CONTRASTECH

Industrial Code Reader User Manual DM-JxxU

V2.5.7, Jul. 2025

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.

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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.

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.
- Supports one-key auto adjustment and easy to operate.
- Supports 180° rotation structure, status indicator and focus adjustment methods.
- Modular light source design, which is easy to switch
- Adopts IO interfaces for input and output signals.
- 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

Device Status		Indicator	Code Reading Result Indicator
Normal Status	Not Streaming	Solid Blue	Unlit
	Streaming	Unlit	
Exception Status	Power Off	Unlit	
	Network Exception	Solid Yellow	
Code Reading Status	Successful Code Reading	Flashing Green	Flashing Green
	Failed Code Reading	Flashing Red	Flashing Red
Parameter Adjustment Status	Successful Parameter Adjustment	Flashing Green	Unlit
	Failed Parameter Adjustment	Flashing Red	
	Parameter Adjustment Ended (Not Streaming)	Solid Blue	
	Parameter Adjustment Ended (Streaming)	Unlit	

Mechanical Dimensions

The dimensions is in millimeters:

The code reader are interfaced to an external circuity via 12-pin connectors located on the housing and contain power, I/O, and serial signals. The interface is threaded. Tightening the interface during use can reduce the loosening of the interface caused by on-site vibration. There is an indicator light on the top of the device that show the device status. An 8-pin M12 connector can be converted to RJ45 network cable for data transmission.

There are M3 screw holes on the back of the device for fixing the device.

Camera Housing and Base Mounting Hole Size(mm):

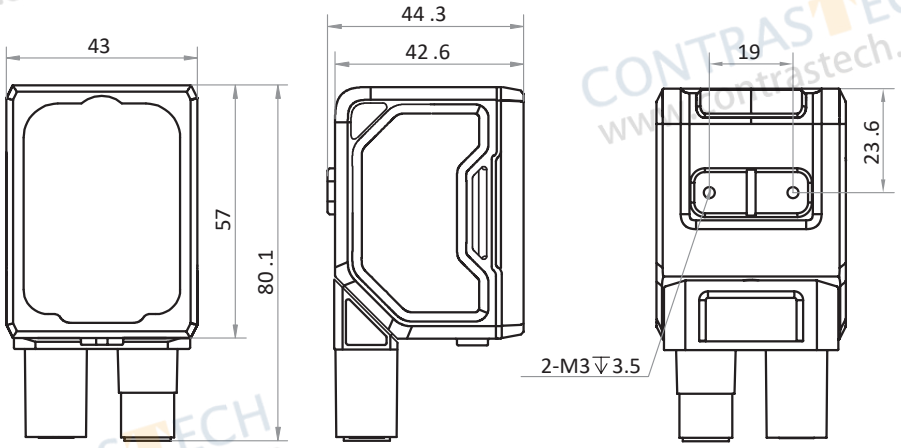


Fig. 1-1: 43 × 44.3 × 80.1 mm Mechanical Dimensions (in mm) of the code reader with M12-Monut housing (The installation uses M3 screws).

■ Lens Cap

The device adopts transparent + polarized + diffused lens cap, which helps the improvement of code recognition rate.

i	It can be replaced with other lens cap according to actual demands.

■ Light Source

It is the red LED light source by default used to provide light when the device acquires images.

The white/blue/IR light source is optional.

■ Button

It is used to trigger the device or to realize a smart tune.

* Trigger Button

_ If the device is in continuous acquisition mode, press the button and the device enters trigger mode.

_ If the device is in trigger mode, press the button and the device triggers once.

* Smart Tune Button

Hold the button for 2 sec and the device starts smart tune. Hold the button for 2 sec again during smart tune process, and the adjustment will be cancelled.

i	The smart tune function is not available when the client software is connecting the device.

■ TOF

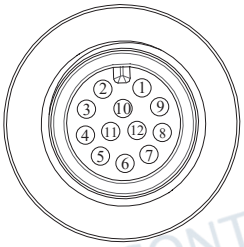
It is used to detect the position of targets, and realize focus and image parameter adjustment.

TOF function is applicable to the device with liquid lens only.

CHAPTER 2 POWER AND I/O IENTERFACE DEFINITION

I/O Connection Definition and Assignments

It provides power, input/output, 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.



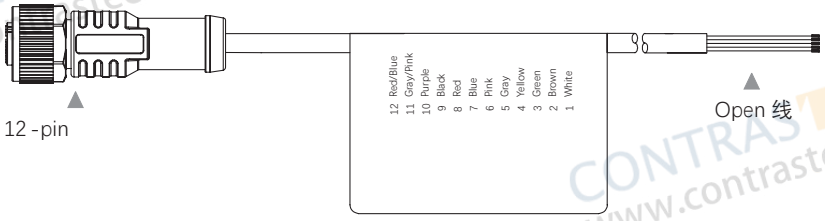
12-pin M12 Connector:

Color	Pin	Signal	Signal Source	Designation
White	1	DC-PWR	-	Direct current power supply positive
Brown	2	GND	-	Power supply ground
Green	3	OPTO_OUT0	Line 3 output signal line	I/O isolated output 3
Yellow	4	OPTO_OUT1	Line 4 output signal line	I/O isolated output 4
Gray	5	OPTO_OUT2	Line 5 output signal line	I/O isolated output 5
Pink	6	OUT_COM	Line 3/4/5 output signal ground	Output common port
Blue	7	OPTO_IN0	Line 0 output signal line	I/O isolated input 0
Red	8	OPTO_IN1	Line 1 output signal line	I/O isolated input 1
Black	9	OPTO_IN2	Line 2 output signal line	I/O isolated input 2
Purple	10	IN_COM	Line 0/1/2 output signal ground	Input common port
Gray Pink	11	RS-232_R	-	RS232 input
Red Blue	12	RS-232_T	-	RS232 output

- 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.

12-pin M12 Cable diagram

Order Model: VT-M12TR12P-3M(SM)



* You should refer to the table above and the label attached to the supplied power and I/O cable to wire the device.

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.

IO Box

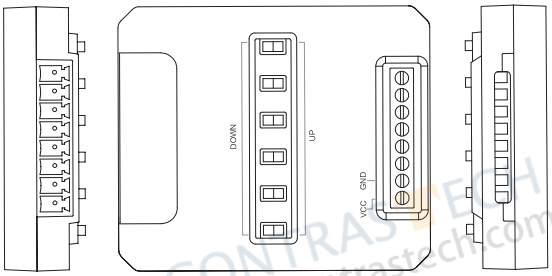
When using three channels of IO simultaneously, an IO box can be optionally configured. The IO box can connect the power supply and IO interface of the device with external equipment. The device supports the following two types of IO boxes.

i	Different IO boxes have differences and need to be purchased separately. Please refer to the actual one.

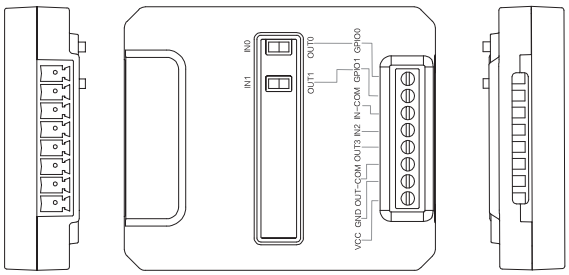
Type	Usage
V1.0	The IO box can be used for switching pull-up and pull-down resistors for each IO channel.
V2.0	The IO box can be used for upgrading the non opto-isolated IO to opto-isolated IO.

i	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.



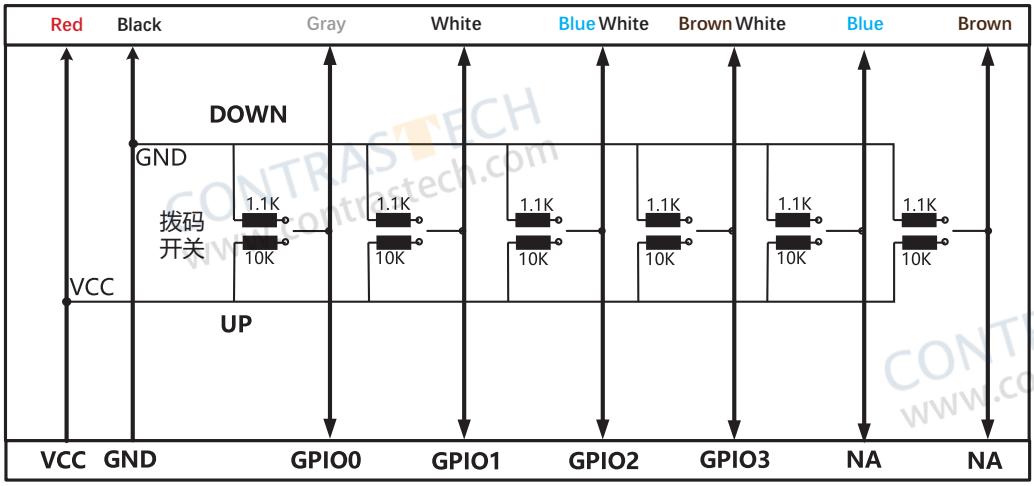
V1.0



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.

i	● 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.

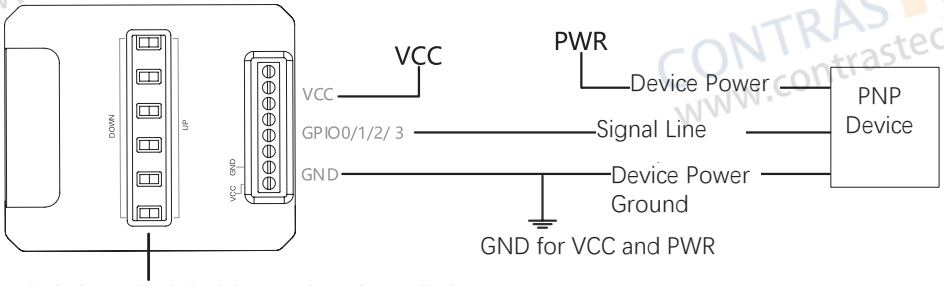
IO Box

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.

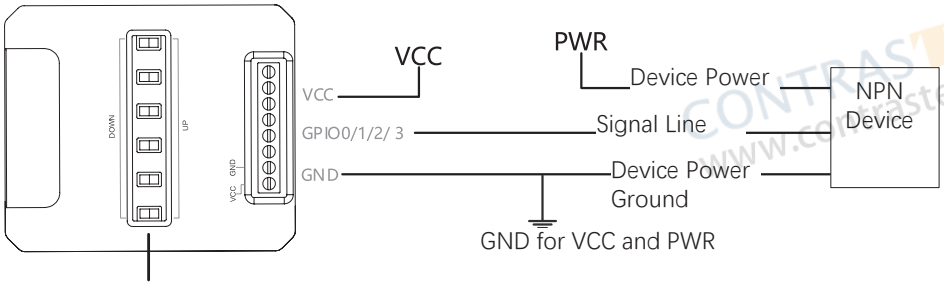
Connecting to PNP Device



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

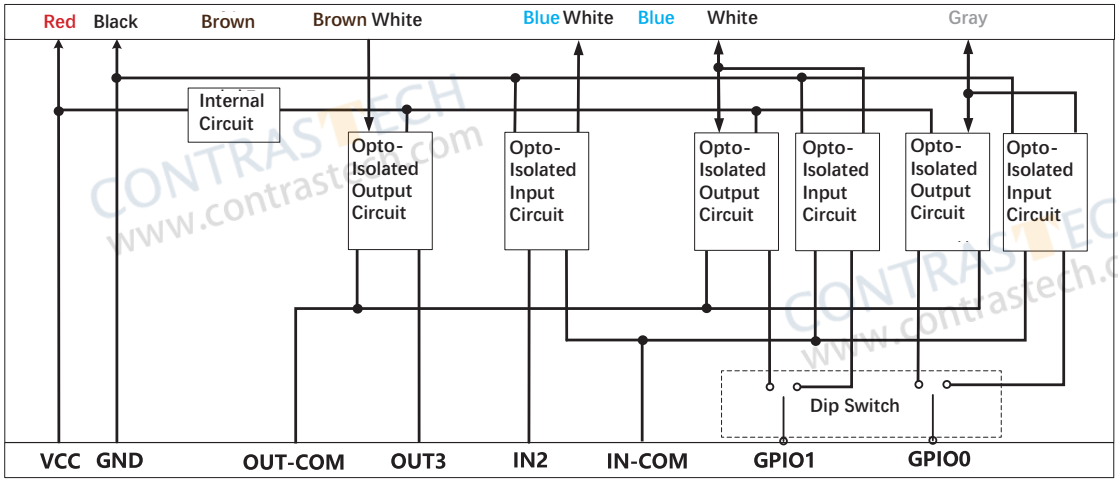


Switch to the right side to select the pull-up resistor

- 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

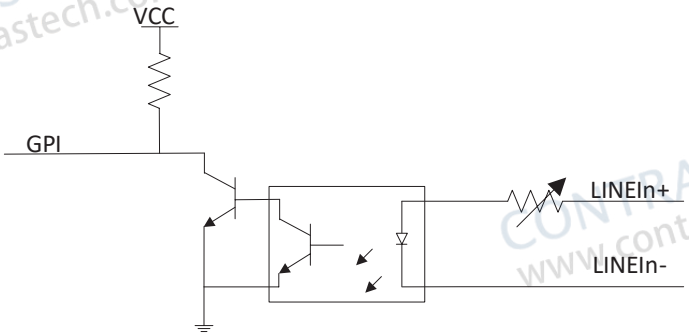
V2.0 Internal Circuit



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.

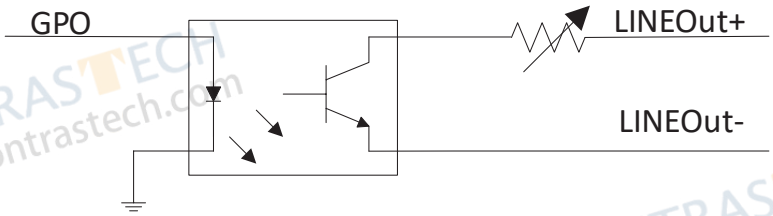
The electrical feature of the opto-isolated input signal is shown in the table below.

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.



- 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.

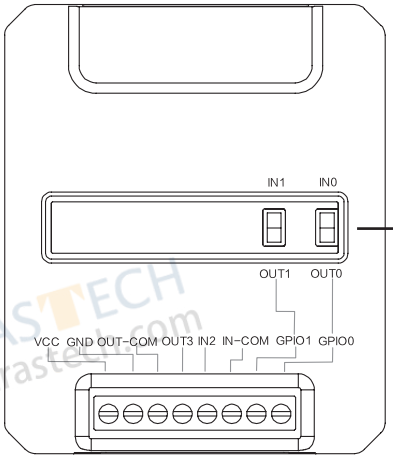
The electrical feature of the opto-isolated output signal is shown in the table below.

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.

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

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

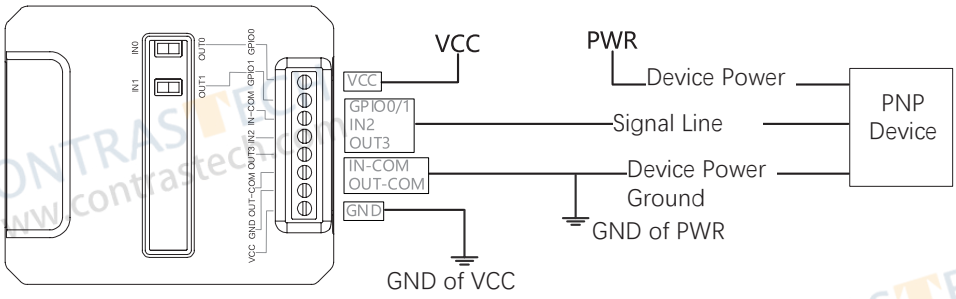
When connecting an external device to trigger input/output via an IO box, there are several wiring methods for different scenarios. You can select an appropriate wiring method according to the actual needs.

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

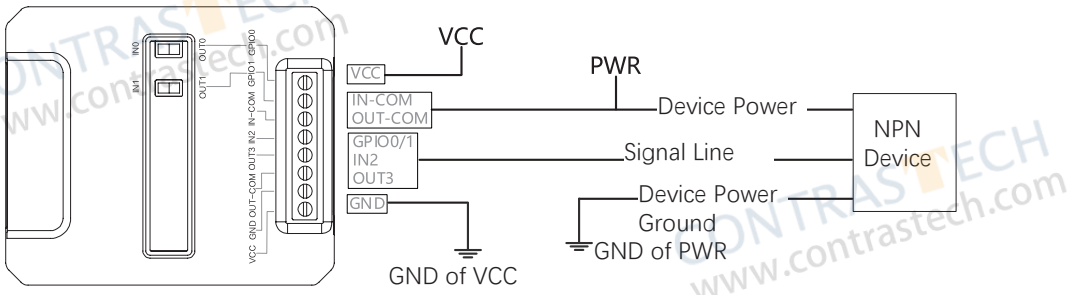
When wiring, the trigger parameters need to be set in reverse.That is, if an external device is required to send a low-level signal to the IO box for triggering the device, the parameter Trigger Type should be set to Level High.



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.

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.



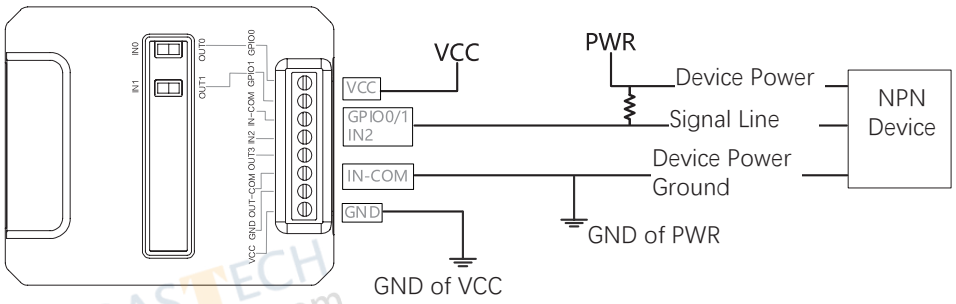
IO Box

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.



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 M3 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.

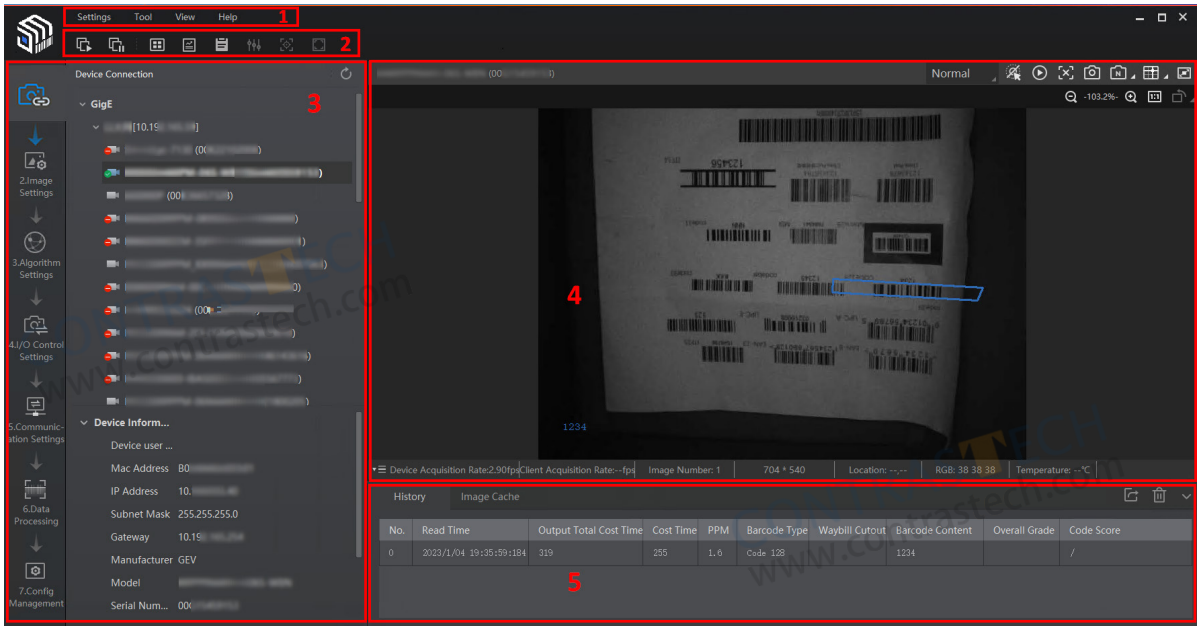
3. Use the network cable to connect the device to the switch or network card normally for image debugging or data communication.

Software Operation

DM-Datum Operation

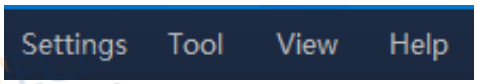
1. Double-click the DM-Datum shortcut on the desktop to open up the client software, the client software can read the device information and display it.

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

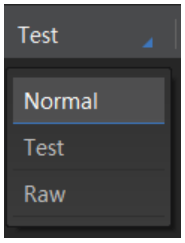
This area displays the acquisition images and algorithm reading result in real-time. You can click different icons to capture and save image, record, etc.

History Record

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.

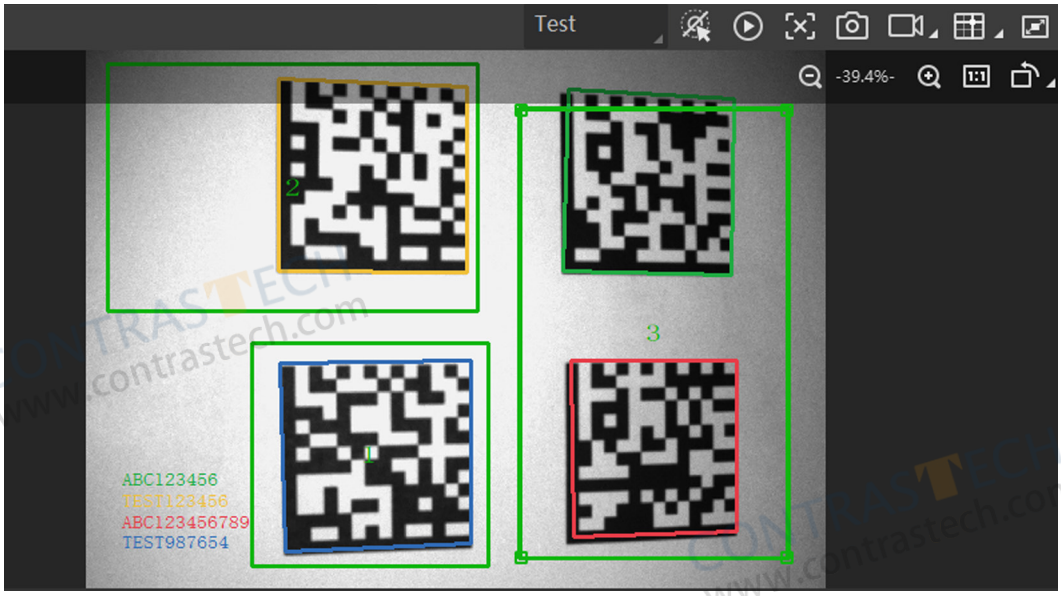
Software Operation

2. 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.



3.Through the algorithm configuration module in the manu bar, add the read code system according to actual needs. For specific introduction, please refer to the chapter on Add Code.

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



5. Click in the control toolbar to perform smart tune and adjust parameters like exposure, gain, etc. if the code reading effect is not very good.

_ Click if you just want to adjust focus parameters.

_ Click if you just want to perform self-adaptive adjustment.

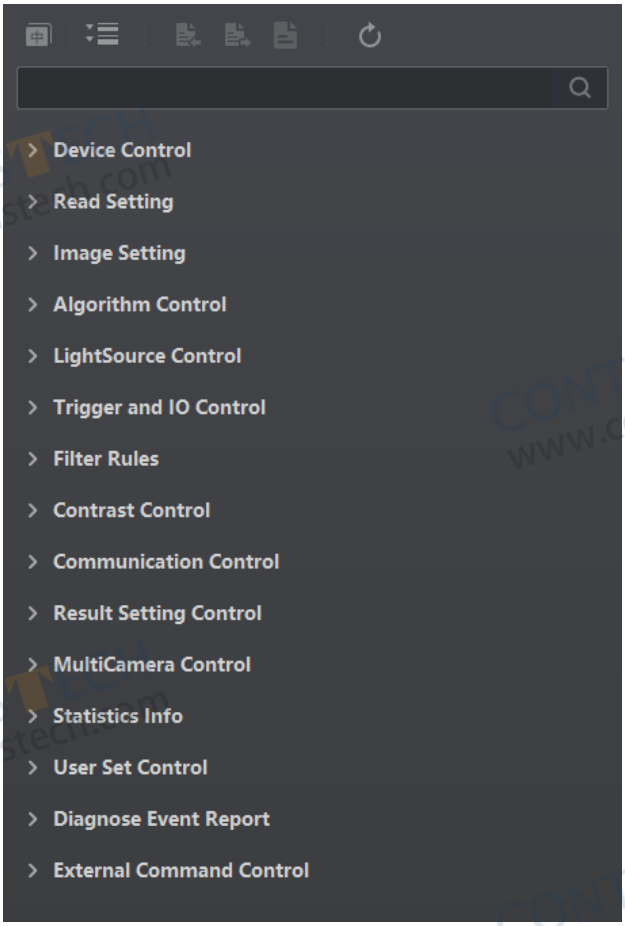
6. Go to Algorithm Settings in configuration wizard panel to add code types accordingly.
7. Go to I/O Control Settings to set input and output parameters.
8. Go to Communication Settings to select communication protocols and set parameters.
9. (Optional) Go to Device Connection to set other parameters of the device accordingly.
10. Go to Configuration Management to save and load user sets, or use default settings.
11. (Optional) Go to history panel to view codes recognized by the device.

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.

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



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.
SmartTune	It allows you to One - key operation for automatic focusing and adaptive adjustment of the device.
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.
MultiCamera Control	It allows you to set parameters of multi-camera to let them operate in a collaborative way.
Statistics Info	It allows you to count data related with code reading.
User Set Control	It allows you to save and load configured user set.
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.
External Command Control	It allows you to set communication parameters between the device and external devices.

Image Quality Settings

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

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

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.

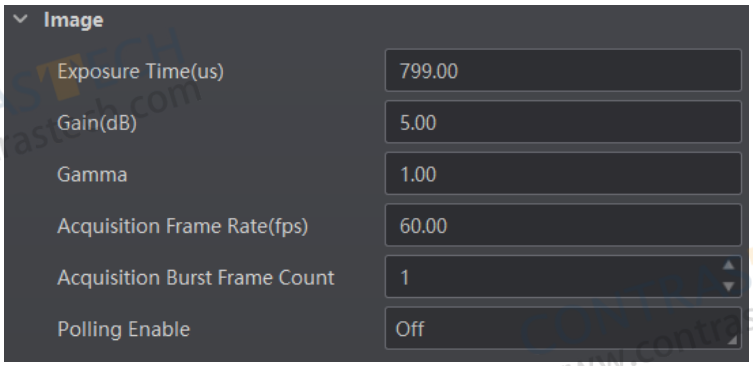


Image Quality Settings

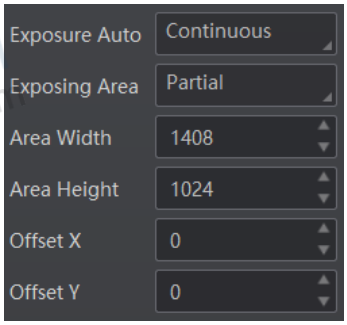
Exposure

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.

Steps

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.



Gain

The device supports three types of gain modes, including off, once, and continuous. 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.

Steps

1.Right click the device in Device Connection, and click Feature Tree.
2.Go to Image Setting, and select Once or Continuous as Gain Auto.

Image Quality Settings

Polling

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

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

Single Mode

Before You Start:

- Make sure the trigger mode is opened and the trigger source is not the brightness before setting the polling function.

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

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

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

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

4. 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 Focus Position	It sets the 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.

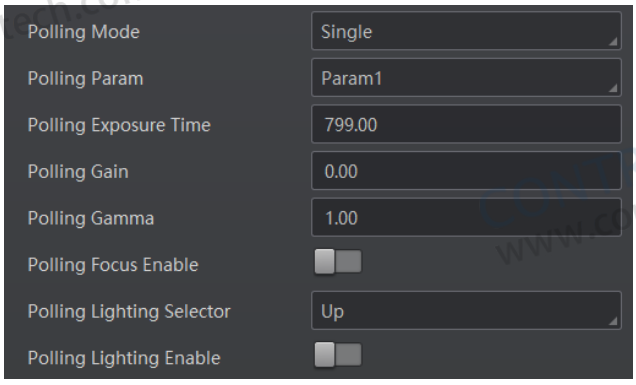


Image Quality Settings

Multiple Mode

	● In multiple mode, the device supports trigger parameters like software trigger, external trigger, etc., does not support stopping polling via the external trigger. ● The rule for multiple-mode polling is that the polling is started from the polling parameter with Best Polling Group Idx, and then execute other polling parameters you selected in turn. For example, if the Param3 is the Best Polling Group Idx and Param1, Param2, Param4 and Param5 are enabled, the polling order is Param3 > Param1 > Param2 > Param4 > Param5.

Before You Start:

● Make sure the trigger mode is opened and the trigger source is not the brightness before setting the polling function.

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

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

3.Set Polling Time and Polling Period according to actual demands.

● Polling Time is used to determine whether the polling is finished or not, and it ranges from 100 to 2147482.

● Polling Period is whole period from Param1 to Param8, and it ranges from 1 to 5000.

4.Select 2 to 8 sets of parameters (e.g. Param1 and Param2) from Polling Param, and enable Polling Param Enable to let them take effect.

5.Set parameters 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 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.

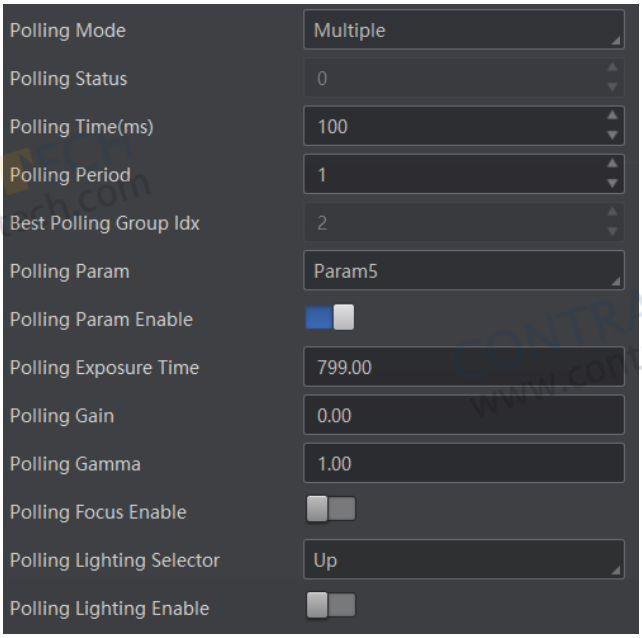
6.Repeat step 4 and step 5 to set other parameters from Polling Param.

7.(Optional) View Polling Status and Best Polling Group Idx.

● Polling Status: It displays the current polling status. 0 stands for polling ended, and 1 stands for polling started.

● Best Polling Group Idx: It is used to display the polling parameter number when the device recognizes codes after enabling polling. If the polling is disabled or polling parameters are edited, it displays 1 by default.

Image Quality Settings



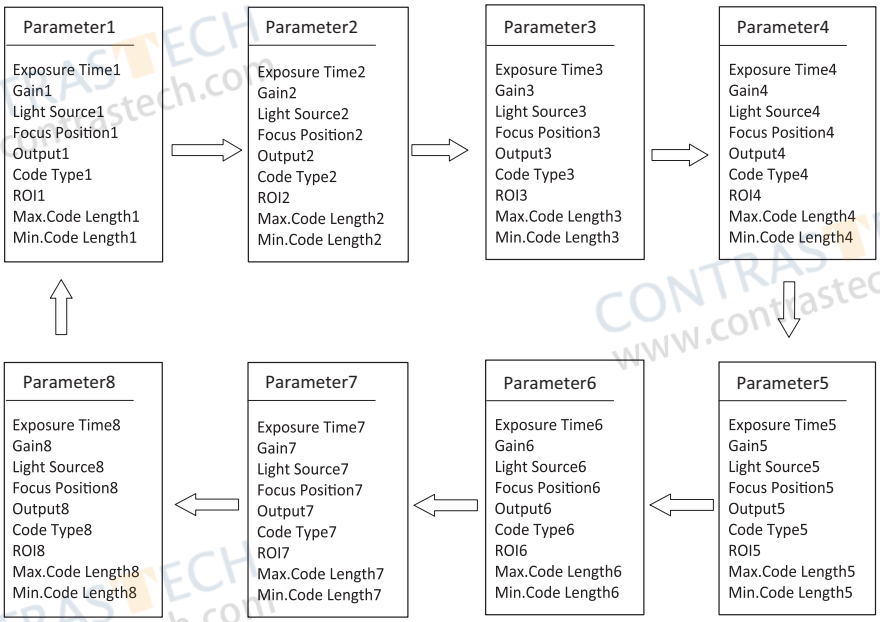


Image Quality Settings

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.

Steps:

1. Go to Image Settings → Light, and select Aiming Light Enable.
- Off means that the aiming light is turned off.
- Strobe means that the aiming light is turned on if the device is acquiring images and the aiming light is turned off if the device is not acquiring images.
- Strobe Long means that the aiming light is used when the device is powered on.

2. Click lamps on the light source illustration to turn on or turn off lamps on different directions.

i	The lowest LED lamp cannot be turned on if the upper and middle LED lamps are on.

3. Select Lighting Mode according to actual demands.
- Strobe means the light flashes at a specific interval.
- Long means the light is solid.

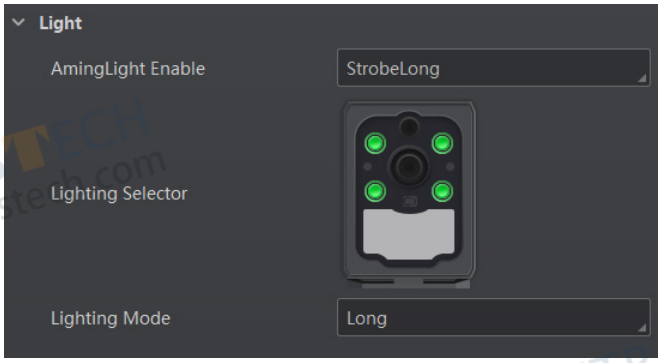


Image Quality Settings

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.

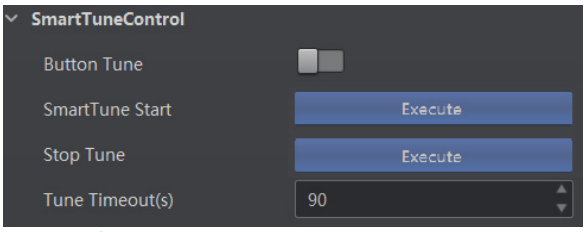
Smart Tune by Pressing Tune Button

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

Steps:

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

2. Enable Button Tune, and disconnect the device from the client software.



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 2 sec and the device starts smart tune.

4.(Optional) Hold the button for 2 sec again during smart tune process, and the smart tune will be cancelled.

Smart Tune via Client Software

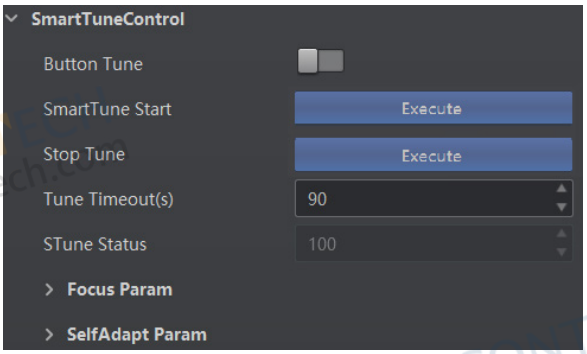
Apart from pressing tune button to realize smart tune, you can also configure parameters via the client software to realize it.

Before You Start:

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

i	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 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 Whole Area Focus as Focus Mode Selector.

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

3. Select 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.

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.

i	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

Fast Focus

The device with liquid lens and ToF function is able to achieve fast focus and is suitable for the scene with the focus speed requirement. In the mobile scene, the device can adjust focus in real time according to the depth of field of the object.

i	Only device with liquid lens and ToF function supports fast focus settings.

Steps:

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

2.Go to Focus Param, and enable Fast Focus Enable.

3.Set ToF Tolerance to ToF fast focus distance threshold.

i	The device starts adjusting focus when ToF changing range exceeds configured ToF Tolerance.

4. View current ToF distance via ToF Distance.

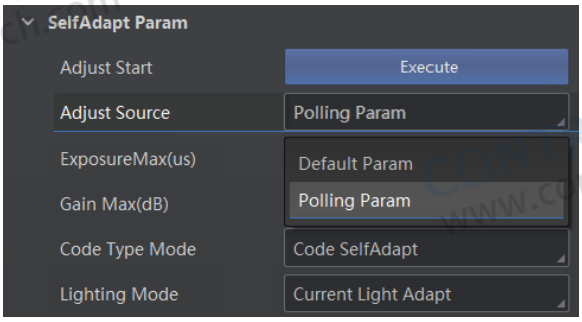
Image Quality Settings

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：

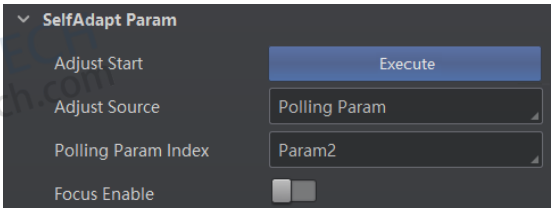
1. Go to Image Settings → Smart Tune Control → Self Adapt Adjust, and unfold Self Adapt Adjust.



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. 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.

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 light source parameters in Lighting Mode.

_ Light Adapt: The client software will select the best one from all lighting options during the self-adaptive adjustment.

_ Current Light Adapt: The client software will use the current configured light source.

_ All Light Disable: All light sources will be turned off during self-adaptive adjustment process.

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

i	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.

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.

i	● 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.
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.

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

Code Algorithm Settings

Code Reading ROI

Algorithm ROI (Region of Interest) allows the device to execute algorithms and read codes on the specific area you selected, and thus improving code reading efficiency.
Currently, multiple ROIs can be configured, and the device outputs codes according to the number of ROI (e.g. Region 1, Region 2, and Region 3···) in turn. The client software supports drawing single group of ROI and drawing ROI via chessboard.

- If no code is recognized in the algorithm ROI, and the device will output "noread".
- Before drawing ROIs, make sure that there are images in the live view window after stopping preview.
- If no algorithm ROI is enabled, and the full screen is the algorithm ROI by default.
- This function may differ by device models.

Draw Single Group of ROI

Steps:

1.Go to Algorithm Settings, and find Algorithm ROI.

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

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

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

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

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

_ Algo Region Left X: It refers to the X coordinate of the upper left corner in algorithm ROI.

_ Algo Region Left Y: It refers to the Y coordinate of the upper left corner in algorithm ROI.

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

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

5.(Optional) Click Execute in Restore Max. Algorithm ROI to restore the ROI to the full screen.

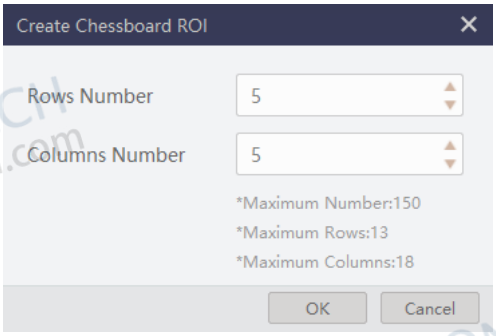
6.(Optional) Click Execute in Clear All ROI to delete all ROIs.

Draw ROI via Chessboard

Steps:

1.Go to Algorithm Settings, and find Algorithm ROI.

2.Click Execute in Chessboard ROI, set parameters, and click OK after setting.



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

4. (Optional) Click to restore the ROI to the full screen, and click × to clean all ROIs.

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

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

Code Algorithm Settings

Algorithm Parameter

In Algorithm Parameter, select 1DCode, 2DCode or Stacked Code as Arithmetic Type, and then you can set its corresponding parameters.

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

Set 1D Code

● 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. Adaptive means that the client software can recognize both the black code with white background, and the white code with black background.

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

i	You need to select Code 39 in Add Barcode.

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

i	You need to select ITF 25 in Add Barcode.

● 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.

Set 2D Code

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

● DM Code Type: It includes All, ECC140, and ECC200.

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

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

Set Stacked Code

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

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.

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

1D Code Quality Evaluation

The 1D quality evaluation function uses the ISO15416 standard to judges the quality of codes and outputs overall grade. Currently, this function is only applicable to Code 39 and Code 128.

Steps:

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

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.
Symbol 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.
Quiet Zone	It evaluates the quite zone width of the code meets the specification.

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 gradeC. 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.

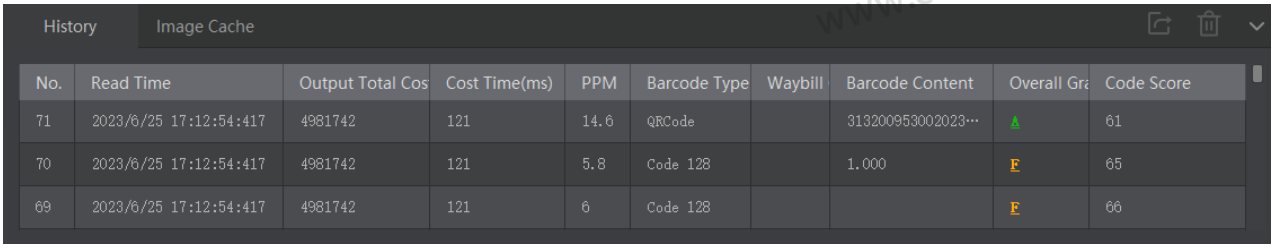
5.Enable Aperture Enable and enter Aperture according to the smallest size of codes.

6.(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.

7.(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.

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



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.

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

- Iso15415 is applicable to the quality evaluation for label 2-dimensional codes.
- Iso29158 is applicable to the quality evaluation for DPM format 2-dimensional codes.

4. Refer to step 5 to step 7 in Set 1D Code Quality Evaluation to set other parameters.

Code Algorithm Settings

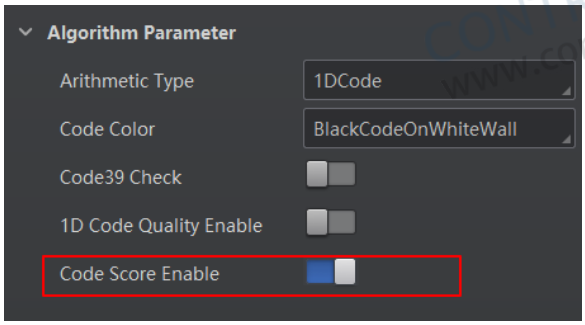
Code Score

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

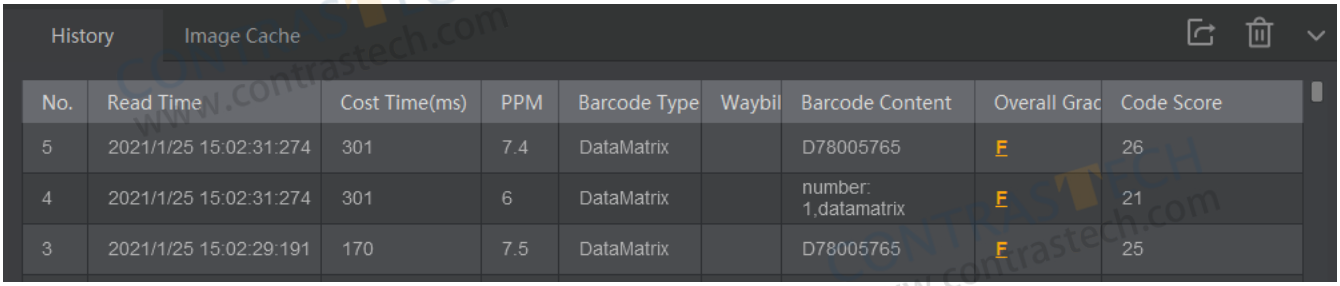
- The function of code score may differ by device models.
- In test mode, this function is enabled by default. In normal mode, you need to enable it manually.
- The code score is determined by two factors including image quality and print quality of codes. The range of code score is between 0 and 100, and the higher the score, and easier the code can be read.

Steps:

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



2. 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 Grac	Code Score
5	2021/1/25 15:02:31:274	301	7.4	DataMatrix		D78005765	F	26
4	2021/1/25 15:02:31:274	301	6	DataMatrix		number: 1,datamatrix	F	21
3	2021/1/25 15:02:29:191	170	7.5	DataMatrix		D78005765	F	25

3. (Optional) 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.

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.

Set Trigger Mode

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

- **Internal Trigger Mode**

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

- **External Trigger Mode**

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

Enable Internal Trigger Mode

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

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

Enable External Trigger Mode

In the external trigger mode, the device acquires images via external signals like software signal and hardware signal. You have 2 methods to enable the external trigger mode:

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

Set and Execute Software Trigger Mode

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

Steps

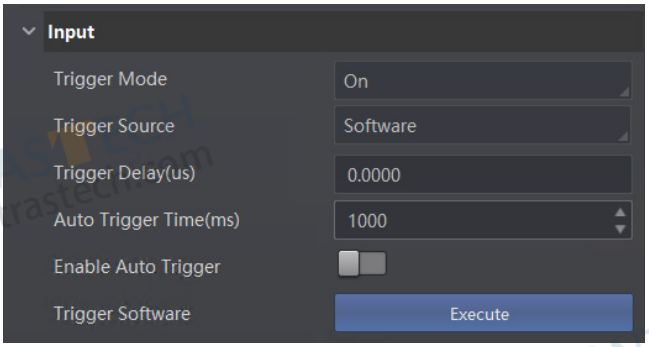
1.Go to I/O Control Settings → Input → Trigger Mode.

2.Select On as Trigger Mode.

3.Select Software as Trigger Source.

4.Click Execute in Trigger Source to send trigger commands.

5.(Optional) Enter Auto Trigger Time, and enable Enable Auto Trigger to let the client software automatically send trigger signal to device according to the interval you set.



Signal Input Settings

Set and Execute Hardware Trigger Mode

Steps

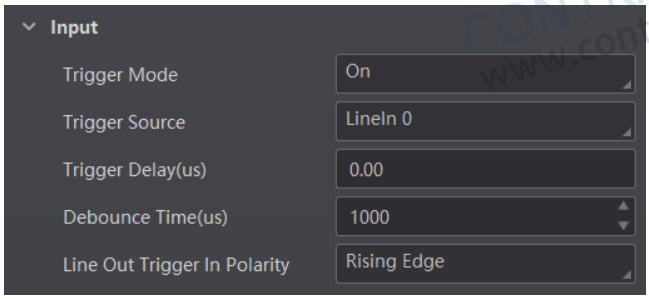
1.Go to I/O Control Settings → Input → Trigger Mode.

2.Select On as Trigger Mode.

3.Select the specific line as Trigger Source according to actual demands.

4.Set Debounce Time and Trigger Activation according to actual demands.

i	● When selecting Rising Edge or Falling Edge as Line Out Trigger In Polarity, you can set Trigger Delay. ● When selecting Level High or Level Low as Line Out Trigger In Polarity, you can set Start Delay Time and End Delay Time according to actual demands.



Set and Execute Counter Trigger Mode

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

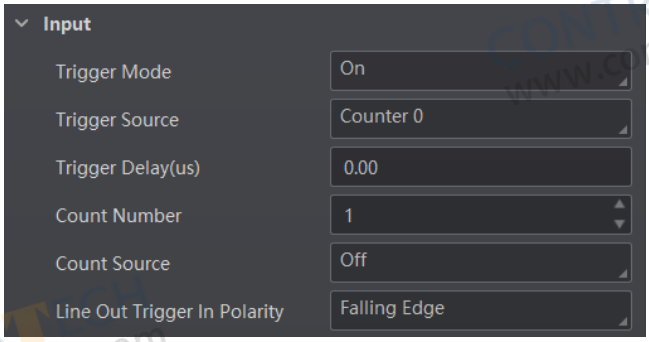
Steps

1.Go to I/O Control Settings → Input → Trigger Mode.

2.Select On as Trigger Mode.

3.Select Counter 0 as Trigger Source.

4.Set Trigger Delay, Count Number, Count Source, and Trigger Activation



Set and Execute TCP Trigger Mode

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

Steps

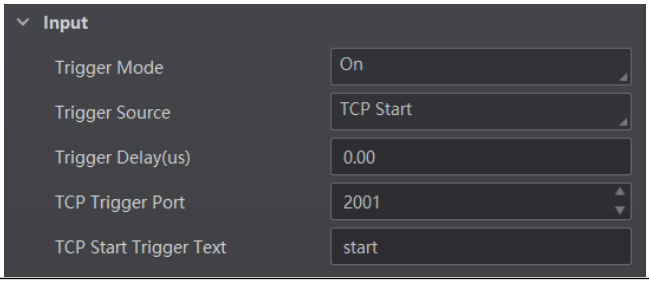
1.Go to I/O Control Settings → Input → Trigger Mode.

2.Select On as Trigger Mode.

3.Select TCP Start as Trigger Source.

4.Set following parameters according to actual demands.

- TCP Trigger Port: It sets the host port of TCP trigger.
- TCP Start Trigger Text: It sets the trigger text of TCP start, and it is Start by default.



Signal Input Settings

Set and Execute UDP Trigger Mode

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

Steps

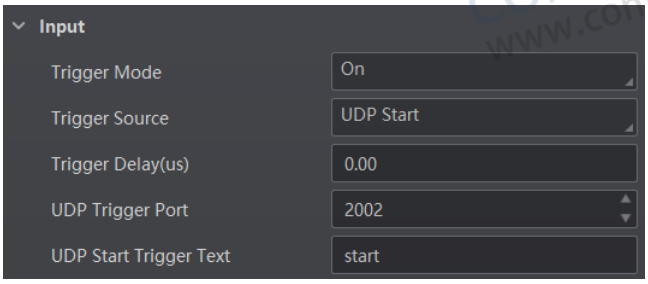
1.Go to I/O Control Settings → Input → Trigger Mode.

2.Select On as Trigger Mode.

3.Select UDP Start as Trigger Source.

4.Set following parameters according to actual demands.

- UDP Trigger Port: It sets the host port of UDP trigger.
- UDP Start Trigger Text: It sets the trigger text of UDP start, and it is Start by default.



Set and Execute Serial Port Trigger Mode

Serial start specifies the serial port as the source for the trigger signal. When the serial port receives the specified string text, the trigger signal will be outputted.

Steps

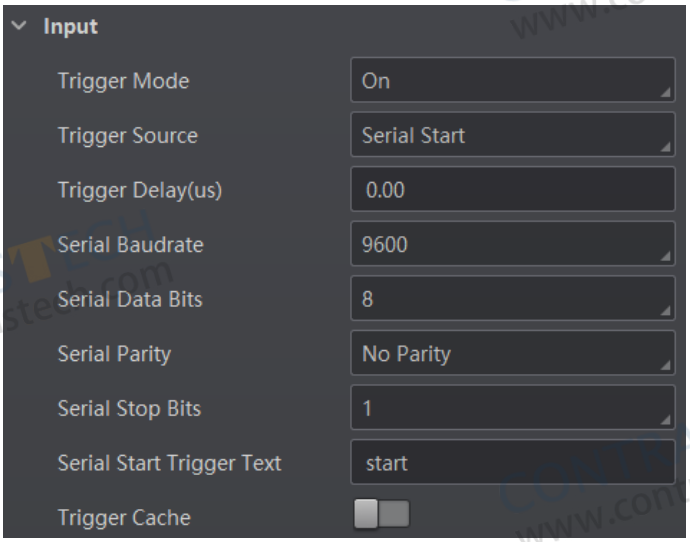
1.Go to I/O Control Settings → Input → Trigger Mode.

2.Select On as Trigger Mode.

3.Select Serial Start as Trigger Source.

4.Serial Baudrate, Serial Data Bits, Serial Parity, and Serial Stop Bits.

5.Set Serial Start Trigger Text that configures the trigger text of serial port start, and it is Start by default.



Signal Input Settings

Set and Execute Self Trigger Mode

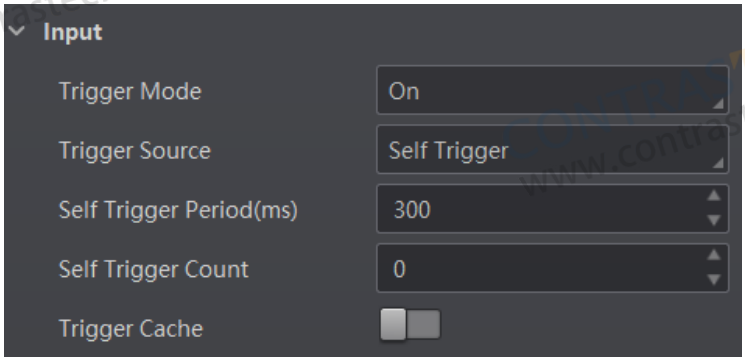
Self trigger allows you to trigger the device according to the trigger period you configured.

Steps

1.Click I/O Control Settings → Input → Trigger Mode.

2.Select On as Trigger Mode.

3.Select Self Trigger as Trigger Source, set Self Trigger Period and Self Trigger Count.



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

Set and Execute Brightness Tigger

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

Steps

1.Click I/O Control Settings → Input → Trigger Mode.

2.Select On as Trigger Mode.

3.Select Brightness as Trigger Source.

4.Set Brightness Sensitivity according to the actual demands.

Signal Input Settings

Stop Trigger

The device supports stopping trigger via TCP, UDP, IO, and serial port. You can also set code reading timeout duration or max. code amount to be read to stop trigger.

Stop Trigger via TCP

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

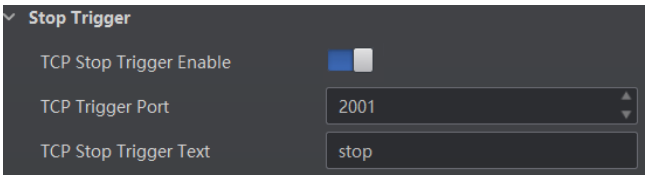
Steps

1.Go to I/O Control Settings → Stop Trigger.

2.Enable TCP Stop Trigger Enable.

3.Set following parameters according to actual demands.

- TCP Trigger Port: It is 2001 by default.
- TCP Stop Trigger Text: It sets the stop trigger text, and it is Stop by default.



Stop Trigger via UDP

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

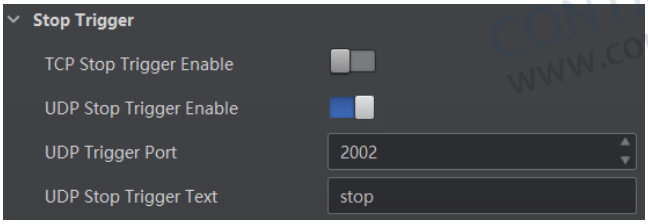
Steps

1.Go to I/O Control Settings → Stop Trigger.

2.Enable UDP Stop Trigger Enable.

3.Set following parameters according to actual demands.

- UDP Trigger Port: It is 2002 by default.
- UDP Stop Trigger Text: It sets the stop trigger text, and it is Stop by default.



Stop Trigger via IO

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

Steps

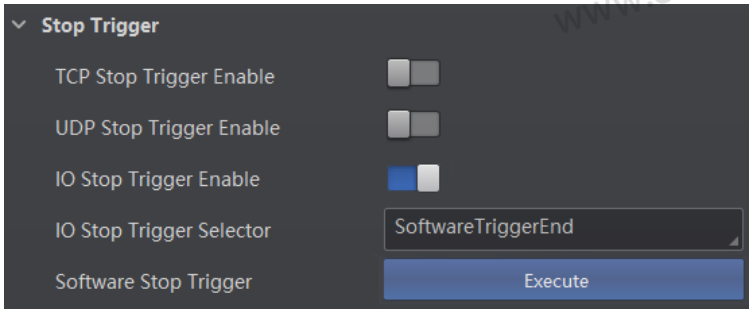
1.Go to I/O Control Settings → Stop Trigger.

2.Enable IO Stop Trigger Enable.

3.Select sources from LineIn 0/1/2 and Software Trigger End as IO Stop Trigger Selector.

4.(Optional) Set trigger activation if LineIn 0/1/2 is selected as IO Stop Trigger Selector.

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



Signal Input Settings

Stop Trigger via Serial

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

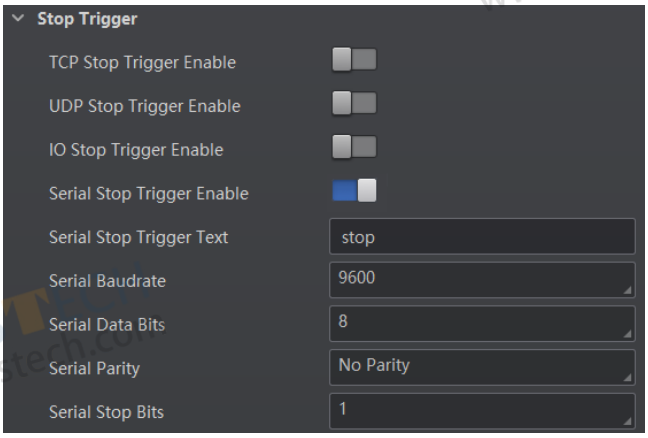
Steps

1.Go to I/O Control Settings → Stop Trigger.

2.Enable Serial Stop Trigger Enable.

3.Set following parameters according to actual demands.

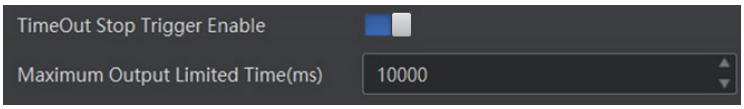
- Serial Stop Trigger Text: It sets the trigger text of serial port stop, and it is Stop by default.
- Serial Baud Rate: It sets the baud rate of the serial port, and it is 9600 by default.
- Serial Data Bits: It sets the data bits of the serial port, and it is 8 by default.
- Serial Parity: It sets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



Stop Trigger via Timeout Duration

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

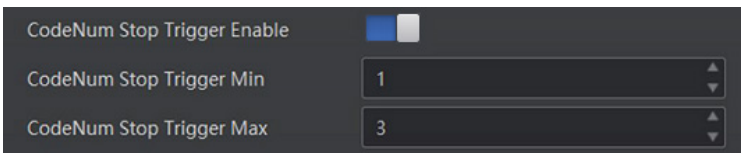
i	The range of Maximum Output Limited Time is between 0 ms and 10000 ms.



Stop Trigger via Code Number

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.

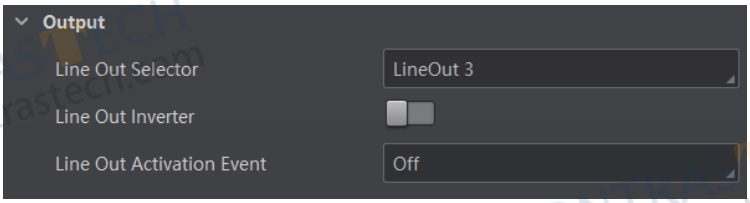
i	● If the outputted code quantity is smaller than configured CodeNum Stop Trigger Min, and the device will output codes continuously. ● If the outputted code quantity is smaller than configured CodeNum Stop Trigger Max, and the device will stop outputting codes. ● If the outputted code quantity is between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



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 signals.



Set Event Source

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

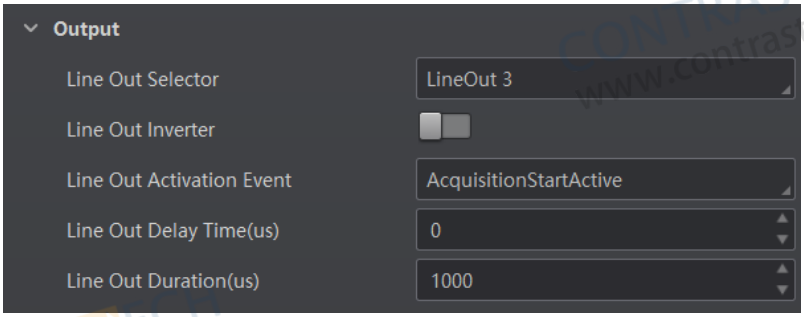
The device supports outputting different trigger signals according to the event source you select. Click I/O Control Settings → Output → Line Out Activation Event to select event source.
The device supports following event sources: Off, Acquisition Start Active, Acquisition Stop Active, Frame Burst Start Active, Frame Burst Stop Active, Exposure Start Active, Soft Trigger Active, Hard Trigger Active, Counter Active, Timer Active, No Code Read, Read Success, Light Strobe Long, Contrast Success, Contrast Fai, and Command Control IO.

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

Select Acquisition Start Active

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

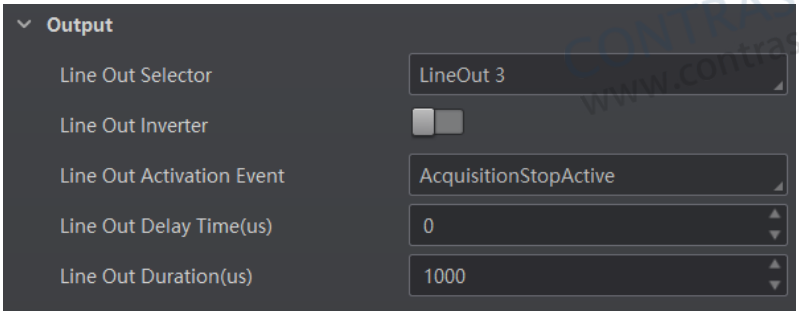
- Line Out Delay Time: It sets the delay time for outputting the output signal.
- Line Out Duration: It sets the time duration of the output signal.



Select Acquisition Stop Active

If you select Acquisition Stop Active as Line Out Activation Event, and you can set its output delay time and duration.

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

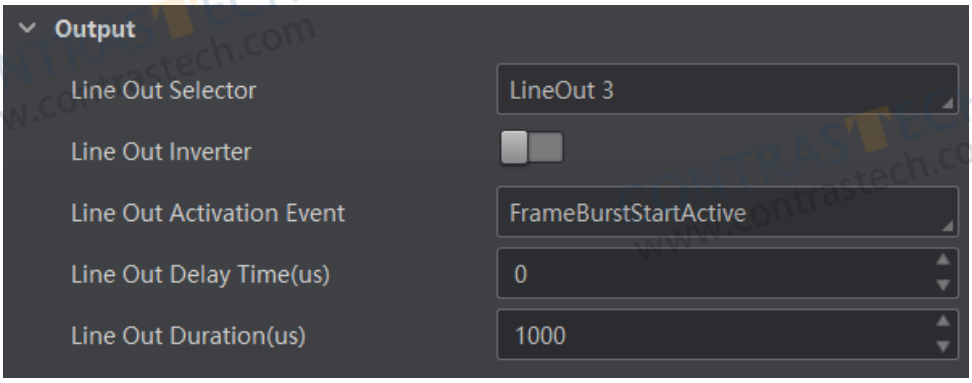


Signal Output Settings

Select Frame Burst Start Active

If you select Frame Burst Start Active as Line Out Activation Event, and you can set its output delay time and duration.

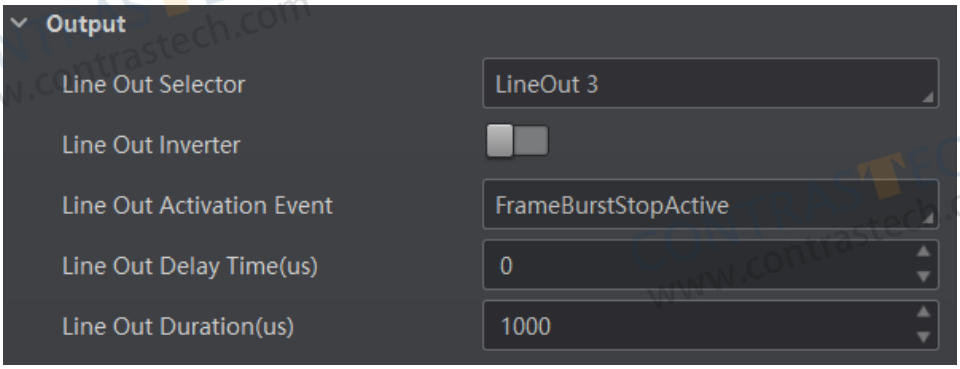
- Line Out Delay Time: It sets the delay time for outputting the output signal.
- Line Out Duration: It sets the time duration of the output signal.



Select Frame Burst Stop Active

If you select Frame Burst Stop Active as Line Out Activation Event, and you can set its output delay time and duration.

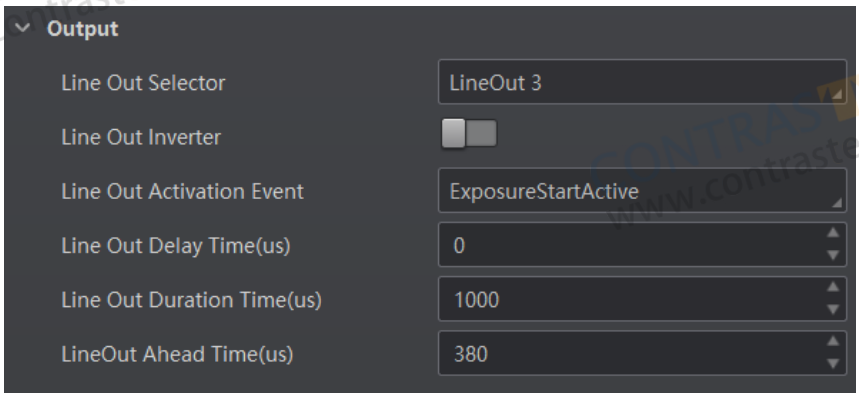
- Line Out Delay Time: It sets the delay time for outputting the output signal.
- Line Out Duration: It sets the time duration of the output signal.



Select Exposure Start Active

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

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

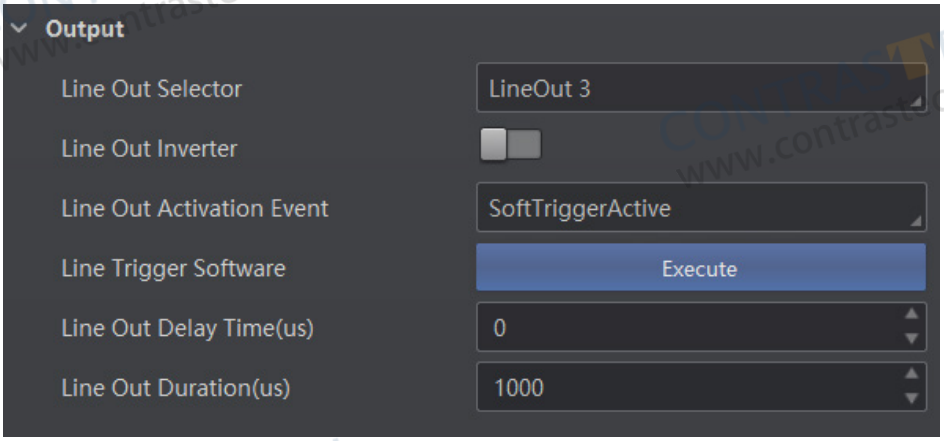


Signal Output Settings

Select Soft Trigger Active

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

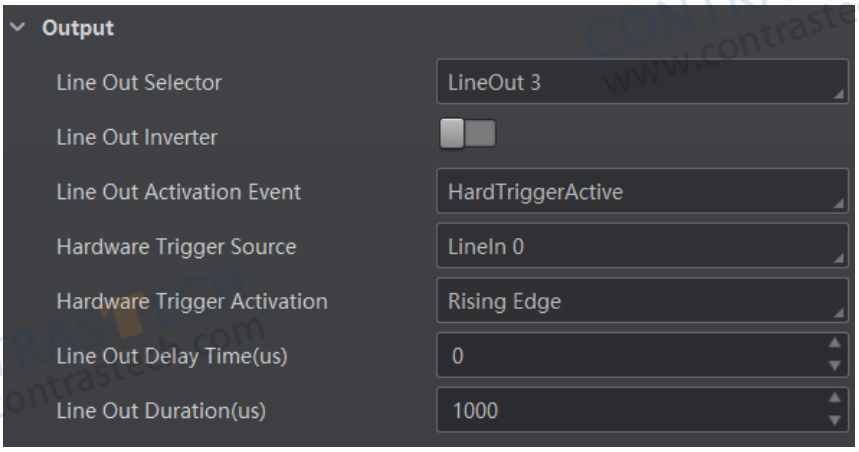
- Line Trigger Software: Click Execute in Line Trigger Software to output the signal manually.
- Line Out Delay Time: It sets the delay time for outputting the output signal.
- Line Out Duration: It sets the time duration of the output signal.



Select Hard Trigger Active

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

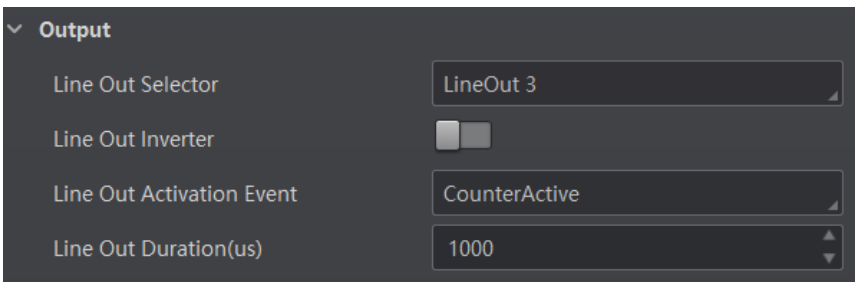
- Hardware Trigger Source: It sets the hardware trigger source.
- Hardware Trigger Activation: It sets the trigger activation of input signal, including Rising Edge and Falling Edge.
- Line Out Delay Time: It sets the delay time for outputting the output signal.
- Line Out Duration: It sets the time duration of the output signal.



Select Counter Active

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

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

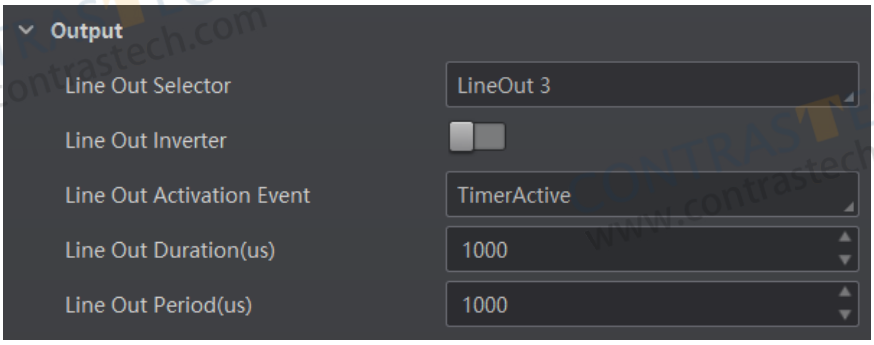


Signal Output Settings

Select Timer Active

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

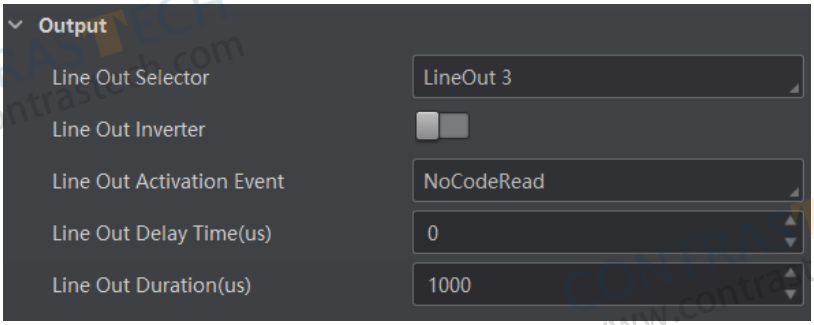
- Line Out Duration: It sets the time duration of the output signal.
- Line Out Period: It sets the time period of the output signal.



Select No Code Read

If you select No Code Read as Line Out Activation Event, and you can set its output delay time and duration.

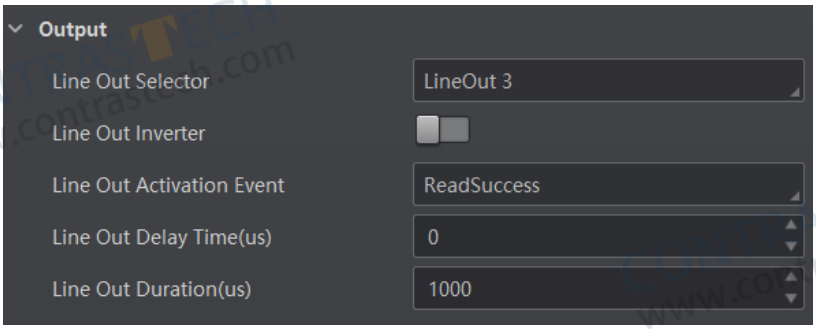
- Line Out Delay Time: It sets the delay time for outputting the output signal.
- Line Out Duration: It sets the time duration of the output signal.



Select Read Success

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

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

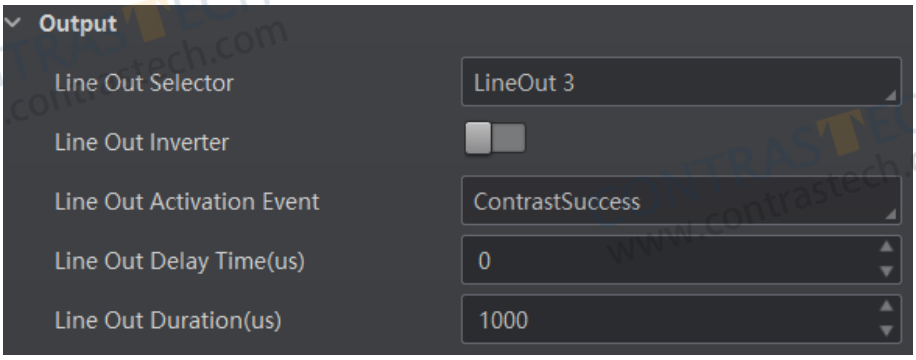


Signal Output Settings

Select Compare Success

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

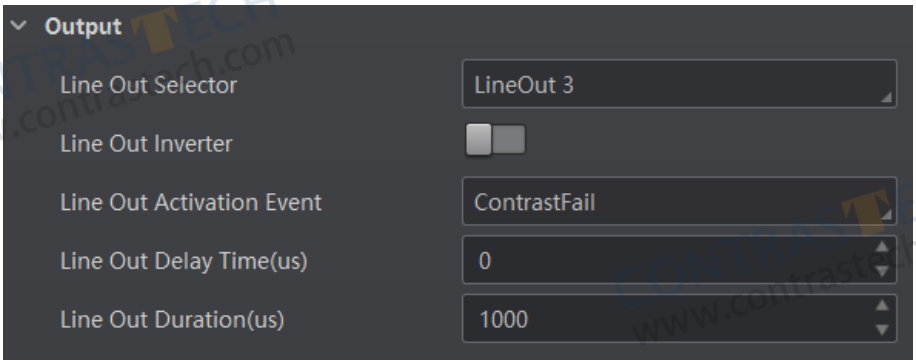
- Line Out Delay Time: It sets the delay time for outputting the output signal.
- Line Out Duration: It sets the time duration of the output signal.



Select Compare Fail

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

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



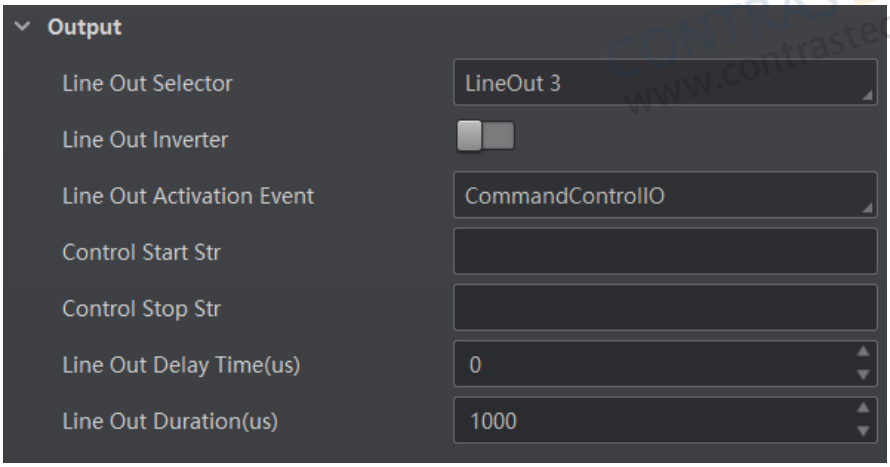
Select Light Strobe Long

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

Select Command Control IO

If you select Command Control IO as Line Out Activation Event, and you do not need to set any parameters.

- Control Start Str: It sets the start string of command control.
- Control Stop Str: It sets the stop string of command control.
- Line Out Delay Time: It sets the delay time for outputting the output signal.
- Line Out Duration: It sets the time duration of the output signal.

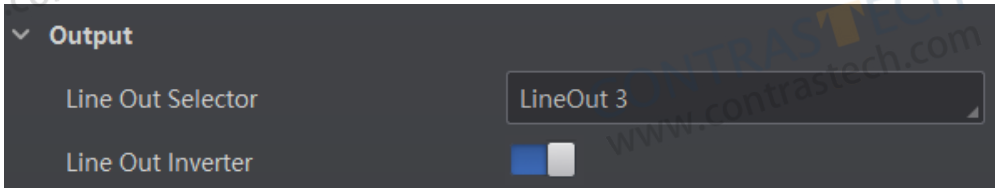


Signal Output Settings

Enable Line Inverter

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

i	The Line Out Inverter function is disabled by default.



Communication Settings

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

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

i	● The supported communication protocols may differ by device models. ● The specific parameters of communication protocols may differ by device models.

Smart SDK

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

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

TCP Client

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

Parameter Name	Description
TCP Protocol	If enabled, the device will output data via the TCP server.
TCP Dst Addr	Enter the IP address of the server that receives data outputted by the code reader.
TCP Dst Port	Enter the port No. of the server that receives data outputted by the code reader.
Heartbeat Enable	If enabled, the software will send heartbeat text.
Barcode as Heartbeat	If enabled, you can set heartbeat text and time.
Heartbeat Text	Enter the content of heartbeat text.
Heartbeat Time	Set the duration of the heartbeat.

Serial

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

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

FTP

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

Parameter Name	Description
FTP Protocol	If enabled, the code reader will output data via FTP server.
FTP Host Addr	IP address of the FTP host.
FTP Host Port	Port No. of the FTP host.
FTP User Name	User name of the FTP.
FTP User PWD	Password of the FTP.

Communication Settings

TCP Server

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

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

MELSEC

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

Parameter Name	Description
MELSEC Protocol Enable	If enabled, the code reader will output data via MELSEC protocol.
MELSEC Server IP	IP address of the Programmable Logic Controller (PLC) connected to the code reader.
MELSEC Server Port	Port number of the Programmable Logic Controller (PLC) connected to the code reader.
MELSEC Frame Type	Frame type of the MELSEC.
MELSEC Network Number	Network number to communicate with.
MELSEC Node Number	Node number to communicate with.
MELSEC Processer Number	Processor number to communicate with.
MELSEC Control Poll Interval	Requested time between successive polls of the control block from the PLC.
MELSEC Control Space	It sets storage space of the control area.
MELSEC Control Offset	It sets the start offset address of the control area.
MELSEC Control Size(Word)	It sets the size of the control area.
MELSEC Status Space	It sets storage space of the status area.
MELSEC Status Offset	It sets the start offset address of the status area.
MELSEC Status Size (Word)	It sets the size of the status area.
MELSEC Result Space	It sets storage space of the result area.
MELSEC Result Offset	It sets the start offset address of the result area.
MELSEC Result Size (World)	It sets the size of the result area.
MELSEC Result Byte Swap	If it is enabled, the client software will swap MELSEC results.
MELSEC Result Timeout	It sets the MELSEC result timeout, and the unit is s.

ModBus

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

Parameter Name	Description
ModBus Enable	If enabled, the code reader will output data via ModBus protocol.
ModBus Mode	Select a mode from Server and Client.
ModBus Control Space	The value is "holding_register" by default and not editable.
ModBus Control Offset	Offset of the control address. The default value is 0.
ModBus Control Size	The value is 1 by default.
ModBus Status Space	It sets status space and it is “holding_register” by default.
ModBus Status Offset	It sets status offset and it is 1 by default.
ModBus Status Size	It is 1 by default.
ModBus Result Space	It set result space and it is “holding_register” by default.
ModBus Result Offset	It is 2 by default.
ModBus Result Size	It is 100 by default.
ModBus Result Byte Swap	If it is enabled, the client software will swap ModBus results.
ModBus Result Timeout (s)	It sets the result timeout of the ModBus protocol.

Communication Settings

UDP

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

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

Fins

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

Parameter Name	Description
Fins Enable	If enabled, the code reader will output data via TCP/UDP FIN.
Fins Server IP	It sets the server IP of Fins.
Fins Server Port	It is 9600 by default.
Fins Control Poll Interval (ms)	It sets how often read data.
Fins Control Space	It sets storage space of the control area.
Fins Control Offset	It sets the start offset address of the control area.
Fins Control Size (Word)	It sets the size of the control area.
Fins Status Space	It sets storage space of the status area.
Fins Status Offset	It sets the start offset address of the status area.
Fins Status Size (Word)	It sets the size of the status area.
Fins Result Space	It sets storage space of the result area.
Fins Result Offset	It sets the start offset address of the result area.
Fins Result Size (Word)	It sets the size of the result area.
Fins Result Byte Swap	If it is enabled, the client software will swap Fins results.
Fins Result Timeout (s)	It sets the Fins result timeout, and the unit is s.

Data Processing Settings

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

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

■ Filter Rule

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

Normal Filter Mode

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

● Instant Output Mode Enable: If enabled, the device will output barcode data immediately once a code is read. If not enabled, the barcode data will be outputted after the device trigger process ends.

i	The parameter is only available when the running mode is set to Normal mode and the trigger mode is enabled.

● Min. Output Time(ms) : Define the minimum time duration (unit: ms) for data output. The duration starts from trigger time. Note: The parameter is only available when the running mode is set to Normal mode and the trigger mode is enabled.

i	The parameter is only available when the running mode is set to Normal mode and the trigger mode is enabled.

● Min. Code Length: If the length of a barcode is shorter (in terms of the number of characters) than the configured value, the device will NOT parse the barcode.
For example, if you set the value to 6, the device will not parse the barcodes which contain fewer than 6 characters.

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

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

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

● Numeral Filter: If enabled, the device will only parse and read the numeral contents of the barcodes, and the non-numeral contents will be filtered out.

● Begin with Specific Character for Result: enabled, the device will only read the barcodes which begin with a specific character string.

● Begins with: Enter the character string.

● Include Specific Character in Barcode: If enabled, the device will only read the barcodes which include a specific character string.

● Character: Enter the character string.

● Exclude Specific Character in Barcode: If enabled, the device will only read the barcodes without a specific character string.

● Character: Enter the character string.

● Remove Duplicate By ROI: If it is enabled, the device will filter information based on drawn ROIs.

● Read Times Threshold: If the reading results of a barcode is same for the configured times, the barcode will be regarded as valid and its data will be outputted. Or the barcode will be regarded as invalid and its data will not be outputted.

Data Processing Settings

Regular Expression Filter Mode

The device supports filtering codes via the regular expression.

Steps

1.Select Regular Expression as the Filter Mode, and click Set in Regular Expression Filter to enter regular expression filter settings window.

2.Import local files or add customized filter rules to set the regular expression.

- Import local files: Click Import to import local .xml files, and click OK to finish.
- Add customized filter rule: Click Add and set related parameters in the popped-up window, and click OK after configuring parameters.

Parameter Name	Description
Rule Name	The default rule name is Rule 1, and you can edit it according to actual demands.
Length Limit	It sets the length range of the code, and its upper limit is 256.
Start With	It sets the specific start with code. You can use semicolon to separate if there are multiple characters. If multiple characters are used, code meeting one of these characters is valid.
End With	It sets the specific end with code. You can use semicolon to separate if there are multiple characters. If multiple characters are used, code meeting one of these characters is valid.
Not Start With	It excludes the specific start with code. You can use semicolon to separate if there are multiple characters. If multiple characters are used, code meeting one of these characters is valid.
Not End With	It excludes the specific end with code. You can use semicolon to separate if there are multiple characters. If multiple characters are used, code meeting one of these characters is valid.
Included	It sets the code with specific content. You can use semicolon to separate if there are multiple characters. If multiple characters are used, code meeting all these characters is valid.
Excluded	It sets the code without specific content. You can use semicolon to separate if there are multiple characters. If multiple characters are used, code meeting all these characters is valid.
Other Conditions	You can select uppercase, lowercase, digit or Chinese.

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

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

4. (Optional) Click to delete unwanted filter rules.

5. (Optional) Click Export to export configured filter rules to local PC.

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

Data Processing Settings

Data Processing Settings

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

i	● The actual parameters displayed may vary with different communication protocols. For details about communication settings, refer to Communication Settings. ● The specific parameters and parameter order may differ by the device's operation mode, trigger mode, device models and firmware versions.

SmartSDK

● Sorting Rules: Specify the sorting rules of output images. Multiple sorting rules are supported.

● One By One Enable: If it is enabled, the device will send one piece of code information each time in accordance with the specified interval. You can set the interval via One By One Interval and the default value 100 ms.

● Local Save Picture Mode: It includes Off, NoRead, and Insufficient Code. You can select NoRead to let the device save images when no code is read.

FTP

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

● Sorting Rules: Specify the sorting rules of output images. Multiple sorting rules are supported.

● One By One Enable: If it is enabled, the device will send one piece of code information each time in accordance with the specified interval. You can set the interval via One By One Interval and the default value 100 ms.

● Local Save Picture Mode: It includes Off, NoRead, and Insufficient Code. You can select NoRead to let the device save images when no code is read.

● Local Picture Type: Specify the type of pictures saved locally. You can select JPEG or BMP.

● Output Retrans Enable: Enable to allow data re-transmission. Specify the limit of re-transmission attempts in Output Retrans Number.

● FTP Picture Name Format: Click + to select one or multiple items to be contained in the picture name. The selected items will be displayed in the frame. You can also enter more contents directly in the frame.

● FTP Transmission Conditions: Set the condition to upload the data outputted by the device to FTP server.

○ All: Always upload the data.

○ ReadBarcode: Upload the data only when the barcode is read by the device.

○ NoReadBarcode: Upload the data only when no barcode is read by the device.

● FTP Transmission Result Contain: Select contents to upload to the FTP server.

○ JustResult: Only upload the content of the barcode.

○ JustPicture: Only upload the barcode image.

○ ResultAndPicture: Upload both the content of the barcode and the barcode image.

● FTP Time Format: Select a format type from the drop-down list for the time stamp contained in the file name.

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

● FTP Save Picture Strategy: Select from the drop-down list the picture saving strategy from Recent Frame, All Frames, Range Frames, and Specific Frame accordingly. If Specific Frame is selected, you can specify the frame by entering its index in the box of FTP Picture Index.

● FTP Picture Index: Set the picture index.

Data Processing Settings

TCP Client / Serial / TCP Server / MELSEC / Modbus / UDP / FINS

When the communication protocol is TCP Client / Serial / TCP Server / MELSEC / Modbus / UDP / FINS, set the following parameters of data processing.

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

- Sorting Rules: Specify the sorting rules of output images. Multiple sorting rules are supported.
- One By One Enable: If it is enabled, the device will send one piece of code information each time in accordance with the specified interval. You can set the interval via One By One Interval and the default value 100 ms.
- Local Save Picture Mode: It includes Off, NoRead, and Insufficient Code. You can select NoRead to let the device save images when no code is read.
- *** Output Format: Click + to select one or multiple items to be contained in the picture name. The selected items will be displayed in the frame. You can also enter more contents directly in the frame.
- *** Output Noread Enable: Enable this to set the default output content if no barcode is read during transmission. Edit the output text in Output NoRead Text.
- *** Output Start Text: The contents of the start part of the data outputted. You can set the contents as desired.
- *** Output Stop Text: The contents of the end part of the data outputted. You can set the contents as desired.
- *** Output Barcode Enter Character Enable: Whether to show input character in the data.
- *** Output Barcode Newline Character Enable: Whether to show new-line character in the data.

Contrast Control Settings

i	You need to set device's operation 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.

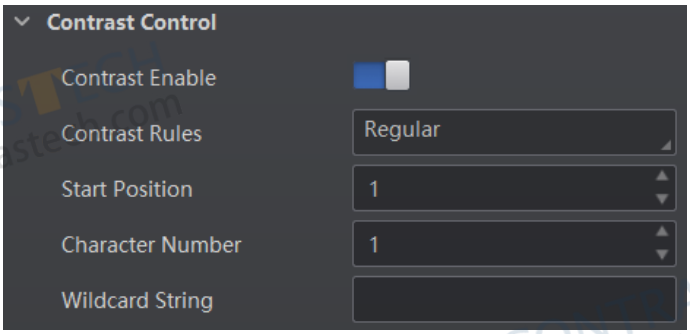
2.Go to Contrast Control, enable Contrast Enable, and select Regular as Contrast Rules.

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.

i	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.

i	● 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.

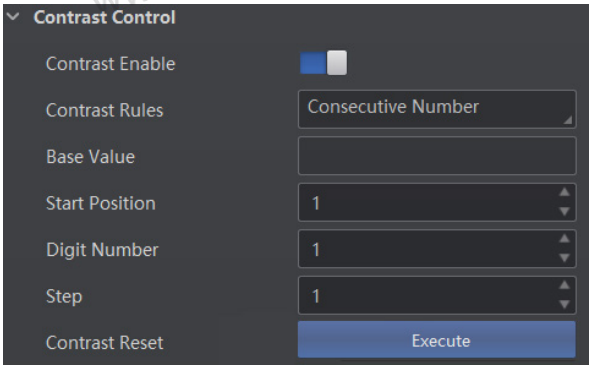
Here we take start position (3), digital number (2) and step (2) as an example to explain the consecutive number comparison:

● 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).



Statistics Information

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

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

Steps

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

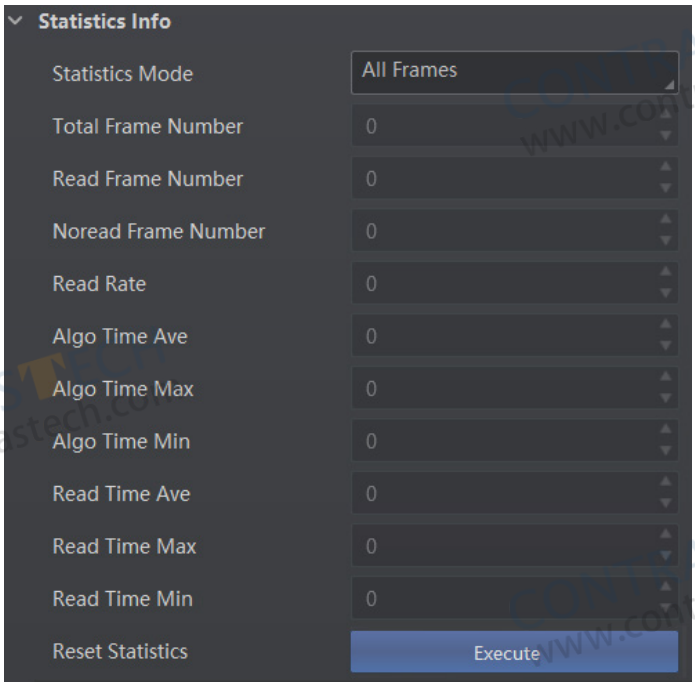
2.Go to feature tree, find Statistics Info., and select Statistics Mode:

- All Frames means the client software will display all data since the device is powered on.
- Latest Frames means the client software will display data of the last 10 frames.

3.View related parameters.

4.(Optional) Click Execute in Reset Statistics to reset statistics information.

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.



Diagnose Event Report

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

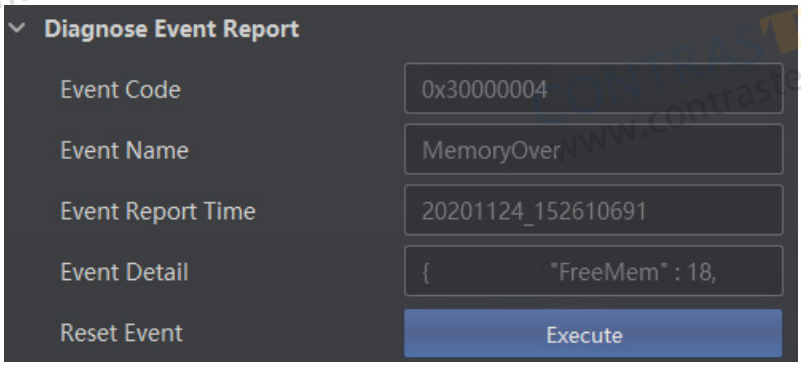
Steps

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

2.Go to feature tree, find Diagnose Event Report.

3.View relation information.

4.(Optional) Click Execute in Reset Event to clear all information.



User Set Customization

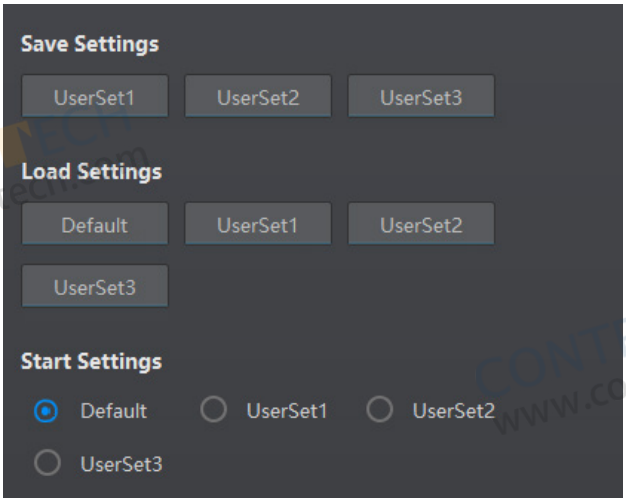
In Configuration Management, you can set and manage the user set. A user set is a group of parameter values with all the settings needed to control the device, and you can save, load and switch different user sets.

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

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

i	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.



CHAPTER 5 DEVICE OPERATION

Set Time

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

Steps

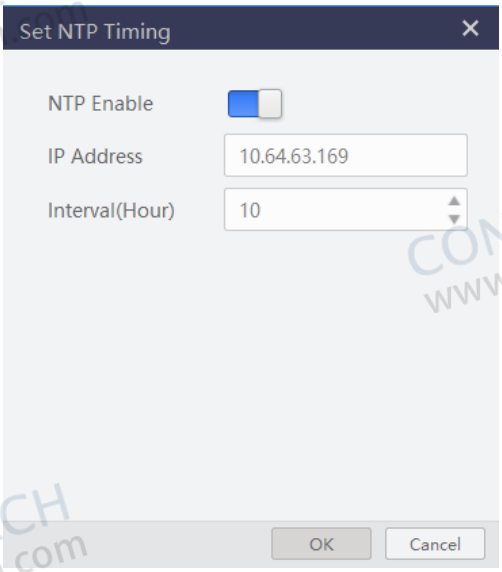
1.Go to Config Management, and find Timing.

2.Click Setting and enable NTP Enable.

3.Set parameters according to actual demands.

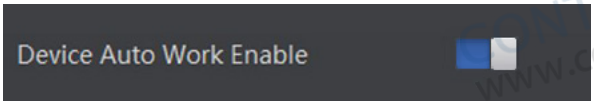
i	Configure NTP server settings before using NTP time synchronization function.

4. Click OK after settings.



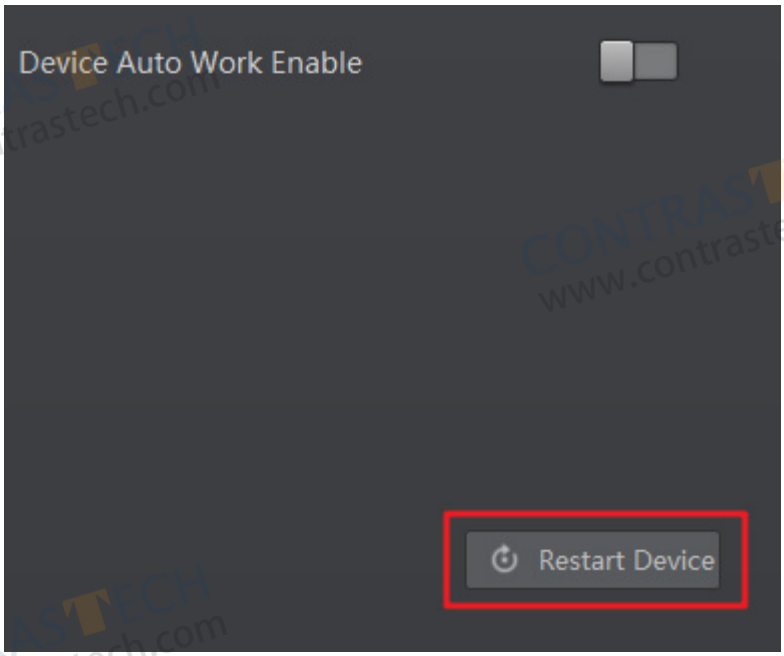
Enable Device Auto Work

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.



Restart Device

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



CHAPTER 6 I/O WIRING

The device's 12-pin connector has three opto-isolated inputs (LineIn 0/1/2), three opto-isolated outputs (LineOut 3/4/5), and one RS-232 serial port. This section introduces the I/O electrical feature and I/O wiring.

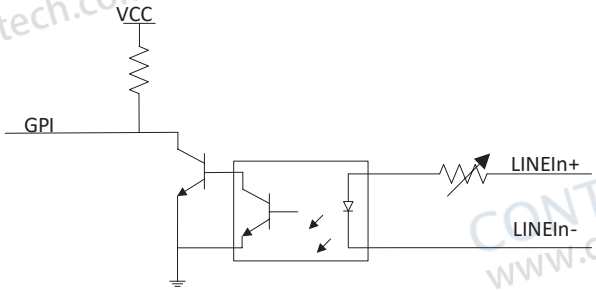
I/O Electrical Feature

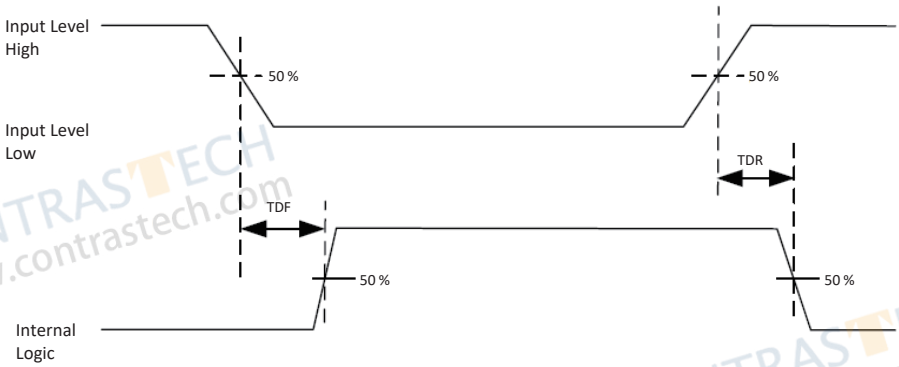
This section introduce the electrical feature of opto-isolated input and opto-isolated output.

Input Signal

The device's LineIn 0/1/2 are opto-isolated inputs, and their internal circuit is as follows.

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





Input Electrical Feature:

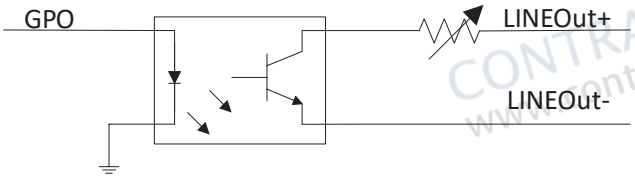
Parameter Name	Parameter Symbol	Value
Input Logic Level Low	VL	1.5 V
Input Logic Level High	VH	2 V
Input Rising Delay	TDR	7 μs
Input Falling Delay	TDF	81.6 μs

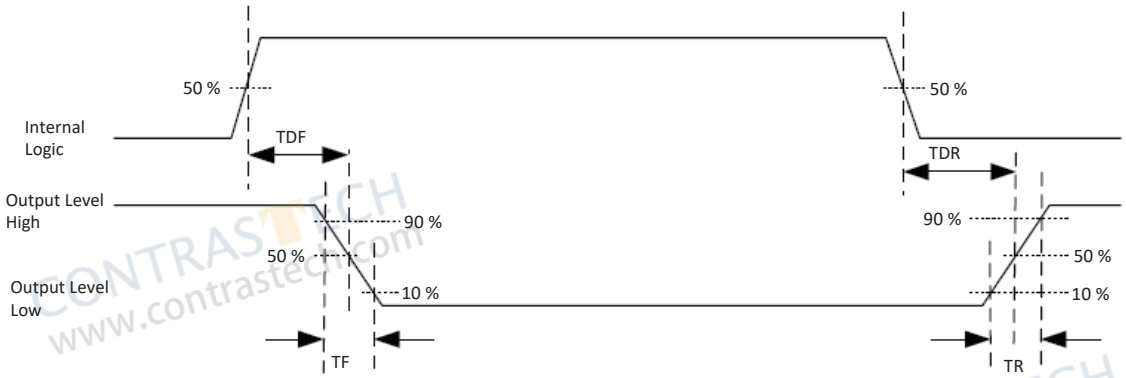
I/O Electrical Feature

Output Signal

The device's LineOut 3/4/5 are output signals, and their internal circuit is as follows.

- The output voltage ranges from 5 VDC to 30 VDC.
- The maximum output current is 45 mA.
- Do not directly connect with inductive load (e.g. DC motor, etc.) when outputting.
- 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	730 mV
Output Logic Level High	VH	3.2 V
Output Rising Time	TR	60 μs
Output Falling Time	TF	3 μs
Output Rising Delay	TDR	68 μs
Output Falling Delay	TDF	6.3 μs

I/O Wiring

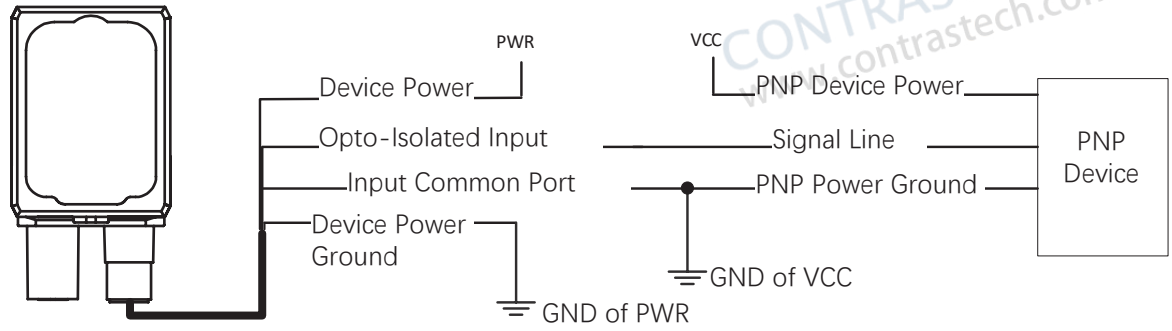
The device receives an externally input signal or output a signal to an external device through its 12-pin connector. This section introduces how to wire the I/O parts.

> Here we take LineIn 0 as an example to introduce input signal wiring, and take LineOut 0 as an example to introduce output signal wiring.

Input Signal Wiring

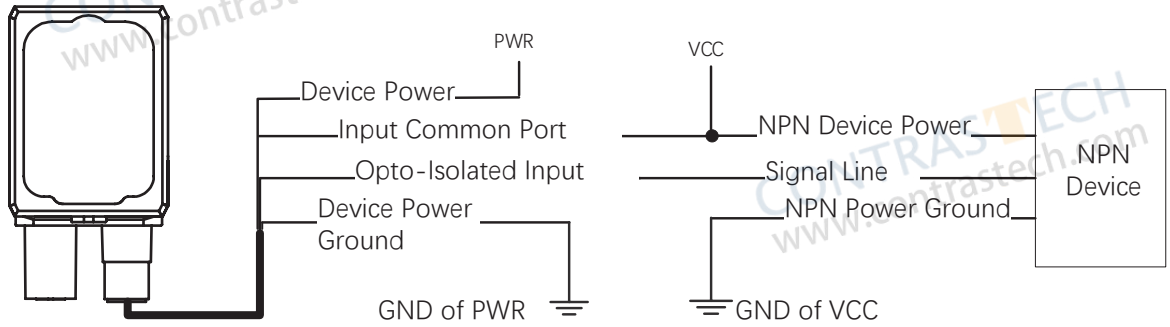
Input signal wiring may differ by external device types.

PNP Device

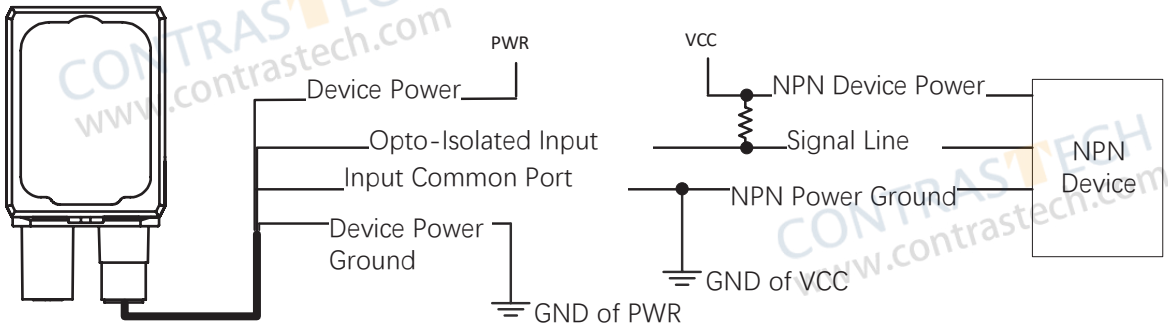


NPN Device

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



If the VCC of NPN device is 12 VDC or 24 VDC and 1 KΩ pull-up resistor is used, its wiring is as follows.

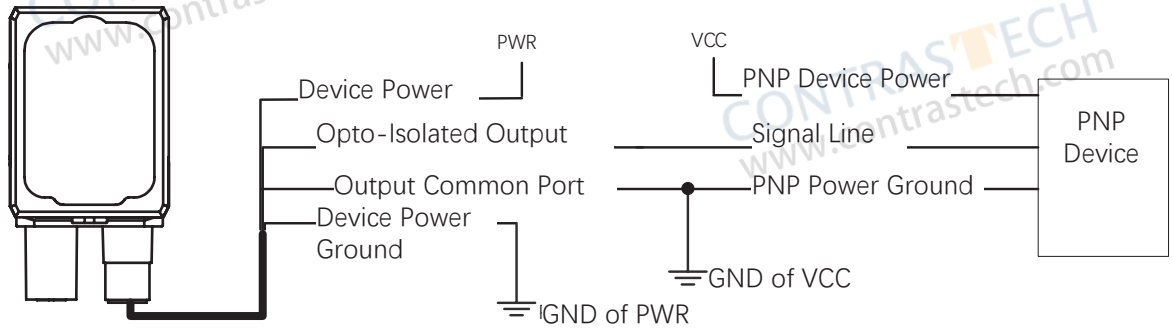


I/O Wiring

Output Signal Wiring

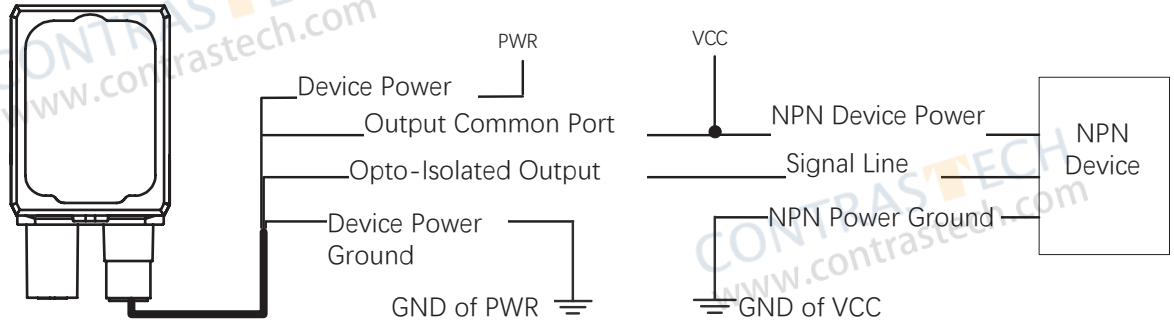
i	● Output signal wiring may differ by external device types. ● The voltage of VCC should not higher than that of PWR. Otherwise, the device' s output signal may have exception.

PNP Device

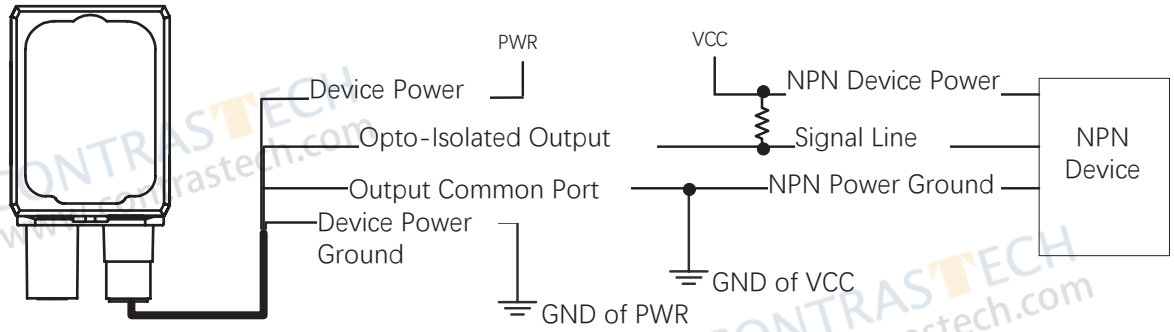


NPN Device

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



If the VCC of NPN device is 12 VDC or 24 VDC and 1 KΩ pull-up resistor is used, its wiring is as follows.

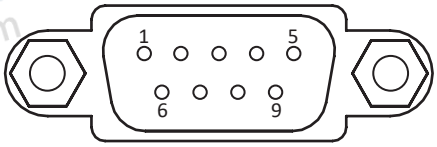


RS-232 Serial Port

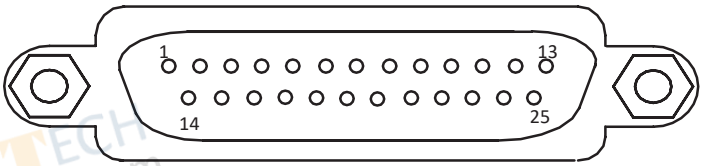
The device supports outputting via the RS-232 serial port.

RS-232 Serial Port Introduction

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.



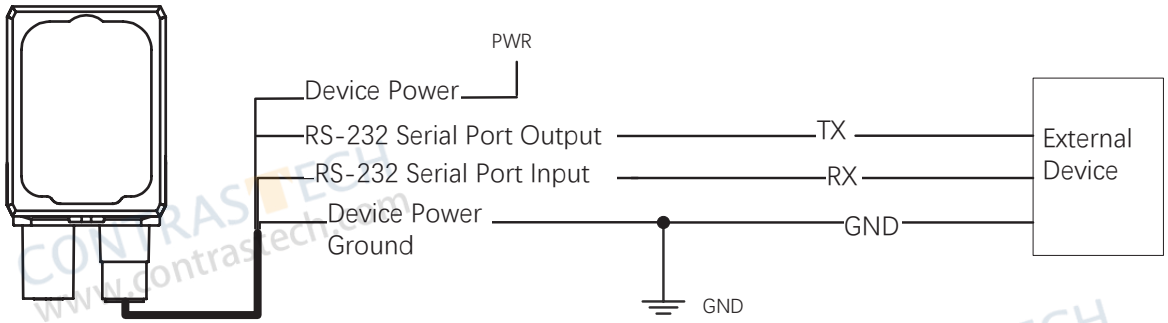
Pin No.	Name	Function
2	RX	Receive data
3	TX	Send data
5	GND	Signal ground



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.



CHAPTER 7 OTHER FUNCTIONS

Trouble Shooting

PROBLEM	Reason	Solution
Run client, there is no listed device.	The device is powered off.	Check the device's power connection (observe whether the top indicator is in blue color or not) to make sure the device is powered up normally.
	Network exception.	Check the network connection (the top indicator is solid yellow if the network exception occurs) to make sure the device can be connected to the network normally, and make sure that the PC and the device are in the same network segment.
All black or too dark during preview.	Insufficient brightness of supplement light.	Increase the brightness of light source appropriately, or change to a brighter one.
	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.

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			

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