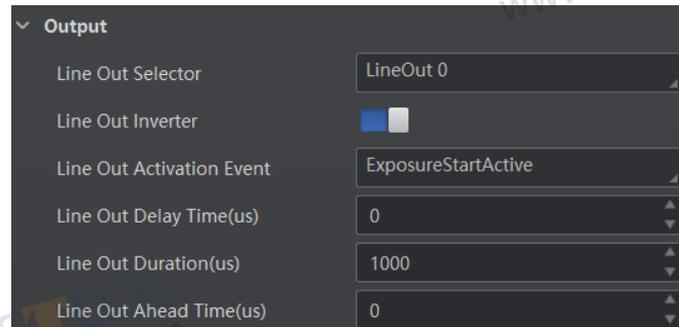
Line Out Delay Time

It sets the delay time for outputting the signal.

Line Out Duration

It sets the duration for outputting the signal.

Line Out Ahead Time

It sets the ahead time for outputting the signal.

⌄ Output	
Line Out Selector	LineOut 0
Line Out Inverter	🔵⬜
Line Out Activation Event	ExposureStartActive
Line Out Delay Time(us)	0
Line Out Duration(us)	1000
Line Out Ahead Time(us)	0

Select Soft Trigger Active

If you select Soft Trigger Active as Line Out Activation Event, you can set its output delay time, duration, and execute outputting signal manually.

Line Out Delay Time

It sets the delay time for outputting the signal.

Line Out Duration

It sets the duration for outputting the signal.

Line Trigger Software

Click Execute for manually outputting the output signal.

⌄ Output	
Line Out Selector	LineOut 0
Line Out Inverter	⬜⬜
Line Out Activation Event	Soft Trigger Active
Line Trigger Software	Execute
Line Out Delay Time(us)	0
Line Out Duration(us)	1000
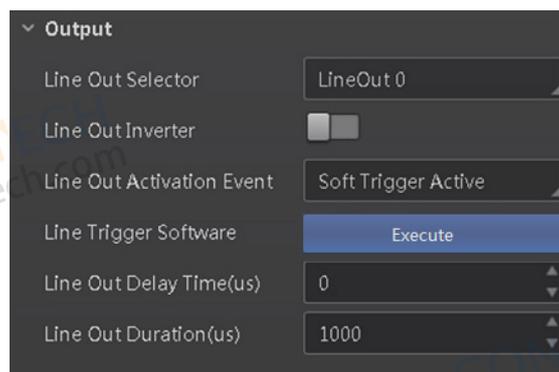
Signal Output Settings

Select Hard Trigger Active

If you select Hard Trigger Active as Line Out Activation Event, you can set its output delay time, duration, trigger source, and trigger activation.

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.

Hardware Trigger Source

It sets the hardware trigger source, including LineIn 0, LineIn 1, and LineIn 2.

Hardware Trigger Activation

It sets the trigger activation of input signal, including Rising Edge and Falling Edge.

Select Counter Active

Counter active means that the counter triggers the output signal. When you select Counter Active 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.

Select Timer Active

If you select Timer Active 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.

Signal Output Settings

Select No Code Read

If you select No Code Read 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.

∨ Output	
Line Out Selector	LineOut 2
Line Out Inverter	
Line Out Activation Event	NoCodeRead
Line Out Delay Time(us)	0
Line Out Duration(us)	1000

Select Read Success

If you select Read Success 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 duration for outputting the signal.

∨ Output	
Line Out Selector	LineOut 2
Line Out Inverter	
Line Out Activation Event	ReadSuccess
Line Out Delay Time(us)	0
Line Out Duration(us)	1000

Select Light Strobe Long

If you select Light Strobe Long as Line Out Activation Event, you do not need to set any parameters.

Code Reading Result Settings

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

■ Set Code Reading Result Output Mode

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

● Instant output mode means that the device can instantly output code reading results when recognizing codes if you enable Instant Output Mode Enable in Filter Rule.

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

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

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

■ Set Filter Rule

You can set rules to filter unwanted barcodes to improve the reading efficiency in Filter Rule. Two filter modes are available, including normal mode and regular expression mode. You can set it in Filter Mode.

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

Normal Filter Mode

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

Instant Output Mode Enable

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

Min. Output Time

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

Numeral Filter

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

Max Output Length

It sets the max. code length that can be outputted.

Code Offset Num

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

Begin with Specific Character for Result

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

Include Specific Character in Barcode

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

Exclude Specific Character in Barcode

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

Min. Code Length

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

Max. Code Length

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

Code Reading Result Settings

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 reading result will be outputted. Or the barcode will be regarded as invalid and its reading result 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.

Regular Expression Filter Mode

Instant Output Mode Enable

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

Min. Output Time

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

Max Output Length

It sets the max. code length that can be outputted.

Code Offset Num

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

Regular Expression

It selects the regular expression from order 1 to order 10. You can enter specific regular expression contents in Regular Expression Filter. Up to ten regular expression rules can be set at the same time. Once one regular expression is met, code can be outputted.

Regular Expression Filter

It sets the specific regular expression contents.

Min. Code Length

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

Max. Code Length

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

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 reading result will be outputted. Or the barcode will be regarded as invalid and its reading result will not be outputted.

Filter Rule	
Instant Output Mode Enable	
Min Output Time(ms)	0
Filter Mode	Regular Expression
Max Output Length	256
Code Offset Num	0
SortOnExpressSortSet	order1
Regular Expression Filter	
Min Code Length	1
Max Code Length	256
Read Times Threshold	1

Code Reading Result Settings

■ Set Result Format

Result format settings allow you to set the format and contents contained in the outputted barcode information. Result format is related to communication protocol and trigger mode. With different selected communication protocol and trigger mode, you need to set corresponding parameters.

> ℹ
> ● Result format settings are only available if you select Smart SDK, TCP Client, TCP Server, Serial, FTP, Melsec,ModBus, Fins, and SLMP as the communication protocol when the device mode is Normal.
> ● For details about communication protocol, see section Communication Settings for details.
> ● The specific parameter names and values may differ by device firmware versions.

Result Output via Smart SDK

When the communication protocol is Smart SDK, device mode is Normal and trigger mode is On, you can set following parameters.

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.

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.

Result Output via FTP

The device also supports using the FTP communication protocol to send and receive data, and you can select it to output information. The configurable parameters below are related to the trigger mode, and here we take the external trigger mode as an example.

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

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.

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.

Code Reading Result Settings

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.

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

FTP Picture Name Content

It selects what contents you want to display in FTP file name, including code content, code type, frame number, etc. You can select multiple contents as desired, and the selected contents will be displayed below.

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 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 Result Prefix

It sets the prefix of FTP file name, including No, Result and All. No stands for no prefix for file name, and all images are saved in FTP root directory. Result stands for all images that code reading successfully will be saved in Read directory, and all images that code reading failed will be saved in Noread directory. All stands for all images will be saved in All directory.

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.

Code Reading Result Settings

Result Output via Other Communication Protocols

When the communication protocol is TCP Client, TCP Server, Serial, Melsec, ModBus, Fins or SLMP, device mode is Normal and trigger mode is On, you can set following parameters.

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

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.

ROI Output NoRead Enable

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

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.

Code Pos Width Enable

If it is enabled, you can add 0 to codes if the code coordinate does not meet specified length.

Code Pos Width

You can enter the length of the code coordinate after enabling Code Pos Width Enable.

CodeNum End Trigger Min

If it is enabled, the device will stop triggering and save the current image when the code recognized by the device does not meet the min. length requirement.

Contrast Control Settings

> ℹ️ You need to set device 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.

> ℹ️ 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.

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.

> ℹ️ ● 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).

Communication Settings

The communication protocol is used to transmit and output code reading result and image. The communication protocol is related to the device modes. With various device modes, the device supports different communication protocols and corresponding parameters. When the device mode is Test or Raw, the device only supports Smart SDK protocol and no parameter settings are required. While in Normal mode, the device supports Smart SDK, TCP Client, TCP Server, Serial, FTP, Melsec, ModBus, Fins and SLMP communication protocols, and you need to set corresponding parameters.

> ℹ️ The specific communication parameters may differ by device models and firmware.

◼ Smart SDK

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

Encode JPG Flag

If enabled, the device will compress the image data.

Quantity of Jpg

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

Communication Protocols	SmartSDK
∨ **SmartSDK**	
SmartSDK Protocol	⬤
Encode JPG Flag	⬤
Quality of JPG	60
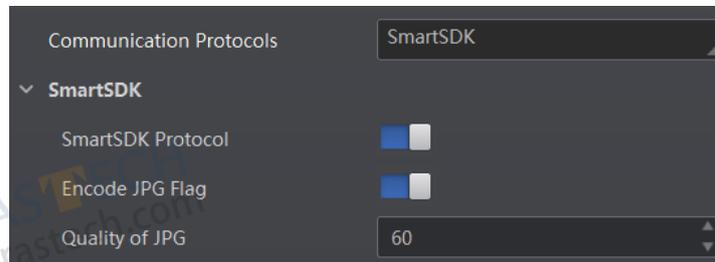
◼ TCP Client

The TCP includes TCP Server and TCP Client. If TCP Client is selected as the Communication Protocols, you can enable TCP Protocol, and enter TCP Dst Addr and TCP Dst Port.

Communication Protocols	TCP Client
∨ **TCPClient**	
TCP Protocol	⬤
TCP Dst Addr	0.0.0.0
TCP Dst Port	5000
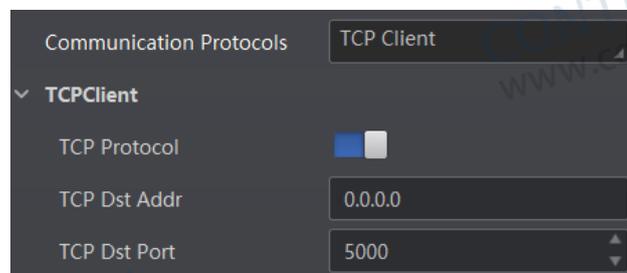
◼ TCP Server

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

Communication Protocols	TCP Server
∨ **TCPServer**	
TCP Server Enable	⬤
TCP Server Port	2002
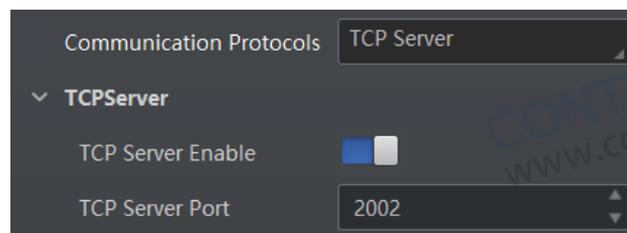
Communication Settings

■ Serial

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

Communication Protocols	Serial
∨ **Serial**	
Serial Protocol	
Serial Baudrate	9600
Serial Data Bits	8
Serial Parity	NoParity
Serial Stop Bits	1

■ FTP

If FTP is selected as the Communication Protocols, you can enable FTP Protocol, enter FTP Host Addr, FTP Host Port, FTP User Name, and FTP User PWD.

Communication Protocols	FTP
∨ **FTP**	
FTP Protocol	
FTP Host Addr	0.0.0.0
FTP Host Port	21
FTP User Name	
FTP User PWD	

■ MELSEC

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

MELSEC Destination Address

It sets the IP address of the target PLC.

MELSEC Destination Port

It sets the port number of the target PLC.

MELSEC Data Base Address

It sets the first address of the data area.

MELSEC State Base Address

It sets the first address of the status area.

MELSEC Network Number

It sets the network No.

MELSEC PLC Number

It sets the PLC No.

MELSEC Module I/O Number

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

MELSEC Module Station Number

It displays the module station number.

MELSEC Timeout

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

Communication Protocols	MELSEC
∨ **MELSEC**	
MELSEC Protocal Enable	
MELSEC Destination Address	0.0.0.0
MELSEC Destination Port	1024
MELSEC Data Base Address	0
MELSEC State Base Address	0
MELSEC Network Number	0
MELSEC PLC Number	0xff
MELSEC Module I/O Number	0x3ff
MELSEC ModuleStation Number	0x0
MELSEC Timeout	0x1

Communication Settings

■ ModBus

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

ModBus Mode

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

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

ModBus Control Address Space

It is holding_register by default.

ModBus Control Address Offset

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

ModBus Control Data Number

It is 2 by default.

ModBus State Address Space

It is input_register by default.

ModBus State Address Offset

It is 0 by default.

ModBus State Data Number

It is 2 by default.

ModBus Result Address Space

It is input_register by default.

ModBus Result Address Offset

It is 4 by default.

ModBus String Byte Swap

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

Communication Protocols	ModBus
∨ **ModBus**	
ModBus Enable	🔵
ModBus Mode	server
ModBus Control Address Space	holding_register
ModBus Control Address Offset	0
ModBus Control Data Number	2
ModBus State Address Space	holding_register
ModBus State Address Offset	2
ModBus State Data Number	2
ModBus Result Address Space	holding_register
ModBus Result Address Offset	4
ModBus String Byte Swap	

Communication Settings

■ Fins

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

Fins Communication Mode

It includes UDP or TCP.

Fins Local Port

It is 9600 by default.

Fins Dst IP

It sets the IP address of the target device.

Fins Dst Port

It sets the port of the target device.

Fins Data Format

It includes 16-bit or 32-bit.

Fins Scan Rate (ms)

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

Fins Control Area

It is saved in DM area by default.

Fins Control Addr

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

Fins State Area

It is saved in DM area by default.

Fins State Addr

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

Fins Result Area

It is saved in DM area by default.

Fins Result Addr

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

Communication Protocols	Fins
∨ **Fins**	
Fins Enable	▮
Fins Communication Mode	UDP
Fins Local Port	9600
Fins Dst IP	0.0.0.0
Fins Dst Port	9600
Fins Data Format	16 bit
Fins Scan Rate(ms)	30
Fins Control Area	DM Area
Fins Control Addr	0
Fins State Area	DM Area
Fins State Addr	2
Fins Result Area	DM Area
Fins Result Addr	4

Communication Settings

■ SLMP

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

SLMP Dst Addr

It sets the IP address of the target PLC.

SLMP Dst Port

It sets the port number of the target PLC.

SLMP Data Base Addr

It sets the first address of the data area.

SLMP State Base Addr

It sets the first address of the status area.

SLMP Network Num

It sets the network No.

SLMP PLC Num

It sets the PLC No.

SLMP Module I/O Num

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

SLMP Module Station Num

It displays the module station number.

SLMP Timeout

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

Communication Protocols	SLMP
∨ **SLMP**	
SLMP Enable	
SLMP Dst Addr	0.0.0.0
SLMP Dst Port	23
SLMP Data BaseAddr	0
SLMP State BaseAddr	0
SLMP Network Num	0
SLMP PLC Num	0xff
SLMP Module I/O Num	0x3ff
SLMP Module Station Num	0x0
SLMP Timeout	0x1

User Set Customization

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

Save Settings

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

Load Settings

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

ℹ️	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.
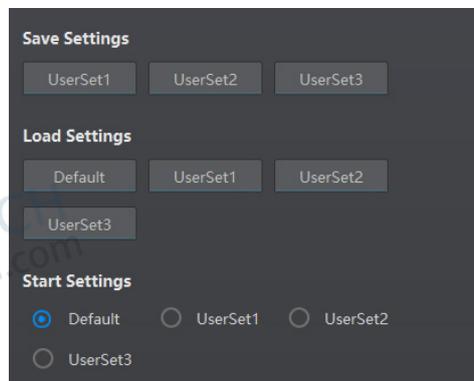
Statistics Information

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

| ℹ️ | You need to set device mode as Normal before using this function. |

Go to feature tree, find Statistics Info., and select Statistics Mode according to actual demands. Two statistics modes are available: All Frames means that the client software will display all data since the device is powered on. Latest Frames means that the client software will display data of the last 10 frames. Refer to the table below for specific parameters.

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.
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.

Event Report

The diagnose event report function in the feature tree monitors memory and CPU usage rate, and let you know when there is a crash, higher CPU usage rate, insufficient memory, and other events.
Go to feature tree, find Diagnose Event Report, and you can view related information as shown below. You can click Execute in Reset Event to clear all information.

5

CHAPTER 5 DEVICE OPERATION

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

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

Live View

You can view the real-time image in the live view window. Click ⬡ in live view window to start live view, or click ✕ to stop.
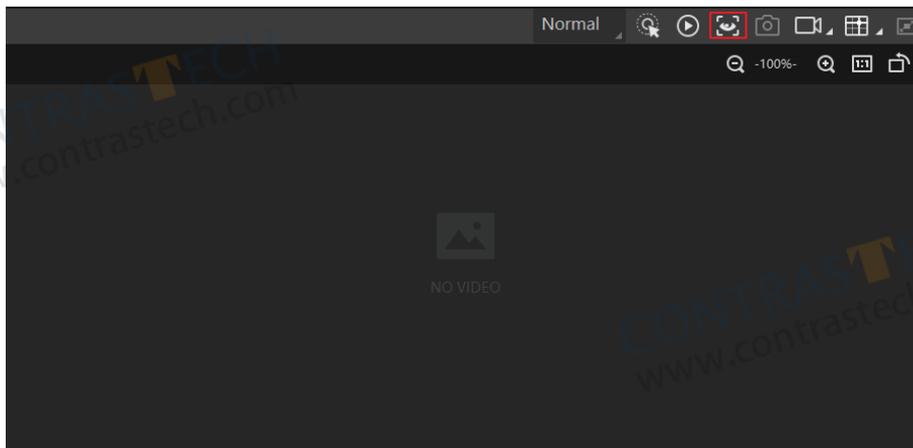
Enable Acquisition

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

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

ℹ	Acquisition is still going on if you only stop live view.
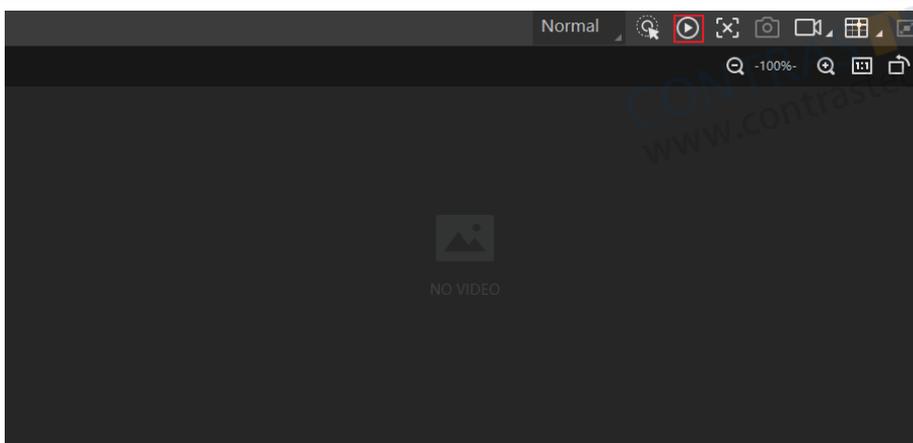
Add Cross Line

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

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

Width	5	%	Height	6	%
Offset X	0	px	Offset Y	0	px
Color			Thickness	1	px
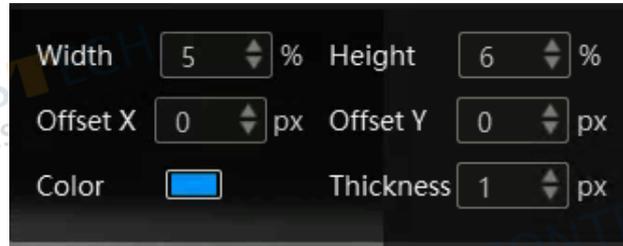
Start Recording

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

> ℹ Enabling acquisition is required before recording.

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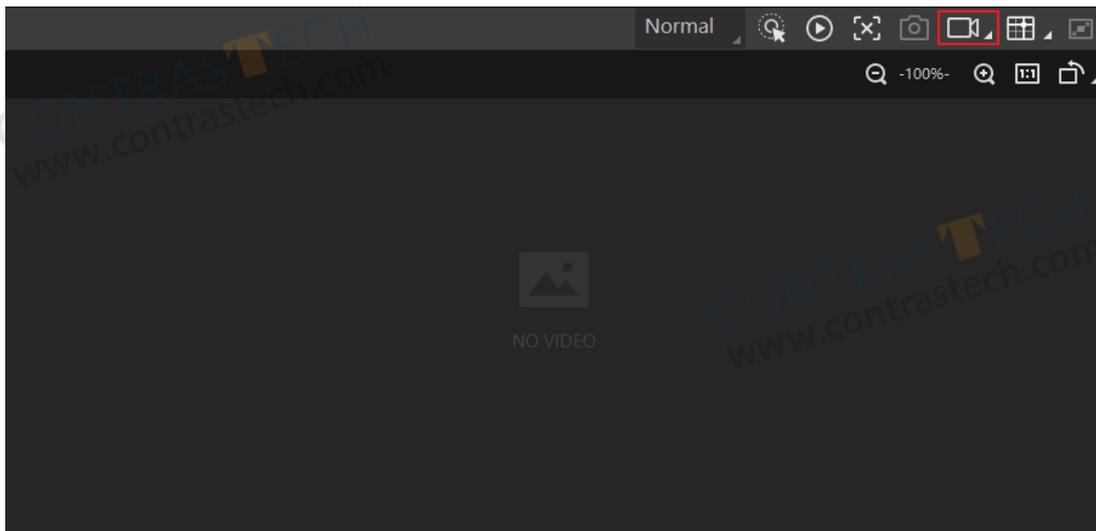
Split Window

The client software supports window division function that allows you to split the window into multiple-window mode to view the live view of multiple devices at the same time. Click ⊞ in control toolbar to select window division mode. You can click Custom to customize window division as you desired.
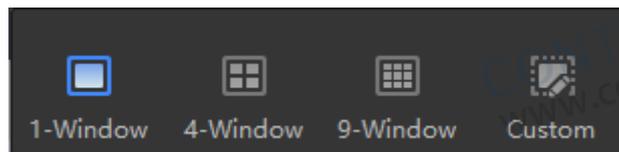
View Reports

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

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

View Log

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

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

Set Time

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

Steps

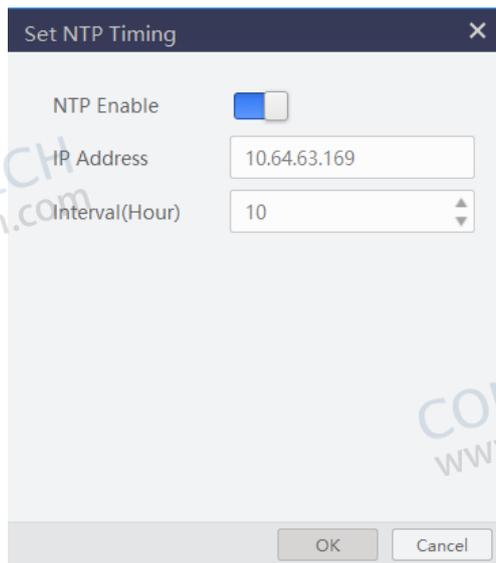1.Go to Config Management, and find Timing.

2.Click Setting and enable NTP Enable.

3.Set parameters according to actual demands.

| ℹ️ | Configure NTP server settings before using NTP time synchronization function. |

4. Click OK after settings.

Enable Device Auto Work

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

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

6

CHAPTER 6   I/O WIRING

Input Signal

The device's LineIn 0/1/2 are input signals, and their internal circuit is as follows.

	● The maximum input current of input signal is 25 mA. ● The breakdown voltage is 36 VDC. Keep voltage stable.
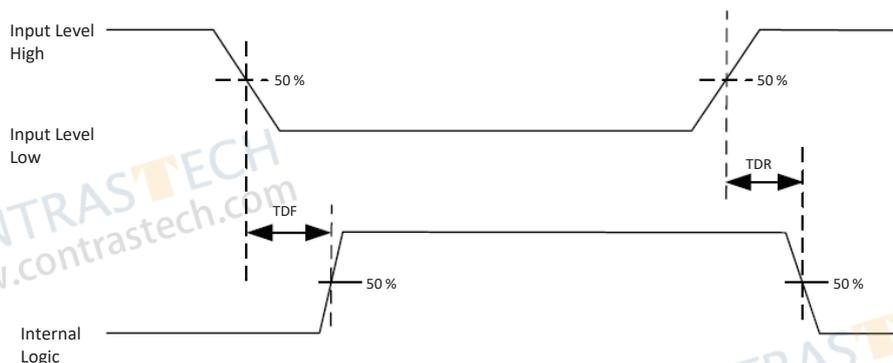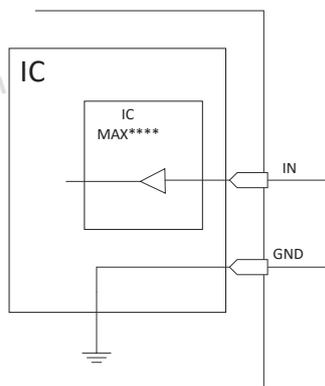
Input Electrical Feature:

Parameter Name	Parameter Symbol	Value
Input Logic Level Low	VL	0 ~ 9 VDC(VCC=24 V) 0 ~ 5.4 VDC(VCC=12 V)
Input Logic Level High	VH	11 ~ 24 VDC(VCC=24 V) 7.56 ~ 12 VDC(VCC=12 V)
Input Rising Delay	TDR	1.3 ~ 3.5 µs
Input Falling Delay	TDF	1.3 ~ 3.5 µs

	VCC stands for Volt Current Condenser, and it is the device's input voltage.

Output Signal

The device's LineOut 0/1/2 are output signals, and their internal circuit is as follows.

> ℹ The maximum output current of output signal is 200 mA.
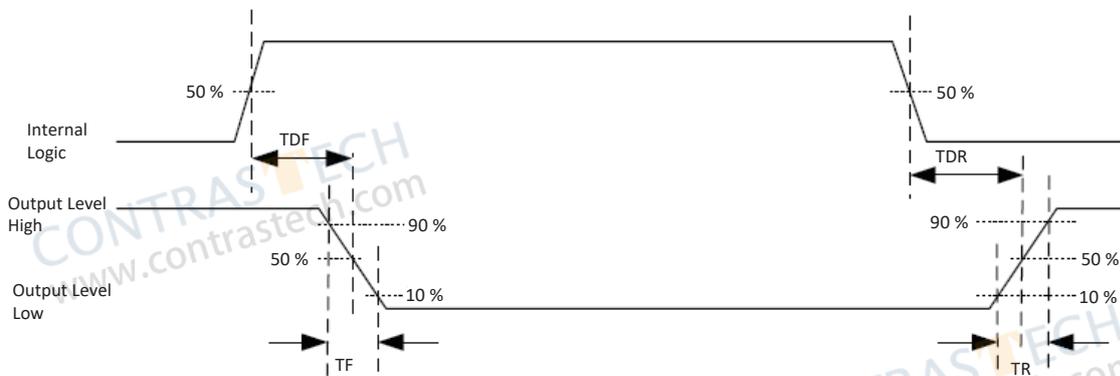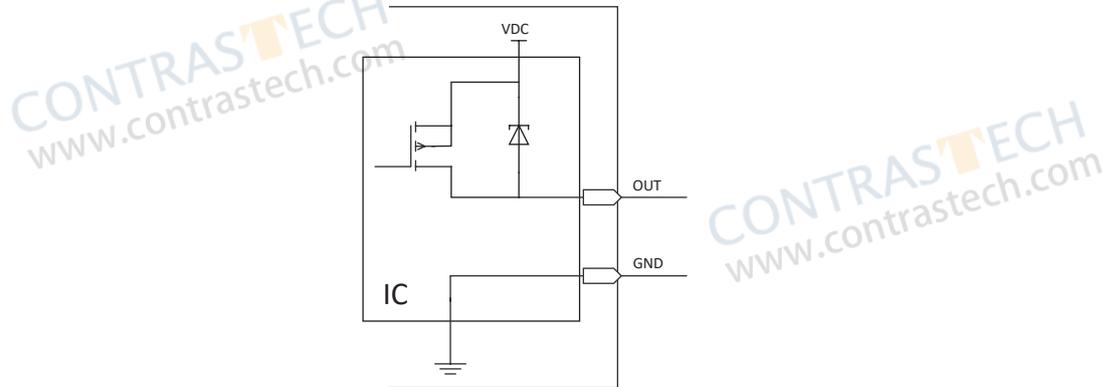
When the external voltage and resistance is 12 VDC and 1 KΩ respectively, output electrical feature is as follows.

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

Parameter Name	Parameter Symbol	Value
Output Logic Level Low	VL	212 mV
Output Logic Level High	VH	11.8 V
Output Rising Time	TR	0.4 μs
Output Falling Time	TF	0.4 μs
Output Rising Delay	TDR	0.4 μs
Output Falling Delay	TDF	0.4 μs

Input Signal Wiring

The device can receive the external input signal via I/O interface, and here we take LineIn 0 as an example to introduce input signal wiring.
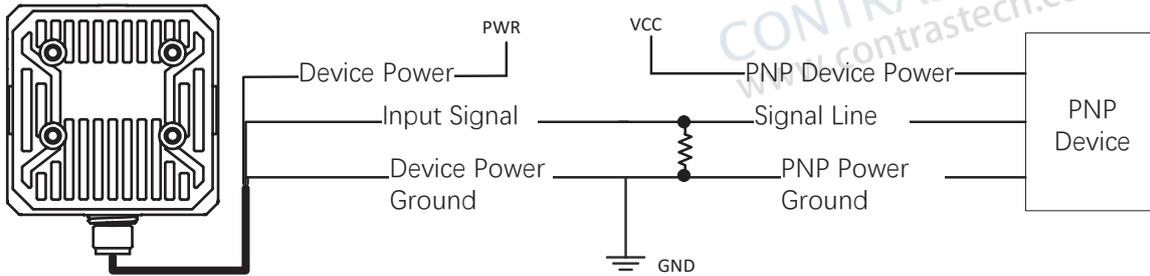
> ⓘ Input signal wiring may differ by external device types.

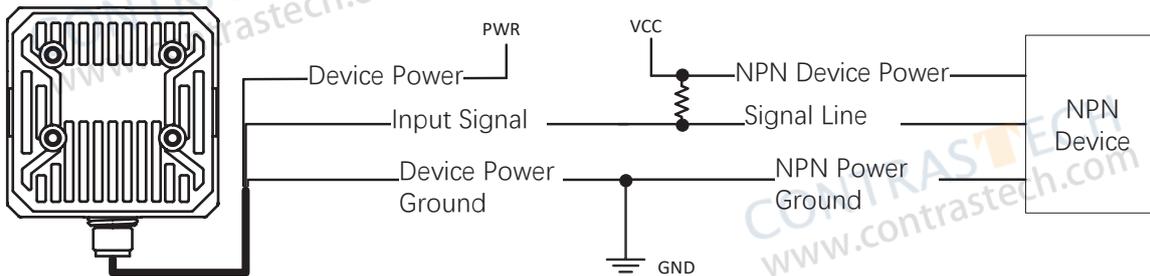## ■ PNP Device

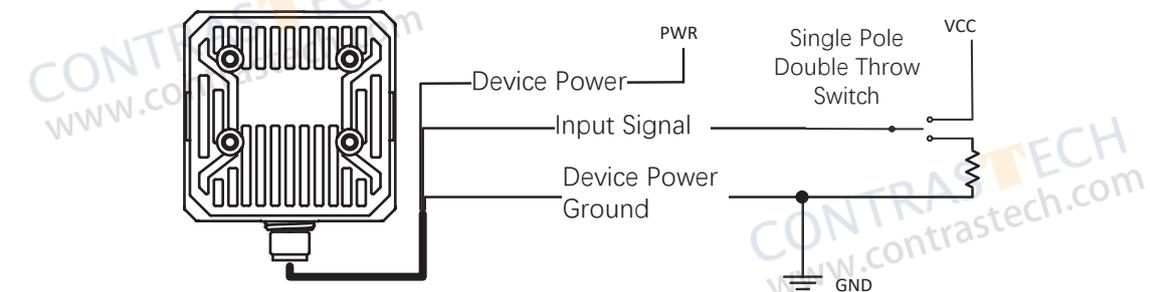> ⓘ It is recommended to use 330 Ω pull-down resistor.

PWR VCC
Device Power — PNP Device Power — PNP Device
Input Signal — Signal Line
Device Power Ground — PNP Power Ground
GND

■ NPN Device

> ⓘ If the VCC of NPN device is 12 VDC or 24 VDC, and it is recommended to use 1 KΩ pull-up resistor.

PWR VCC
Device Power — NPN Device Power — NPN Device
Input Signal — Signal Line
Device Power Ground — NPN Power Ground
GND

■ Switch

> ⓘ It is recommended to use 330 Ω pull-down resistor.

PWR Single Pole Double Throw Switch VCC
Device Power
Input Signal
Device Power Ground
GND

Output Signal Wiring

The device can output signal to external devices via I/O interface, and here we take LineOut 0 as an example to introduce output signal wiring.
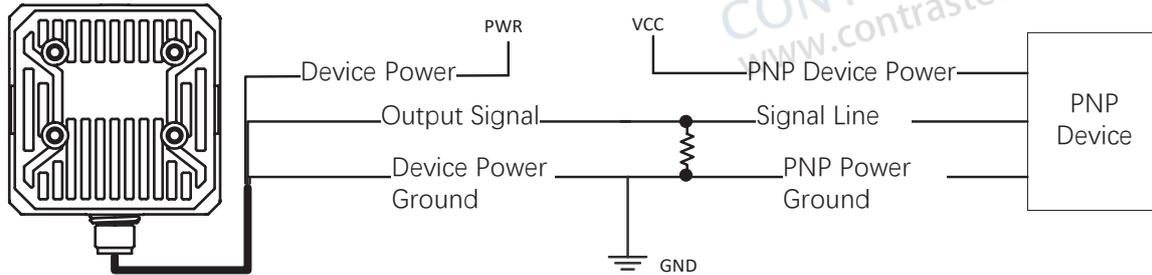
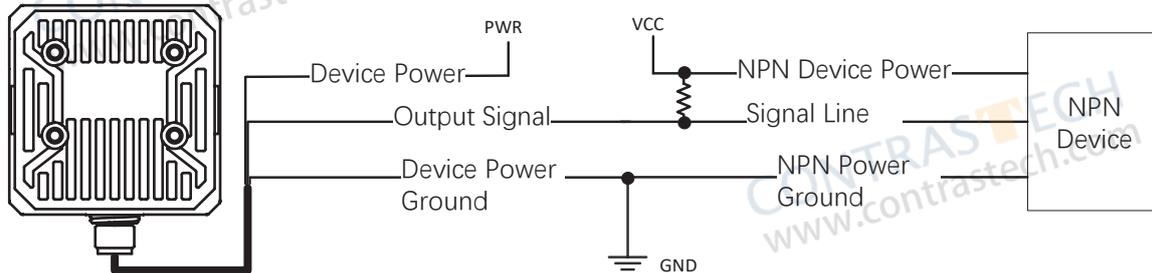| i | ● Output signal wiring may differ by external device types.
● The voltage of VCC should not higher than that of PWR. Otherwise, the device's output signal may have exception. |

■ PNP Device

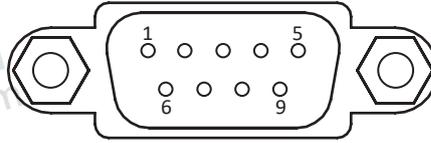| i | It is recommended to use 330 Ω pull-down resistor. |

■ NPN Device

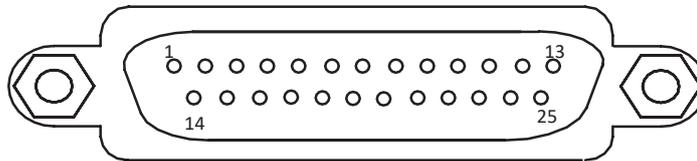| i | If the VCC of NPN device is 12 VDC or 24 VDC, and it is recommended to use 1 KΩ pull-up resistor. |

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.
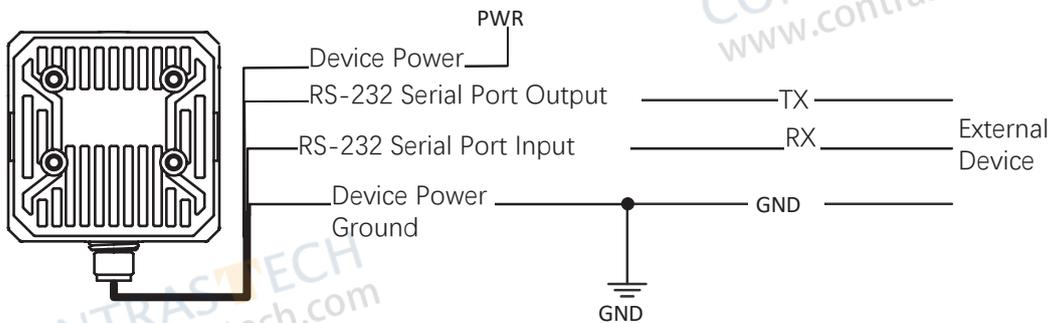
Pin No.	Name	Function
2	RX	Receive data
3	TX	Send data
5	GND	Signal ground

Pin No.	Name	Function
2	TX	Send data
3	RX	Receive data
7	GND	Signal ground

■ RS-232 Serial Port Wiring

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

DM-J Code Reader User Manual

7

CHAPTER 7 **OTHER FUNCTIONS**

Trouble Shooting

PROBLEM	Reason	Solution
Run client, there is no listed device.	The device is powered off.	Check the device power connection (observe whether the top PWR light is solid green or not), to make sure the device is powered up normally.
	Network exception.	Check the network connection (observe whether the top LNK light is flashing green or not), to make sure the device can be connected to the network normally. PC port and the device are in the same network segment.
All black or too dark during preview.	Insufficient brightness of supplement light.	Increase the brightness of supplement light appropriately, or change to a brighter one. Increase exposure and gain appropriately.
	Too small adjustment value of exposure and gain.	Increase exposure and gain appropriately.
	The polarization lens cap may be used.	The brightness of polarization lens cap is low, and it is not recommended to use it in normal condition.
Image incoherent/Low frame rate/ Image tearing when adjusting the view preview.	Network circuitry speed is not 100 Mbps.	Check whether network transit speed is 100 Mbps or not.
No image in the live view.	Enabled trigger mode, but there is no trigger signal.	Sent the trigger signal to the device/Disable the trigger mode.
	Network circuitry speed is not 100 Mbps.	Check whether network circuitry speed is 100 Mbps or not.

技术支持

8

CHAPTER 8 **TECHNICAL SUPPORT**

If you need advice about your camera or if you need assistance troubleshooting a problem with your camera, it's highly recommended to describe your issue in details and contact us via E-mail at support@contrastech.com

It would be helpful if you can fill-in the following table and send to us before you contact our technical support team.

Model:		SN:	
Describe the issue in as much detail as possible:			
If known, what's the cause of the issue?			
How often did/does the issue occur?			
How severe is the issue?			
Parameter set			

Hangzhou Contrastech Co., Ltd

No.8 Xiyuan 9th Road, West Lake District Hangzhou Zhejiang 310030 China
Tel: 86-571-89712238
www.contrastech.com