

# **DM8700 Industrial Code Reader**

## **User Manual**



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## 1. Product Introduction

### 1.1 Product Description

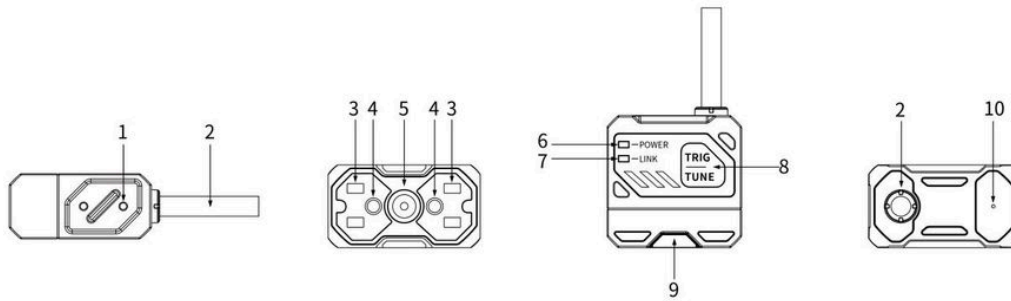
This manual applies to the Tipcode Scanner DM8700 Series Smart Code Reader. It can be used in industries such as 3C products, food and medicine, electronics and semiconductors, and automotive parts. The device captures images of the measured object through sensors and optical components, and uses the built-in deep-learning code reading algorithm to parse barcodes. The device can also output inspection results through multiple communication methods.

### 1.2 Main Features

- Compact body size, suitable for installation in confined spaces.
- Uses a liquid lens and built-in Tipcode self-developed Cube-A Technology focusing algorithm to achieve high-speed focus adjustment.
- The Tune key on the device body supports one-touch automatic parameter tuning, reducing on-site commissioning time.
- Supports reading of ultra-small codes and meets reading requirements at different distances.
- Provides red/white dual-color light sources and supports polarized light sources for complex scenarios.
- Aviation connector design with single-cable connection for simpler wiring.



### 1.3 Appearance Introduction

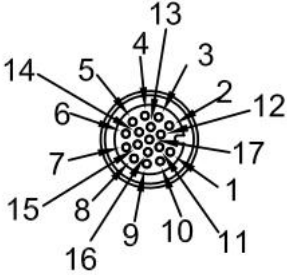


| No. | Name                          | Description                                                                                                                        |
|-----|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Screw Hole                    | Mounting hole for the smart code reader, used to secure the device.                                                                |
| 2   | Connection Cable              | M12 17-pin cable providing power, Ethernet, I/O, and conventional function wires.                                                  |
| 3   | Light Source                  | Built-in red/white light source used for supplemental lighting during image acquisition to ensure image quality.                   |
| 4   | Aiming Light                  | Indicates the center position of the image and helps aim at the target.                                                            |
| 5   | Image Sensor                  | Used to acquire images.                                                                                                            |
| 6   | POWER Indicator               | Green when the device is operating normally; off when not running.                                                                 |
| 7   | LINK Network Indicator        | Green and flashing when network communication is normal.                                                                           |
| 8   | TRIG Key / TUNE Key           | Trigger / one-touch tuning key. Click once to trigger image capture; press and hold for 5 s to perform one-touch parameter tuning. |
| 9   | Code Reading Status Indicator | Green for OK, red for NG, and yellow in standby.                                                                                   |
| 10  | Buzzer                        | Provides an audible prompt when decoding succeeds or fails.                                                                        |

### 1.4 Interface and Flying Lead Definitions

The device uses an M12 17-pin interface. The specific pin signal definitions are shown in the original figure.

When wiring the device, connect each wire according to the pin numbers in the table and the colors on the cable labels.

| <b>M12 17-pin Male Connector</b><br><br> | Pin | Signal    |
|---------------------------------------------------------------------------------------------------------------------------|-----|-----------|
|                                                                                                                           | 1   | DC_24V    |
|                                                                                                                           | 2   | -         |
|                                                                                                                           | 3   | -         |
|                                                                                                                           | 4   | RS232_TXD |
|                                                                                                                           | 5   | RS232_RXD |
|                                                                                                                           | 6   | ENET_TX+  |
|                                                                                                                           | 7   | ENET_RX-  |
|                                                                                                                           | 8   | LINE_IN0  |
|                                                                                                                           | 9   | IN_COM    |
|                                                                                                                           | 10  | LINE_IN1  |
|                                                                                                                           | 11  | GND       |
|                                                                                                                           | 12  | LINE_OUT0 |
|                                                                                                                           | 13  | -         |
|                                                                                                                           | 14  | ENET_TX-  |
|                                                                                                                           | 15  | ENET_RX+  |
|                                                                                                                           | 16  | LINE_OUT1 |
|                                                                                                                           | 17  | LINE_OUT2 |

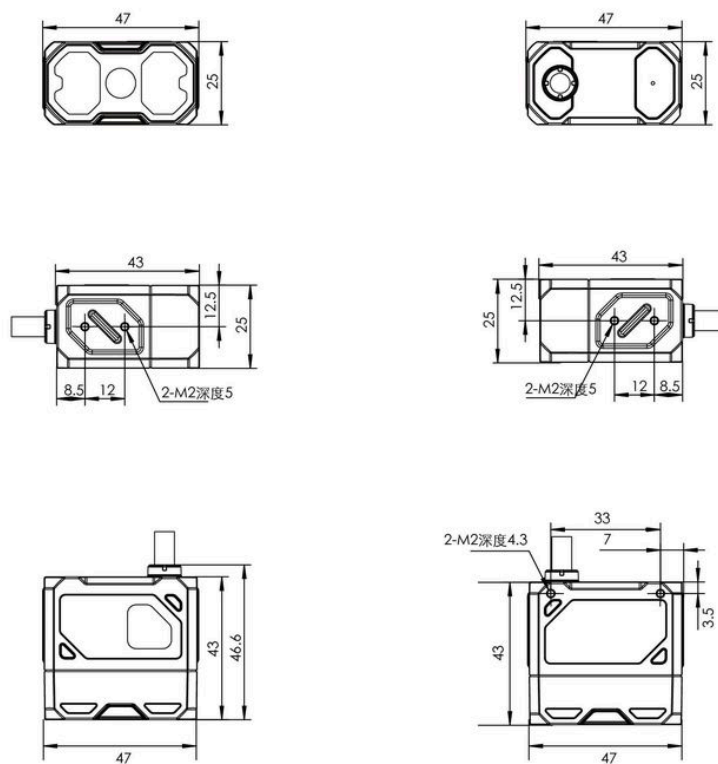
## 1.5 Accessories

To use the device properly, prepare the following accessories before installation.

| Accessory Name            | Description                                              |                                                                                      |
|---------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------|
| Cable                     | M12 17-pin cable for connecting to the device interface. |  |
| Power Supply              | 24 V power adapter, optional.                            |  |
| L-shaped Mounting Bracket | L-shaped mounting bracket with screws, optional.         |  |

## 1.6 Hardware Dimensions

单位:mm



## 2. Device Installation and Operation

### 2.1 Device Installation

Install the device onto a fixed bracket with screws, and then install the fixed bracket onto other mechanical components.

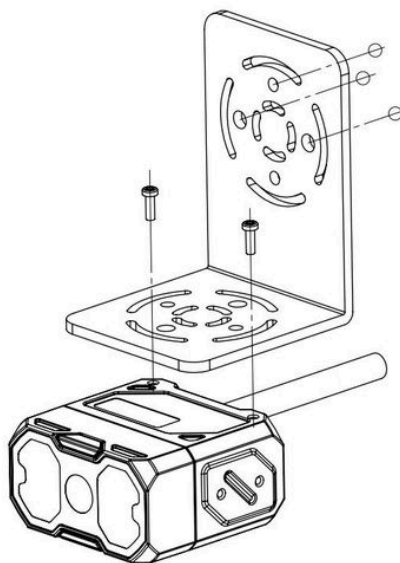


Figure: Front mounting

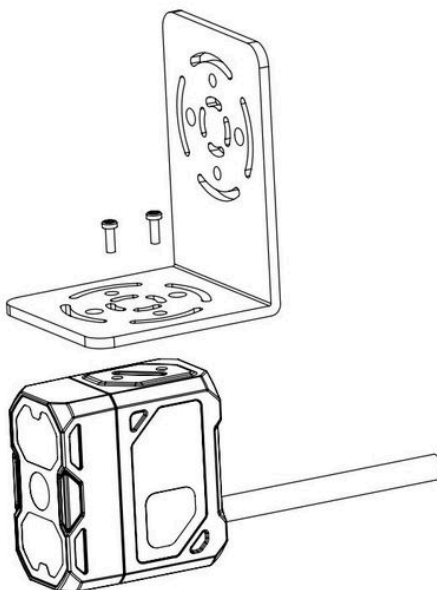
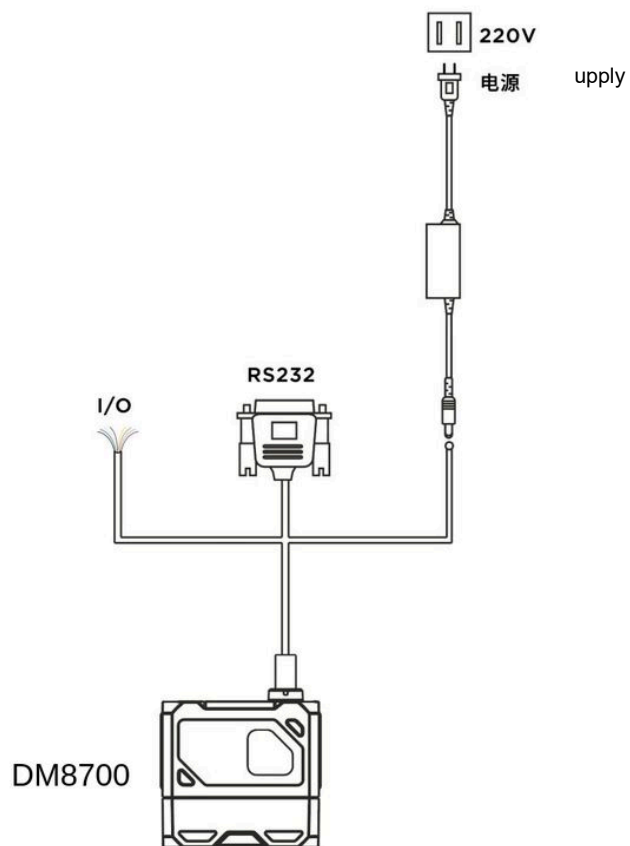


Figure: Side mounting.

For the DM8700 liquid-lens variable-focus code reader, the working distance is 40 mm to 300 mm. Install the device at an inclination angle of 10 to 15 degrees to avoid light spots and reflections.

## 2.2 Power Connection

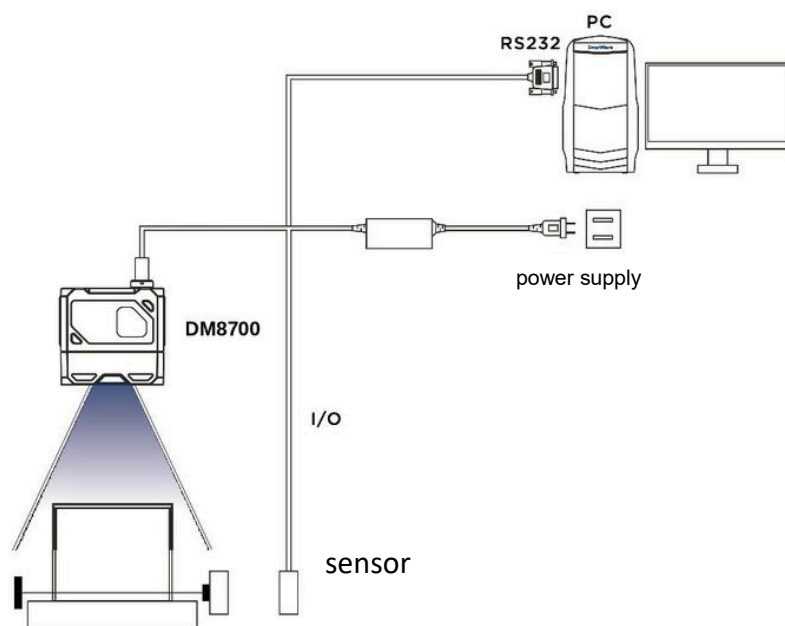
The power supply supports 24 V DC, maximum 3 A. Two power supply methods are supported: direct 24 V DC connection, or 220 V AC connection through an adapter.



## 2.3 Communication Connection

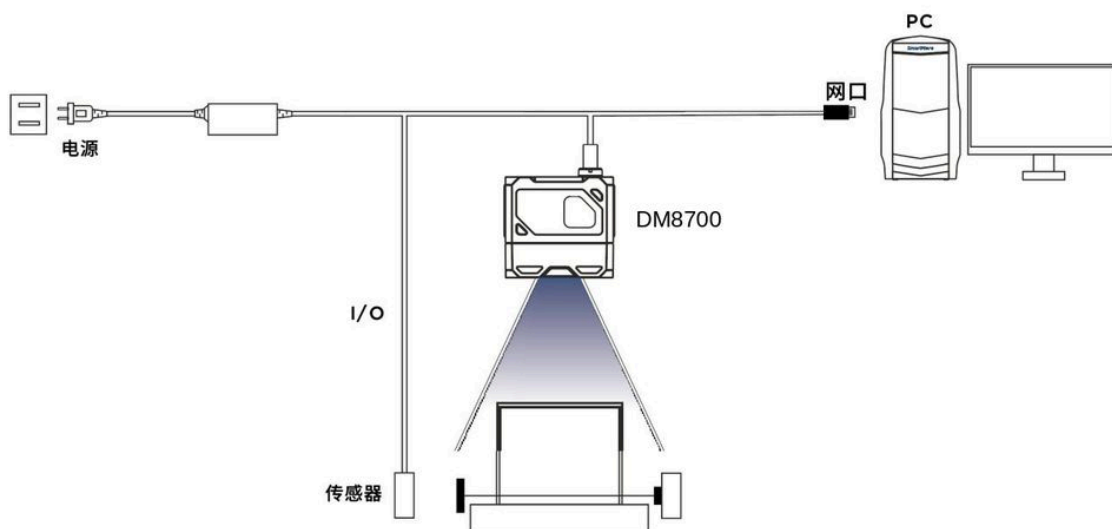
### A. RS-232 Serial Connection

The default baud rate is 9600, parity: NULL, data bits: 8, stop bits: 1. Actual parameters can be changed in the debugging software.



## B. Ethernet Connection

The default IP address is 169.254.153.0, and the default data port is 15000.



### 3. I/O Electrical Characteristics and Wiring

The DM8700 Smart Code Reader has two opto-isolated inputs and three non-isolated outputs.

#### 3.1 I/O Electrical Characteristics

In the device I/O signals, LineIn0/1 are opto-isolated inputs, and LineOut0/1/2 are non-isolated outputs.

##### 3.1.1 Input Electrical Characteristics

| Parameter Name           | Symbol | Value |
|--------------------------|--------|-------|
| Input logic low level    | VOL    | 6 V   |
| Input logic high level   | VOH    | 12 V  |
| Input falling-edge delay | TDF    | 10 us |
| Input rising-edge delay  | TDR    | 47 us |

Note: The input logic low or high level indicates the threshold value of the input voltage. The input rising/falling delay indicates device performance.

##### 3.1.2 Output Electrical Characteristics

| Parameter Name            | Symbol | Value                                   |
|---------------------------|--------|-----------------------------------------|
| Output logic low level    | VOL    | 0.7 V maximum                           |
| Output logic high level   | VOH    | Depends on the pull-up resistor voltage |
| Output falling-edge delay | TDF    | 20.3 ns                                 |
| Output rising-edge delay  | TDR    | 550 ns                                  |
| Output fall time          | TF     | 12 ns                                   |
| Output rise time          | TR     | 3.5 us                                  |

##### 3.1.3 Input Internal Wiring Diagram

Input signal: In the device I/O signals, In0/1 are opto-isolated inputs. The input voltage range is 0 to 24 VDC.

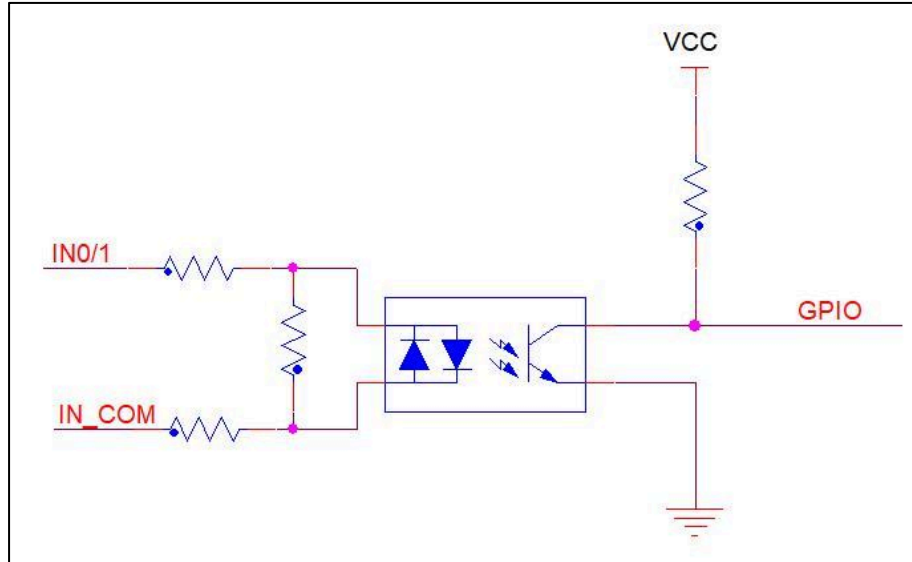


Figure: Device input circuit diagram.

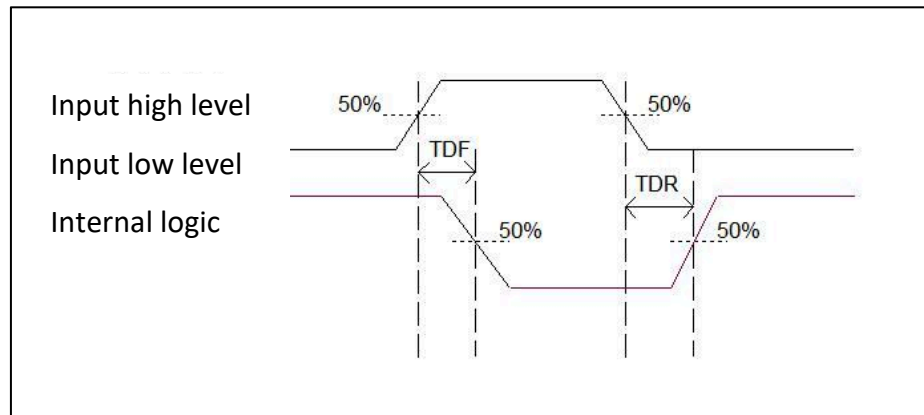


Figure: Input logic level diagram.

### 3.1.4 Output Internal Wiring Diagram

Output signal: In the device I/O signals, LineOut0/1/2 are outputs. The output can drive a VCC voltage up to 28 V, and the output current must not exceed 30 mA. Note that inductive devices are not supported.

Internal logic

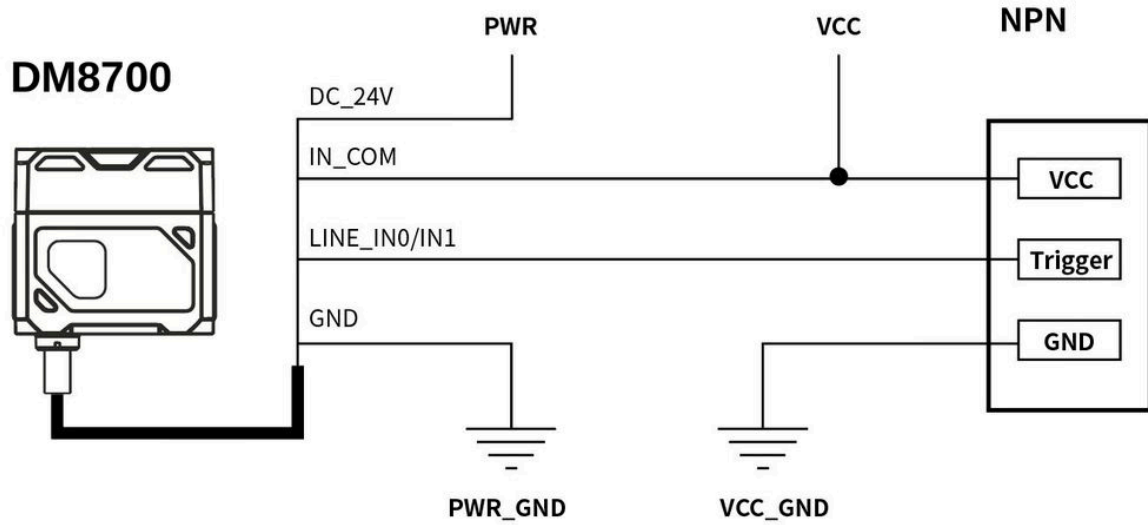
Output high level

Output low level

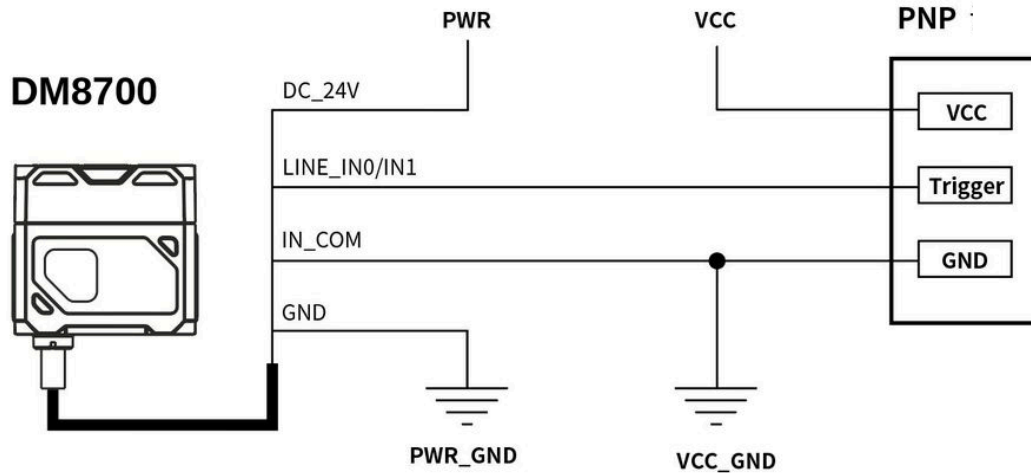
The diagram illustrates the timing of a digital signal transition. It shows three signals: 'Internal logic' (top), 'Output high level' (middle), and 'Output low level' (bottom). The 'Internal logic' signal transitions from low to high and then back to low. The 'Output high level' signal transitions from low to high, and the 'Output low level' signal transitions from high to low. The transition times are labeled as TDF (output delay from internal logic high) and TDR (output delay from internal logic low). The output signals are shown with voltage levels at 50%, 90%, and 10% to indicate the timing of the transition. The output delay times are labeled as TF (output delay from internal logic high) and TR (output delay from internal logic low).

The input wiring differs depending on the device type.

Input signal is NPN.



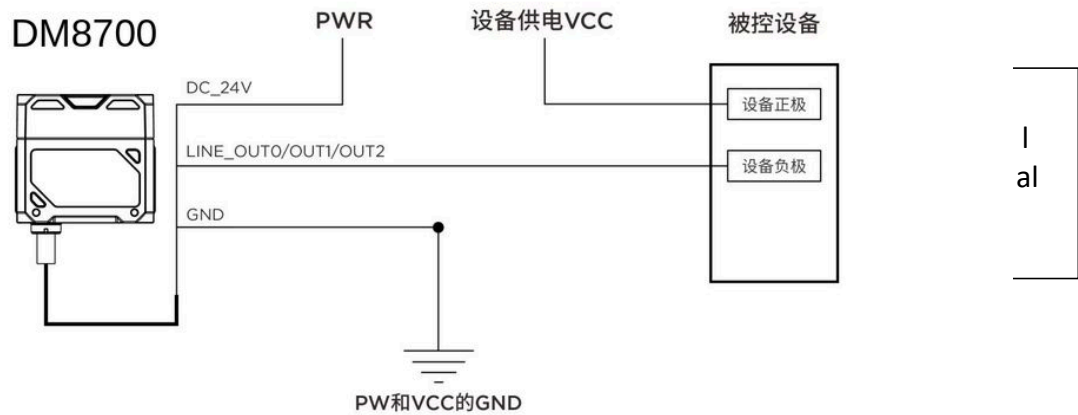
Input signal is PNP.



### 3.2.2 Output External Wiring Diagram

The output wiring differs depending on the device type.

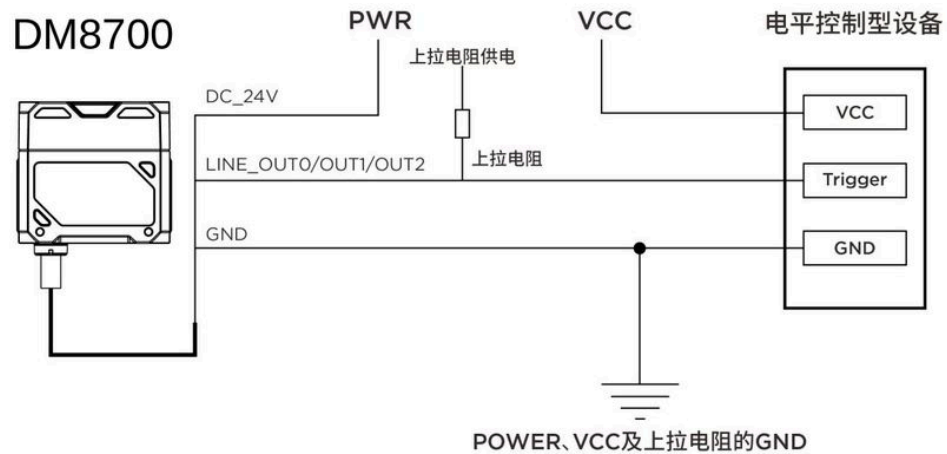
If the external device is an optocoupler, alarm, indicator light, or another device that requires direct control of the device power supply circuit:



**Notes:**

- 1) It is prohibited to drive inductive devices such as relays and motors.
- 2) The load current at the output terminal must meet the product specifications. If necessary, connect a current-limiting resistor in series.

If the external device requires a high/low-level input:



**Notes:**

1. Measure whether the TRIGGER pin of the controlled device carries voltage. If voltage is present, the device has an internal pull-up resistor and no external pull-up resistor is required. Note that the device's built-in voltage must not exceed the DM8700 maximum output control voltage of 28 V.
2. If the TRIGGER pin does not carry voltage, confirm the input voltage range of the controlled device. The supply voltage for the pull-up resistor must not exceed the maximum input voltage of the controlled

device and must be less than 28 V; otherwise, the controlled device and the code reader may be damaged.

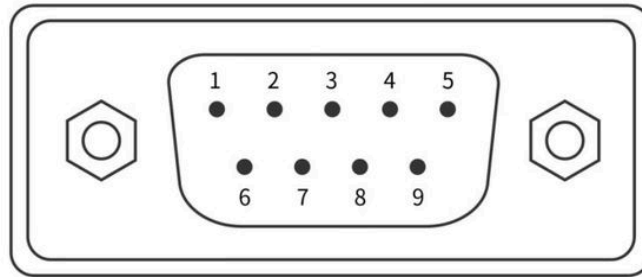
3. The resistor value is recommended to be calculated according to  $P = U^2/R$  to ensure that the power is lower than the rated power of the pull-up resistor; otherwise, the resistor may be damaged.

### 3.3 RS-232 Serial Port

The device supports RS-232 serial output.

#### 3.3.1 RS-232 Serial Port

The pin definitions of a commonly used 9-pin male RS-232 serial connector are shown below.



| Pin Number | Meaning | Function Description |
|------------|---------|----------------------|
| 2          | RX      | Receive data         |
| 3          | TX      | Send data            |
| 5          | GND     | Signal ground        |

Note: The above definitions are for a male connector. Pay attention when wiring.

## 4. Client Installation and Operation

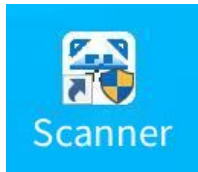
### 4.1 Client Software Download

Go to the Tipcode official website at <https://www.tipcode.com> and download the “tipcode-scanner” software installation package. Double-click the installation package to install the software.

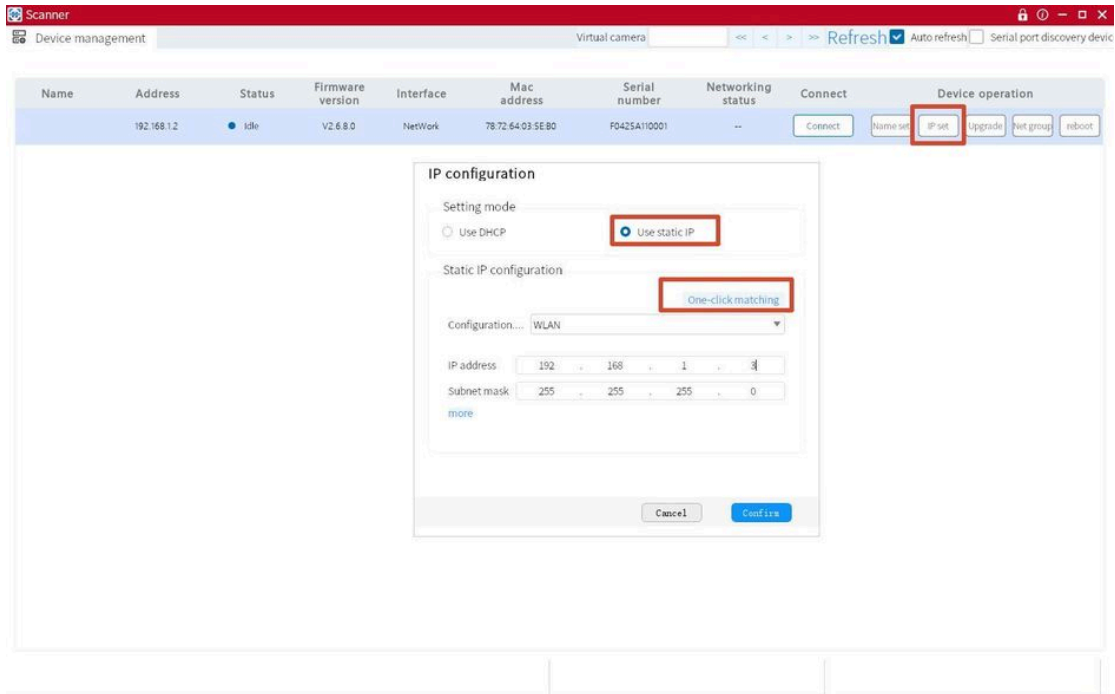


### 4.2 Software Connection

- On the PC desktop, click “TipcodeScanner”. The software must be opened as an administrator.



- The smart code reader and the PC running the configuration software must be on the same network segment to connect.
- Default IP address of the VS2000 series: 169.254.153.0; gateway setting: 255.255.255.0.
- DHCP or static IP addressing can be used to establish communication.



## 4.3 PC Network Configuration

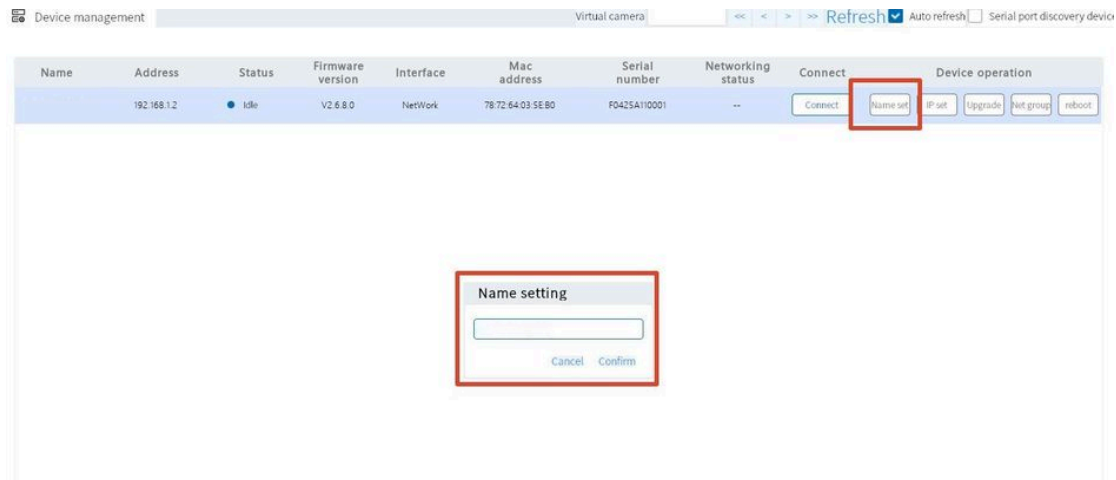
### 4.3.1 Change the PC IP Address

- 1) Using Windows 10 as an example, open Start Menu > Settings > Network & Internet > Ethernet > Change adapter options > Ethernet 3 > right-click Properties > Network > Internet Protocol Version 4 (TCP/IPv4). Change the IP address of the corresponding PC network adapter to 169.254.153.16 and set the gateway mask to 255.255.255.0.
- 2) Open the configuration software, select the corresponding PC, and click Connect to complete the connection.



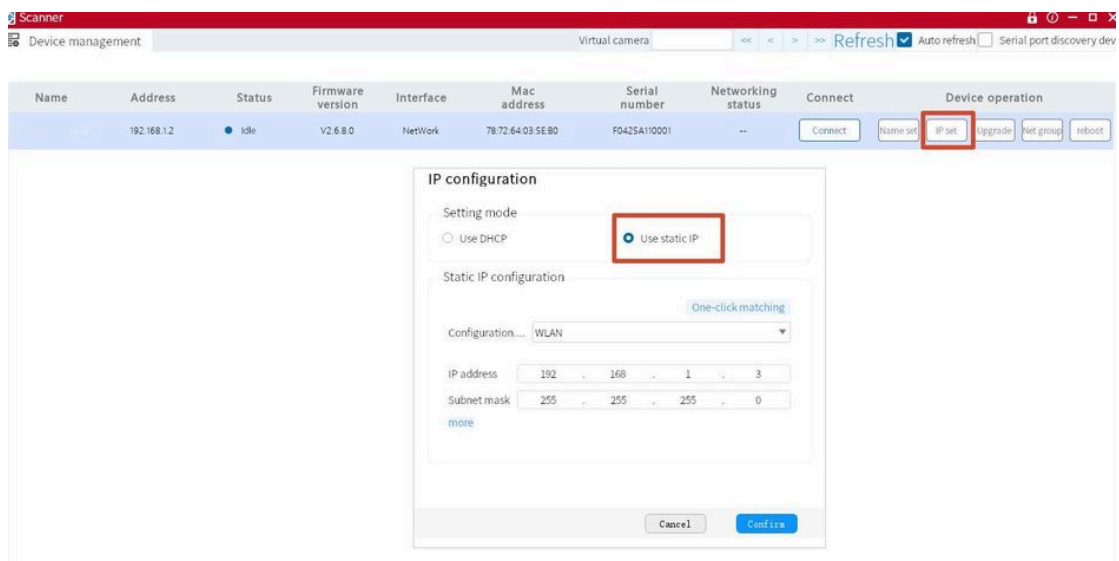
### 4.3.2 Change the Code Reader Name

Customize the code reader name as needed.



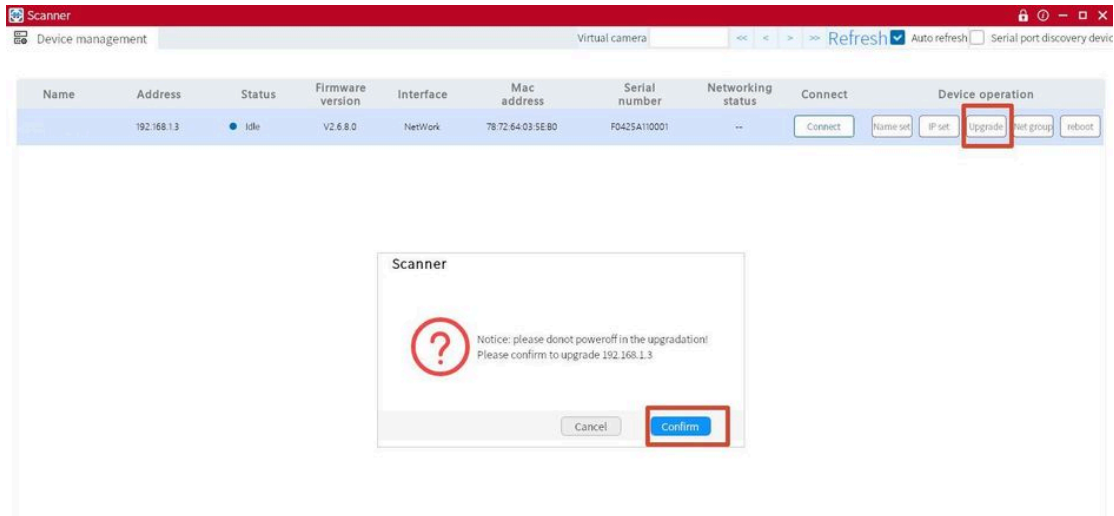
### 4.3.3 Change the Code Reader IP Address

Open the configuration software, select the corresponding PC network card, and after the code reader appears, click IP Set > Use Static IP > One-click Match > Confirm. Change the device IP address to an IP address in the same network segment as the PC.



### 4.4 Firmware Upgrade

Operation path: Device operation> Upgrade. Select the firmware file and click OK to update the firmware. Wait for the restart to complete.

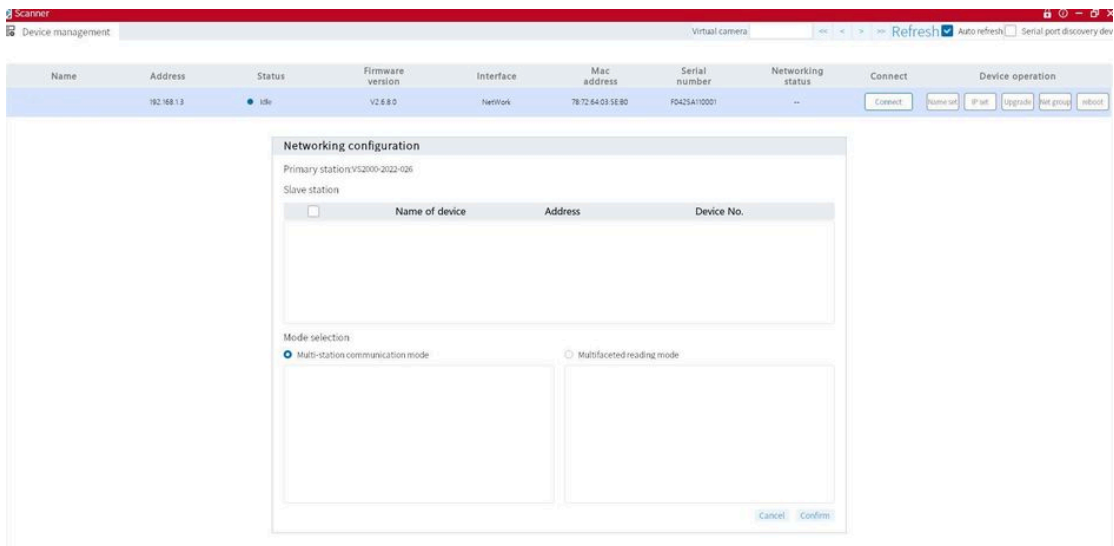


## 4.5 Network Configuration

Operation path: Device Management > Device Operation > Network Configuration > Select Add Specified Slave Device > Mode Selection.

Multi-station communication mode: A single code reader acts as the master station and connects to multiple slave code readers. The master only forwards slave data and does not perform data interaction.

Multi-sided reading mode: A single code reader acts as the master station and connects to multiple slave code readers. The master processes the slave data, summarizes it, and then transmits the combined data.



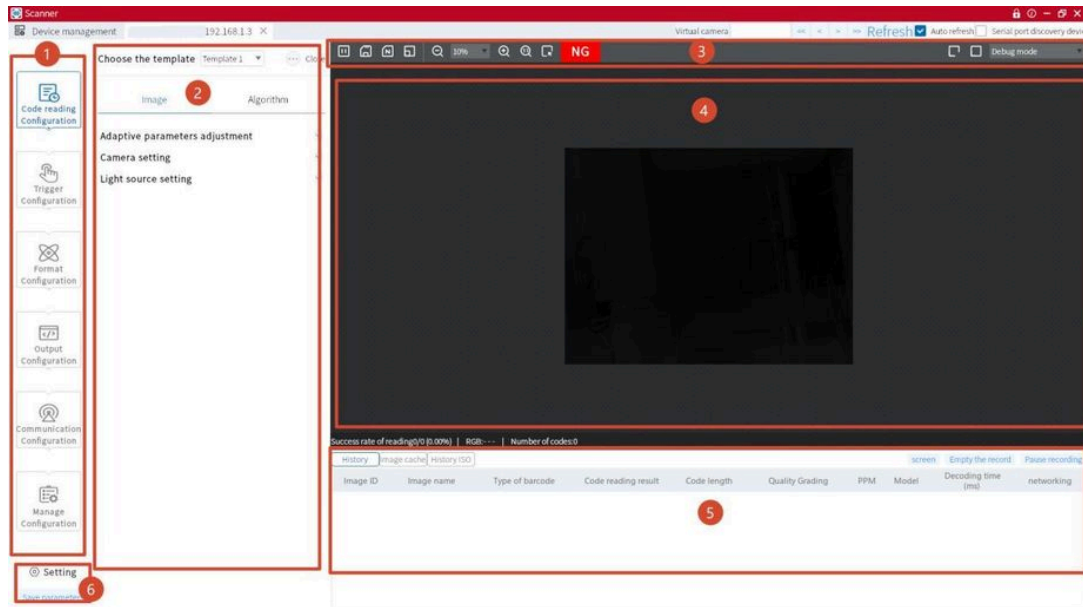
## 5. Function Introduction

### 5.1 Client Interface Introduction

The device can be operated through the client as follows:

When the device is reachable, select it in the client's Connect list and click to connect successfully.

After connecting the device, the main client interface is shown in the original figure. The functions of each module are described in the table below.



| No. | Name                      | Function Description                                                                                                                                                                    |
|-----|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Menu Bar                  | Used to set basic client functions.                                                                                                                                                     |
| 2   | Code Reader Configuration | Secondary menu of the menu bar used to set parameters for corresponding modules, including template selection, parameter settings, algorithm settings, and more.                        |
| 3   | Toolbar                   | Used to start/stop image acquisition. It also supports shortcuts such as image capture and saving, ROI cancellation, preview zoom in/out, software trigger, and running mode switching. |
| 4   | Preview Window            | Displays in real time the image currently acquired by the device, the algorithm reading result, and the effect of the drawn ROI window.                                                 |
| 5   | History                   | Displays in real time the barcode information currently read by the client.                                                                                                             |
| 6   | Basic Settings            | Used to change the device name, buzzer settings, and button settings; also used to count code reading information and view device logs.                                                 |

## 5.2 Code Reading Configuration

### 5.2.1 Template Selection

Template types support four templates, from “Template 1” to “Template 4”.

Use the drop-down list at the upper left of the Code Reader Configuration area to select the device template. After the relevant code reader parameters are configured, the running mode can be saved as a template.

When multiple templates are selected, template polling is entered. During the task time, reading is performed by polling the selected templates. If Use Last Successful Template is selected, the current task is decoded using the template that decoded successfully in the previous task. If it is not selected, the templates are polled from 1 to 4 in ascending order.

Multi-template serial image acquisition: When enabled, the current template acquires an image and completes decoding before entering the next template. When disabled, multiple templates acquire images in parallel and decode in sequence. This option is disabled by default.

Choose the template

Template 1

Turn on

☒ Template 1

☐ Template 2

☐ Template 3

☐ Template 4

☒ Use Last Success Template

☐ Multi template serial image retrieval

| Image                          | Algorithm                           |
|--------------------------------|-------------------------------------|
| Adaptive parameters adjustment | <input checked="" type="checkbox"/> |
| Camera setting                 | <input checked="" type="checkbox"/> |
| Light source setting           | <input checked="" type="checkbox"/> |

### 5.2.2 Image Acquisition

If the recognition result is poor, you can adjust Image Acquisition parameters in Code Reading Configuration, including manual adjustment of camera settings and light source settings such as exposure time, gain, focus, and light source parameters. You can also use adaptive adjustment, where the device intelligently adjusts camera and light source settings by itself.

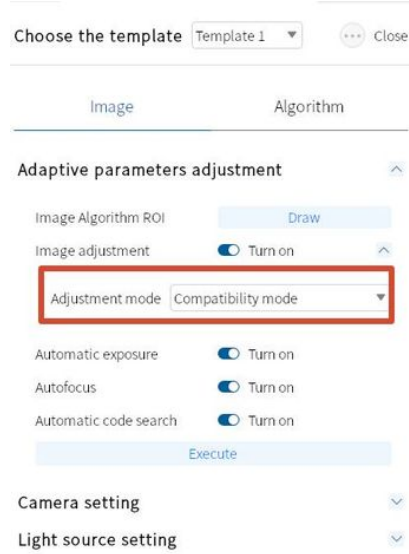
#### 5.2.2.1 Adaptive Parameter Adjustment

Adaptive parameter adjustment includes image algorithm ROI, image adjustment, light source adaptation mode, auto focus, and automatic code type search. Select the required tuning items and click Execute. The device automatically adjusts exposure, gain, light source, code type, and other parameters to achieve the best decoding effect, and automatically writes the adjusted parameters to each parameter item.

**Image algorithm ROI:** Click Draw to select the target region of interest for adjustment.

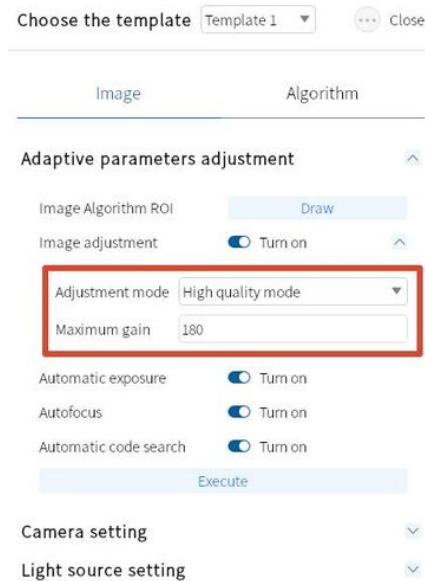
**Image adjustment mode:**

1. **Compatible mode:** Adjusts both gain and exposure time and provides optimal comprehensive imaging.



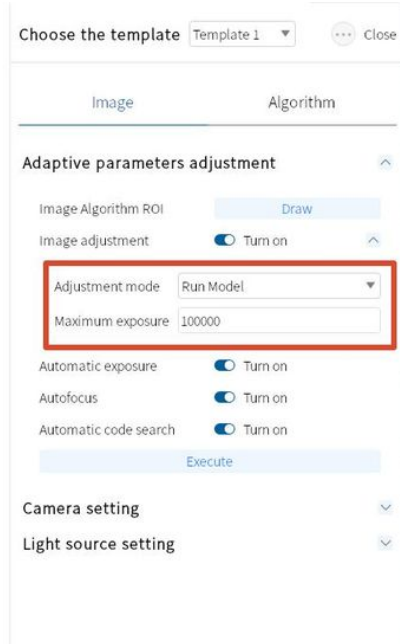
The screenshot shows the 'Image adjustment' settings window. At the top, there's a 'Choose the template' dropdown set to 'Template 1' and a 'Close' button. Below this are two tabs: 'Image' and 'Algorithm'. The 'Adaptive parameters adjustment' section is expanded, showing 'Image Algorithm ROI' with a 'Draw' button. 'Image adjustment' is turned on. The 'Adjustment mode' dropdown is set to 'Compatibility mode' and is highlighted with a red box. Below this, there are three toggle switches for 'Automatic exposure', 'Autofocus', and 'Automatic code search', all of which are turned on. An 'Execute' button is at the bottom of this section. Further down, there are expandable sections for 'Camera setting' and 'Light source setting'.

2. **High-quality mode:** Limits maximum gain and prioritizes exposure adjustment to ensure image quality.



The screenshot shows the 'Image adjustment' settings window with 'High quality mode' selected. The 'Adjustment mode' dropdown is set to 'High quality mode' and is highlighted with a red box. Below it, the 'Maximum gain' is set to '180'. The 'Automatic exposure', 'Autofocus', and 'Automatic code search' toggle switches are all turned on. An 'Execute' button is at the bottom of the adjustment section. The 'Camera setting' and 'Light source setting' sections are also visible at the bottom.

3. **Motion mode:** Limits exposure time and prioritizes gain adjustment to meet code reading requirements in high-speed motion scenarios.



Light source adaptation (optional): When enabled, light source status is included in the adjustment process.

Auto focus (optional): When enabled, auto focus is included in the adjustment process.

Automatic code type search (optional): When enabled, the device automatically determines the code type information in the current field of view and the parameters required by the decoding algorithm.

Adjustment procedure: Select the required parameters according to the situation > click Execute > perform adaptive parameter adjustment.

### 5.2.2.2 Camera Settings

- Auto AE: Four different exposure values can be set for sequential image acquisition exposure.
- Exposure Time: Controls the shutter opening time of the code reader and controls image brightness. A longer exposure time produces a brighter acquired image. It can be adjusted by dragging the slider or entering a number.
- Gain Coefficient: Controls image gain and image brightness. It can be adjusted by dragging the slider or entering a number.
- Note: The larger the exposure time, the lower the supported reading speed for moving objects. The larger the gain coefficient, the more image noise.
- Gamma Value: Gamma adjusts image contrast. It can be adjusted by dragging the slider or entering a number. The value range is 1 to 4.
- Focus Adjustment: Adjusts the focus value forward or backward. Users can adjust according to the actual preview image to achieve the best image effect.
- Mirror Flip: Includes horizontal flip, vertical flip, horizontal and vertical flip, and no flip.

Choose the template Template 1 ... Close

---

Image Algorithm

Adaptive parameters adjustment ▼

Camera setting ▲

Automatic AE Close ▼

Exposure time 1000

Gain coefficient 200

Gamma 1.8

Focus adjustment 0

☐ Focus value follows template switching

Light source setting ▼

### 5.2.2.3 Light Source Settings

The light source settings section can configure whether the light source is enabled, the aiming light, and other related parameters according to different models and application requirements.

Light Source: Controls the light source on/off state.

Positioning Light: Controls the aiming light on/off state.

Eye Protection Mode: Adjusts the flashing frequency or pulse mode.

Choose the template Template 1 ... Turn on

☒ Template 1 ☐ Template 2 ☐ Template 3

☐ Template 4

☒ Use Last Success Template

☐ Multi template serial image retrieval

---

Image Algorithm

Adaptive parameters adjustment ▼

Camera setting ▼

Light source setting ▲



Lighting Source ☑

Positioning lamp ☑

Eye protection mode ☐

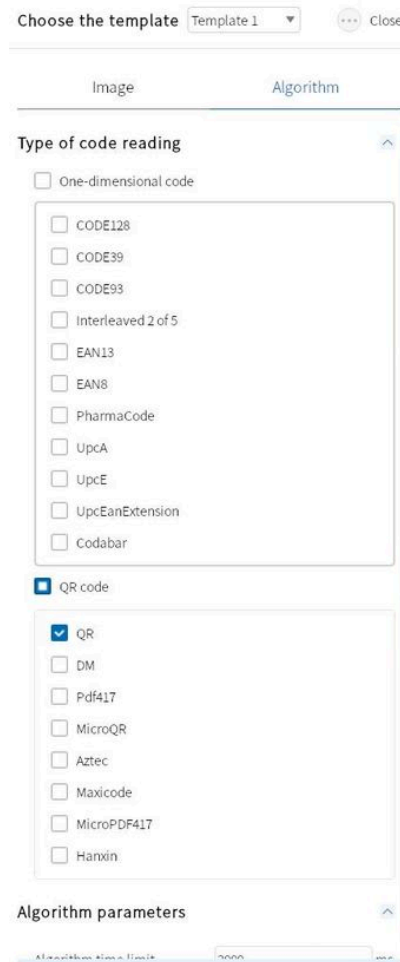
### 5.2.3 Algorithm Configuration

The device can set code reading algorithm parameters through the Algorithm Configuration module.

#### 5.2.3.1 Code Reading Type

The current code reader supports both one-dimensional codes and two-dimensional codes. Select the code types that the device needs to read; multiple selections are supported.

As shown in the original figure, the algorithm configuration interface displays the selected code types. The more code types selected, the longer the algorithm takes to process each image. Select only the required code types according to actual needs to achieve the best performance.



#### 5.2.3.2 Algorithm Parameters

These parameters are used for decoding one-dimensional and two-dimensional codes.

- Algorithm Timeout: Sets the algorithm timeout. If the algorithm operation time exceeds this value, image processing stops and the result is output.
- Image Preprocessing: Enables image preprocessing functions, including erosion, dilation, opening/closing operations, and other image processing tools.

- **Algorithm Type:** The parameter can be set to Normal mode or Expert mode. Expert mode is recommended for complex scenarios.

Choose the template Template 1 Close

---

Image

Algorithm

---

Type of code reading ▼

Algorithm parameters ▲

Algorithm time limit 2000 ms

Image Preprocess Turn

Algorithm type Expert Mode ▼

GS1 Close ▼

GS1 interception Turn on

UDI(C128) Close ▼

DMECC ECC200 ▼

1D/2D Barcode Configuration QR code ▼

Application Mode Expert Mode ▼

Distortion degree Close ▼

QRVersion Close ▼

Edge Type Compatibility Mode ▼

DM Type Compatibility Mode ▼

DMVersion\_1 Close ▼

2D Code Number 1

QR mode Auto ▼

algorithm ROI setting Turn on ▲

Draw ROI manually Draw

Add multiple ROI in a batch Draw

Clear all ROI Clear

ROI number offset 0

ROI Follow Template Close

- **GS1:** Used for GS1 format output. On: retains the parentheses in the barcode. Separator: customizable and used to set the barcode separator between DI and PI. Off (default): removes parentheses from the barcode.

GS1 Close ▼

GS1 interception Close ▼

UDI(C128) Open ▼

DMECC Separator ▼

- **GS1 Extraction:** The number in GS1 extraction represents the sequence of data segments divided by parentheses. Each option corresponds to extracting a data segment from the barcode from the starting position to the end of the specified parenthesis.

Algorithm type: Expert Mode

GS1: Close

GS1 interception: ☒ Turn on

Capture selection: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

- UDI (C128): Used for UDI format output. Combine: when DI and PI are assigned to two barcodes, enabling this option combines the barcodes for output. Separator: customizable barcode separator. Off (default): outputs them as two barcodes.

UDI(C128): Close

DMECC: Close

1D/2D Barcode Configuration: combination

Separator: Separator

Application Mode: Expert Mode

- DMECC: Selects different DM code versions

DMECC: ECC200

1D/2D Barcode Configuration: Auto

Application Mode: ECC000

Distortion degree: ECC050

QRVersion: ECC080

Edge Type: ECC100

DM Type: ECC140

Compatibility Mode: ECC200

### One-dimensional Code Parameters

- Running Mode: Selects the decoding method. Different modes have different algorithm processing time and results. Available parameters include Normal mode, High-speed mode, Expert mode, and Motion mode.

1D/2D Barcode Configuration: One-dimensional code

Application Mode: Normal Mode

Code39 check: Normal Mode

UPCA to EAN13: Fast Mode

1D Code Number: Expert Mode

Run Model: Run Model

- Code39 Check: When enabled, one check digit is added to the data.
- UPCA to EAN13: Converts a UPC-A barcode into an EAN-13 barcode.
- Number of 1D Codes: Limits the number of one-dimensional codes to be read.

Choose the template Template 1 ... Close

---

Image

Algorithm

---

Type of code reading ▼

Algorithm parameters ▲

Algorithm time limit

ms

Image Preprocess

☐ Turn

Algorithm type

Expert Mode ▼

GS1

Close ▼

GS1 interception

☒ Turn on

Capture selection

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

UDI(C128)

Close ▼

DMECC

ECC200 ▼

1D/2D Barcode Configuration

One-dimensional code ▼

Application Mode

Normal Mode ▼

Code39 check

Off ▼

UPCA to EAN13

▼

1D Code Number

algorithm ROI setting

☒ Turn on ▼

### Two-dimensional Code Parameters

- Running Mode: Selects the decoding method. Different modes have different algorithm processing time and results. Available parameters include Normal mode, High-speed mode, Expert mode, and Motion mode.

|                             |                      |
|-----------------------------|----------------------|
| 1D/2D Barcode Configuration | QR code ▼            |
| Application Mode            | Expert Mode ▼        |
| Distortion degree           | Normal Mode          |
| QRVersion                   | Fast Mode            |
| Edge Type                   | Expert Mode          |
| DM Type                     | Run Model            |
| DMVersion_1                 | Compatibility Mode ▼ |
| 2D Code Number              | Close ▼              |
| QR mode                     | 1                    |
|                             | Auto ▼               |

- Distortion Level: Determines whether the code is distorted. The severity of distortion is divided into Low, Medium, and High.
- QR Version: Selects the QR version. Accurate selection can reduce algorithm processing time. It is recommended to keep this disabled.
- Edge Type: Can be set to discrete, continuous, or compatible mode.
- DM Code Type: Distinguishes the type of DM code. Available parameters include square and rectangular.
- DM Version\_1: Selects the DM version. Accurate selection can reduce algorithm processing time. It is recommended to keep this disabled.
- Number of 2D Codes: Limits the number of two-dimensional codes to be read.
- QR Mode: Includes Auto, Mode 1, and Mode 2. Auto means that the code reader automatically determines the QR code type and selects the appropriate decoding method. Mode 1 corresponds to QR Code Model 1, and Mode 2 corresponds to QR Code Model 2.

Choose the template
Template 1
Close

Image
Algorithm

Type of code reading
Algorithm parameters

Algorithm time limit
2000
ms

Image Preprocess
Turn

Algorithm type
Expert Mode

GS1
Close

GS1 interception
Turn on

Capture selection
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

UDI(C128)
Close

DMECC
ECC200

1D/2D Barcode Configuration
QR code

Application Mode
Expert Mode

Distortion degree
Close

QRVersion
Close

Edge Type
Compatibility Mode

DM Type
Compatibility Mode

DMVersion\_1
Close

2D Code Number
1

QR mode
Auto

algorithm ROI setting
Turn on

Draw ROI manually
Draw

Add multiple ROI in a batch
Draw

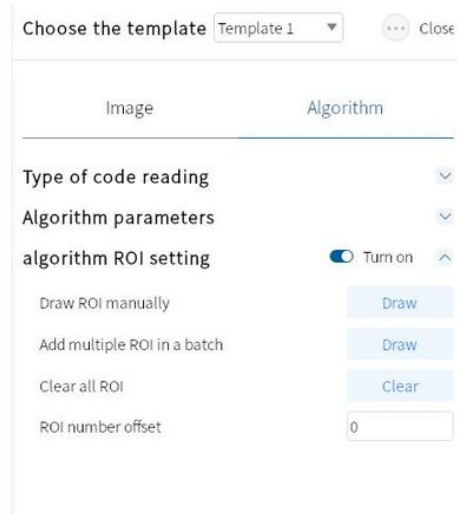
Clear all ROI
Clear

ROI number offset
0

ROI Follow Template
Close

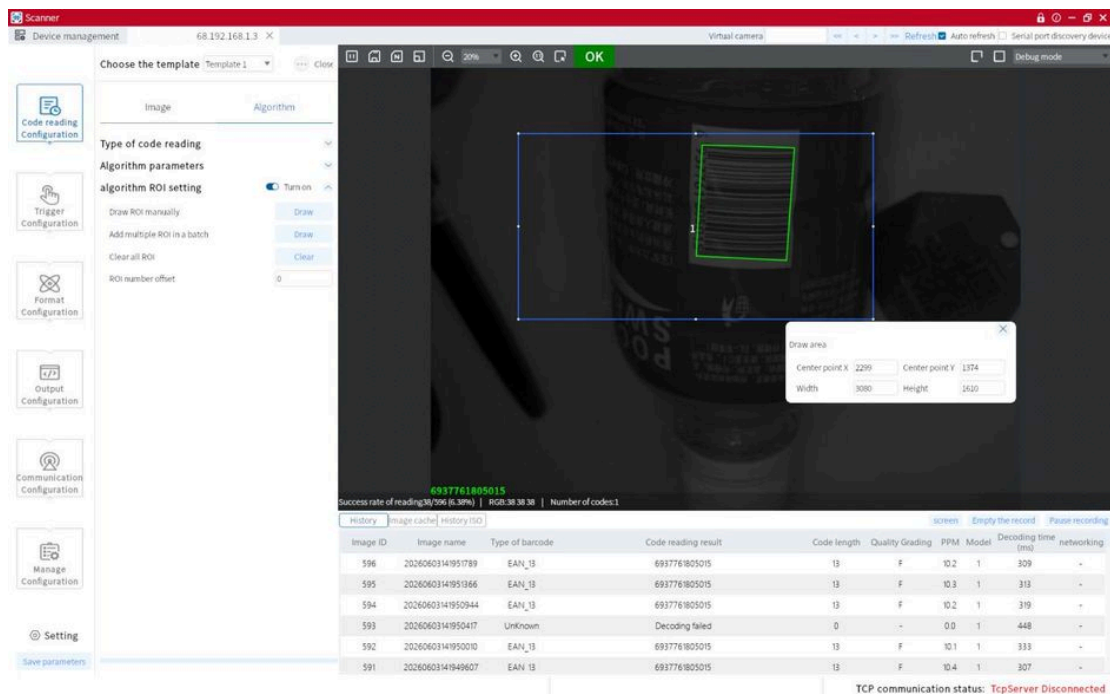
### 5.2.3.3 Decoding Algorithm ROI Settings

The algorithm ROI can perform algorithm recognition only on the region of interest selected on the device. Other areas are not processed by the algorithm, improving code reading efficiency. The device can set multiple algorithm ROI regions and output barcode results in ascending order of the ROI number where the barcode is located. The output rule is: 1, barcode; 2, barcode; 3, barcode; 4, barcode. If no barcode is recognized in an algorithm ROI region, the barcode information for that region is changed to the configured noread character. Currently, manual drawing and batch adding are supported for algorithm ROI drawing, and clearing all ROIs is also supported. ROI Number Offset allows the user to manually enter a number to set the starting value of the ROI number. ROI Follows Template automatically sets ROI positions and numbers according to the selected template.



Manual ROI drawing: Click Set to enter manual ROI setting mode. Drag to set the ROI size as needed. The ROI size can also be precisely set through center point X/Y, width, and height. The framed region is the algorithm region of interest.

1. Center X: X coordinate of the ROI frame center.
2. Center Y: Y coordinate of the ROI frame center.
3. Width: Number of pixels in the horizontal direction of the ROI.
4. Height: Number of pixels in the vertical direction of the ROI.

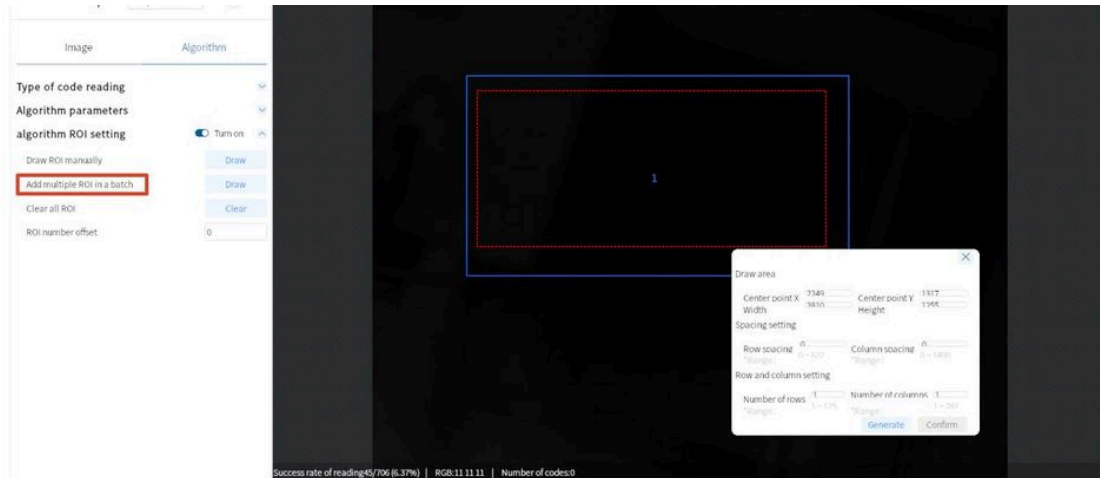


Batch Add ROI (checkerboard): Used to draw ROIs in batches.

- Drawing Region: Center X is the X coordinate of the batch setting area center; Center Y is the Y coordinate of the batch setting area center; Height is the number of pixels in the vertical direction

of the batch setting area; Width is the number of pixels in the horizontal direction of the batch setting area (default is the maximum pixel count).

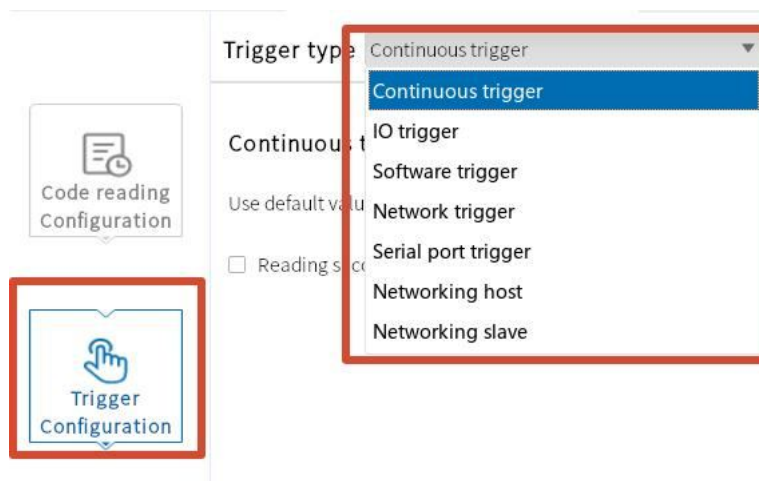
- Spacing Settings: Row spacing is the spacing between ROI rows; column spacing is the spacing between ROI columns.
- ROI Quantity (rows x columns): Sets the number of ROI rows and columns in batches. The maximum value is dynamically adjusted according to the drawing area size and the row/column spacing.
- Generate: Confirms the above settings.



- Clear All ROI: Clears all current ROIs.

## 5.3 Trigger Configuration

Trigger types include Continuous Trigger, I/O Trigger, Software Trigger, Network Trigger, Serial Trigger, Sensor Trigger, Networked Master, and Networked Slave.



### 5.3.1 Continuous Trigger

Continuous trigger means that the code reader continuously triggers image capture.

- Use Default Value: Indicates whether to use the system default continuous trigger parameters.
- Successful Reading Status Feedback (ms): After successful code reading, the light source is turned off according to the set time.

Trigger type
Continuous trigger

Continuous trigger

Use default values
No

☐ Reading success status feedback
700

Photo Settings

Image collection mode
Cache Mode

Maximum number of images
10

get image frequency
1 out of 1

End Settings

Multiple choices are allowed, and if any condition is met, the task  
If not selected, read a code to end the task

☐ Multiple Barcode termination Enable
1

☒ Timeout ended 9999

☒ The maximum number of images reached in cache mode has

Advanced Options

Please read the description carefully before enabling the following  
Please note that some options may delay the end of the task

☒ The task time is fixed to a timeout time

### 5.3.2 I/O Trigger

I/O trigger means that the code reader performs image capture and decoding after receiving a signal.

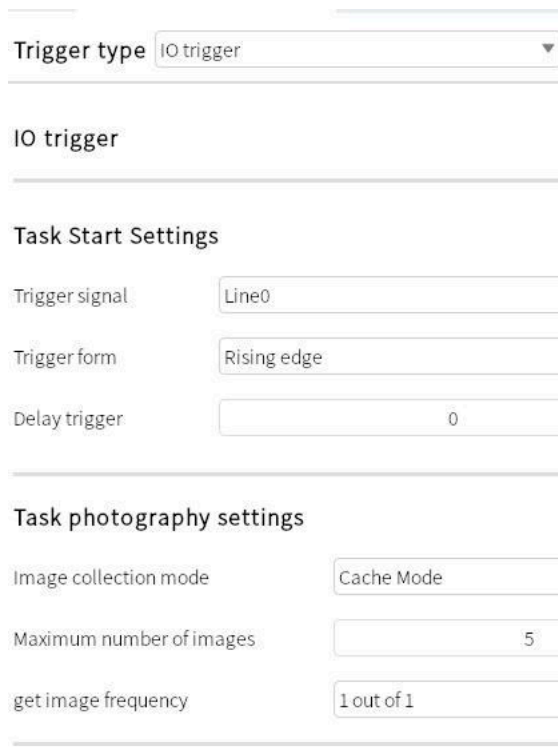
#### Task Start Settings

- Trigger Signal: On the task start settings page, trigger signals are divided into Line0 and Line1, corresponding to hardware trigger inputs IN0 and IN1.
- Trigger Form: On the task start settings page, trigger forms include Rising Edge and Falling Edge. Rising edge means that the code reader starts reading when it receives a rising-edge signal. Falling edge means that the code reader starts reading when it receives a falling-edge signal.
- Delayed Trigger: On the start trigger page, trigger delay means that after the trigger signal is received, code reading starts only after the set delay time. On the stop trigger page, trigger delay

means that after the stop trigger signal is received, code reading stops only after the set delay time. The default is 0 ms. The setting range is 0 ms to 9999 ms.

### Task Image Capture Settings

- Image Acquisition Mode: Includes cache mode and non-cache mode. Non-cache mode is a serial operating mode in which image acquisition and decoding are performed sequentially. Cache mode is a parallel operating mode in which image acquisition and decoding are performed in parallel, and is suitable for scenarios where moving barcode positions are not fixed.
- Maximum Number of Acquired Images (cache mode): Sets the images required for the cache. The value range is 1 to 40, and the range may vary by device.
- Image Selection Frequency (cache mode): Sets how many images are selected from the cached images for recognition.

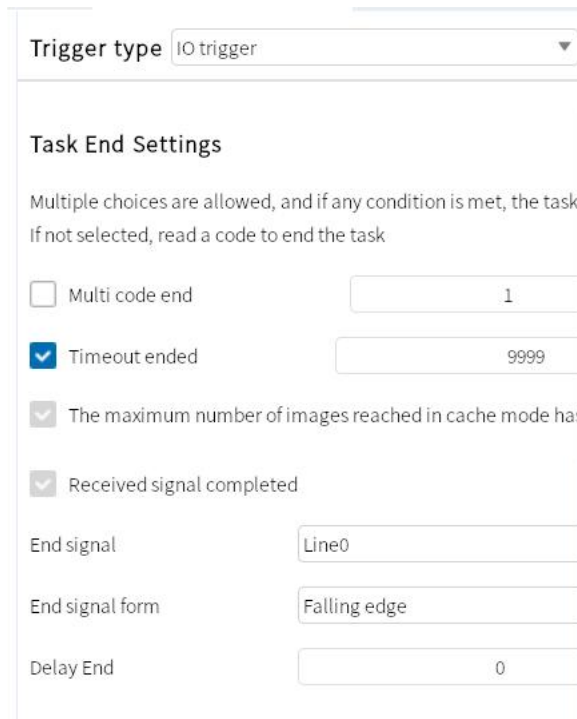


The screenshot shows a configuration window for 'Task Image Capture Settings'. At the top, 'Trigger type' is set to 'IO trigger'. Below this, the 'IO trigger' section is expanded. Under 'Task Start Settings', 'Trigger signal' is 'Line0', 'Trigger form' is 'Rising edge', and 'Delay trigger' is '0'. The 'Task photography settings' section shows 'Image collection mode' as 'Cache Mode', 'Maximum number of images' as '5', and 'get image frequency' as '1 out of 1'.

### Task End Settings

- Multi-code End: When enabled, the set number of barcodes is used as the end condition. If the number of read codes is not reached and task timeout is not enabled, the device remains in the reading state (excluding duplicate codes). When task timeout is enabled, the task exits according to the task timeout setting.
- Timeout End: Sets the maximum task time for a single trigger. After triggering starts, if the task is not closed when the timeout is reached, it is forcibly closed. The default is 9999. The setting range is 10 to 99999 ms, and it takes effect when enabled.

- End When Maximum Image Count in Cache Mode Is Reached: This item is linked with cache mode and cannot be modified. When cache mode is enabled, the task ends after the number of decoded images reaches the maximum image count.
- End upon Receiving Signal: Ends the task when an end task signal is received.
- End Signal: On the task end settings page, trigger signals are divided into Line0 and Line1, corresponding to hardware trigger inputs IN0 and IN1.
- End Signal Form: On the task end settings page, trigger forms include Rising Edge and Falling Edge. Rising edge means that the code reader stops reading when it receives a rising-edge signal. Falling edge means that the code reader stops reading when it receives a falling-edge signal.
- Delayed End: Sets the task end delay time. After triggering starts, when the task time limit is reached, the task is closed after the delay. The default is 0. The setting range is 0 to 99999 ms, and it takes effect when enabled.



The screenshot shows the 'Task End Settings' configuration window. At the top, 'Trigger type' is set to 'IO trigger'. Below this, a section titled 'Task End Settings' contains a note: 'Multiple choices are allowed, and if any condition is met, the task will end. If not selected, read a code to end the task'. There are four checkboxes: 'Multi code end' (unchecked, value 1), 'Timeout ended' (checked, value 9999), 'The maximum number of images reached in cache mode has' (checked), and 'Received signal completed' (checked). Below these are three input fields: 'End signal' set to 'Line0', 'End signal form' set to 'Falling edge', and 'Delay End' set to '0'.

### Advanced Options

- I/O Debounce Time: Increases debounce time when the signal is unstable to avoid false triggering. The setting range is 0 to 300000 ms.
- Cache One I/O Trigger Signal: If a trigger signal arrives before the previous task ends, one trigger signal can be cached. The next task is triggered immediately after the previous task ends.
- Task Time Fixed to Timeout Time: Commonly used for output at a fixed time. When any end condition is met, image capture stops, but the task ends only when the task time reaches the timeout time.
- Decode Maximum Number of Cached Images: Valid only in cache mode. Even if the end condition is met, the task does not end until the maximum number of cached images has been decoded.

- Stop Immediately upon Receiving End Signal: Valid when cache mode and end signal are both enabled. When the end signal is received, decoding of remaining cached images is abandoned and the task ends immediately.
- Continuous Reading During Task: The task ends only on timeout, reaching the maximum image count, or receiving the end signal. If unified result sending is not enabled, results are output after each image is decoded.

Trigger type

IO trigger

☐ Multi code end

1

☒ Timeout ended

9999

☒ The maximum number of images reached in cache mode has

☒ Received signal completed

End signal

Line0

End signal form

Falling edge

Delay End

0

Advanced Options

Please read the description carefully before enabling the following  
Please note that some options may delay the end of the task

IO anti shake time

2000

☐ IO trigger signal cache one

☐ The task time is fixed to a timeout time

☐ Decoded maximum number of cached images

☒ Stop immediately upon receiving the end signal

☐ Continuous code reading during the mission period

### 5.3.3 Software Trigger

Clicking Software Trigger with the mouse triggers the code reader to capture an image. Triggering means that the code reader performs image capture and decoding after receiving a signal.

Trigger type Software trigger

Software trigger

### 5.3.4 Network Trigger

Network trigger means that the code reader performs image capture and decoding after receiving a TCP trigger command signal.

- Start Trigger and End Trigger: Used to set the TCP start trigger and end trigger parameters.
- Trigger Signal: Sets the TCP command used for start trigger and end trigger.
- Result Trigger Enable: When enabled, the code reader transmits recognition results only after receiving the trigger signal sent by the host computer.
- Note: For other parameters, refer to the I/O trigger settings.

Trigger type Network trigger

Network trigger

Task Start Settings

Trigger signal start

Trigger starts 0 ms

Photo Settings

Image collection mode Cache Mode

Maximum number of images 10

get image frequency 1 out of 1

Trigger ends

Multiple choices are allowed, and if any condition is met, the task will end. If not selected, read a code to end the task.

☐ Multi code end 1 Codes

☒ Timeout ended 9999 ms

☐ The maximum number of images reached in cache mode has ended

Received signal completed

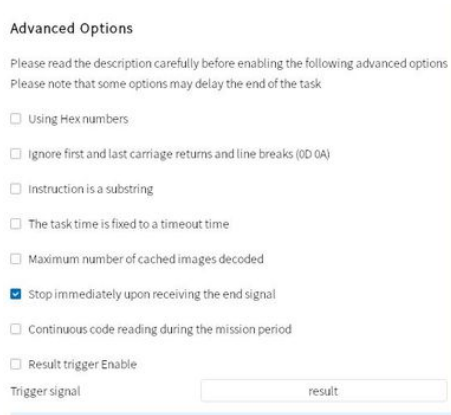
End signal stop

Delay ends 0 ms

### Advanced options:

- Use Hexadecimal: When enabled, the start/end trigger signal character format is set for hexadecimal output.
- Ignore Leading/Trailing CR LF (0D 0A): Ignores carriage return and line feed characters before and after the trigger string during matching.
- Command Is a Substring: Triggers as long as the trigger string is a substring of the input string.
- Task Time Fixed to Timeout Time: Valid only when timeout end is enabled. When any end condition is met, image capture stops, but the task ends only when the task time reaches the timeout time. This is commonly used for output at a fixed time.

- Decode Maximum Number of Cached Images: Valid only in cache mode. Even if the end condition is met, the task does not end until the maximum number of cached images has been decoded.
- Stop Immediately upon Receiving End Signal: Valid when cache mode and end signal are both enabled. When the end signal is received, decoding of remaining cached images is abandoned and the task ends immediately.
- Continuous Reading During Task: The task ends only on timeout, reaching the maximum image count, or receiving the end signal. If unified result sending is not enabled, results are output after each image is decoded.
- End Trigger Enable: Results are output only after the trigger signal is received.
- Trigger Signal: Sets the TCP command used for end triggering.



Advanced Options

Please read the description carefully before enabling the following advanced options  
Please note that some options may delay the end of the task

- ☐ Using Hex numbers
- ☐ Ignore first and last carriage returns and line breaks (0D 0A)
- ☐ Instruction is a substring
- ☐ The task time is fixed to a timeout time
- ☐ Maximum number of cached images decoded
- ☒ Stop immediately upon receiving the end signal
- ☐ Continuous code reading during the mission period
- ☐ Result trigger Enable

Trigger signal

### 5.3.5 Serial Trigger

Serial trigger means that the code reader performs image capture and decoding after receiving a serial trigger command signal.

Note: For other parameters, refer to the I/O trigger settings.

Trigger type
Serial port trigger

Serial port trigger

Task Start Settings

Trigger signal
start

Trigger starts
0

Task photography settings

Image collection mode
Cache Mode

Maximum number of images
5

get image frequency
1 out of 1

Task End Settings

Multiple choices are allowed, and if any condition is met, the task  
If not selected, read a code to end the task

☐ Multi code end
1

☒ Timeout ended
9999

☒ The maximum number of images reached in cache mode has

Received signal completed

End signal
stop

Delay ends
0

Advanced Options

Please read the description carefully before enabling the followin  
Please note that some options may delay the end of the task

☐ Using Hex numbers

☐ The task time is fixed to a timeout time

☐ Maximum number of cached images decoded

☒ Stop immediately upon receiving the end signal

☐ Continuous code reading during the mission period

### 5.3.6 Induction Trigger

Sensor trigger means that the code reader automatically triggers one task when it detects an object.

- Trigger Sensitivity: In task start settings, trigger sensitivity can be set to Low, Medium, or High.
- Sensing Interval: After the previous task ends, the device waits for the set interval before starting the next sensing detection.

*Note: For other parameters, refer to I/O trigger or network trigger settings.*

Trigger type Induction trigger

---

Induction trigger

---

Task Start Settings

Trigger sensitivity: centre

---

Task End Settings

Multiple choices are allowed, and if any condition is met, the task will end  
If not selected, read a code to end the task

☐ Multi code end 1 Codes

☒ Induction timeout: 2000 ms

---

Advanced Options

Please read the description carefully before enabling the following advanced options

Induction interval time: 200 ms

### 5.3.7 Networked Master

The parameters are the same as those in single-device trigger mode. Refer to pages 42 to 50 of the original manual.

### 5.3.8 Networked Slave

The parameters are the same as those in single-device trigger mode. Refer to pages 42 to 50 of the original manual.

## 5.4 Format Configuration

### 5.4.1 Format Configuration

Format configuration includes four sections: Data Filtering, Data Processing, Advanced Functions, and Host Networking Data Processing. It can be used to set device filtering rules and output data.

Configuration of format Configuration of format

---

Data filtering ▼

Data processing ▼

Advanced features ▼

Host networking data processing ▼

#### 1. Data Filtering

Data filtering applies configured rules to barcodes read by the device.

- Duplicate Time Filtering: When enabled, duplicate codes within the set time are not output. Value range: 30 to 9999999 ms. Example: If the value is set to 500 ms and the code content is 123452, then if it is read multiple times within 500 ms, the result is output only once.
- Duplicate Count Filtering: When enabled, if the same content is read more than the set number of times, it is not output. Value range: 1 to 99999. Example: If the value is set to 3, when the code content is 123452, the output count of 123452 cannot exceed 3.
- Duplicate Barcode Filtering: When enabled, if the read content is the same as the previous content, it is not output. Note: When single-code separate filtering is not enabled, duplicate barcode filtering takes effect only when the previous task and the current task have exactly the same content. Single-code Separate Filtering applies to time, count, and barcode filtering. When enabled, only barcodes repeated from the previous task are filtered, and non-repeated parts are output.
- Duplicate Barcode Merge: When enabled, identical content is merged into one result for output.
- Ignore NG in Filtering: When enabled, filtering does not consider NG conditions. This is used together with duplicate count/time/barcode filtering.
- Filter Including Subsets: When enabled, if there is an intersection of subset results between the previous result and the next result, the two results are considered the same. Example: Result A: 12345 and result B: 234 are considered the same and need to be filtered.
- Center Point Filtering: When enabled, only the barcode closest to the image center point is output.
- Angle Filtering: When enabled, only barcodes within the specified angle range are output.
- Barcode Quantity Filtering: When enabled, output occurs only when the barcode quantity matches the set value. Range: 1 to 200.
- Character/Digit Offset: Moves the decoding result left by the set number of digits. Range: 1 to 99. Example: Code 1232334 with the value set to 3 outputs 2334.
- Output by Code Type: Allows independent selection and definition of different code types, character offsets, specified single-code length, and regular expressions. Example: For code 54321, if specified single-code length selects extraction from the head and the value is 2, the output is 4. If extraction from the tail is selected and the value is 2, the output is 2.

#### **Additional filtering items:**

- Barcode Length Limit: When enabled, only codes within the limited range are output.
- Block Specified Characters: Enter specified characters to be blocked; the system automatically filters or deletes them so they are not sent or displayed.
- Block Special Characters: Blocks ASCII control characters 0x00 to 0x1F, while retaining line feed (0x0A) and carriage return (0x0D).
- Block Prefix: When enabled, codes whose decoding result starts with the set value are blocked. Multiple prefixes can be configured.
- Specified Prefix: When enabled, only codes with the specified prefix are output. Multiple prefixes can be configured.

- Specified Suffix: When enabled, only codes with the specified suffix are output. Multiple suffixes can be configured.
- Must Contain: When enabled, codes containing the set content are output. Multiple required strings can be configured.
- Must Not Contain: When enabled, codes that do not contain the set content are output. Multiple excluded strings can be configured.
- Character Requirement: All digits, letters only, or digits or letters.
- Barcode Verification: Enter target character information to verify whether the above filtering conditions are satisfied. If no input is provided, OK/NG is not displayed. OK is displayed when the filtering conditions are met, and NG is displayed when they are not met.

Configuration of format Configuration of format

Data filtering

Close Filtering of repeated time

Filter time 30 ms

Close Single code filtering separately

Close Filtering of repeated barcodes

Filter quantity 1 Items

Close Duplicate barcode filtering

Close Duplicate barcode merging

Close Filter ignore NG

Close Filter containing subsets

Close Center point filtering

Close Angle filtering

0 360

Close Barcode Filtered by Number

1 200

Close Barcode level filtering

☐ One-dimensional code
 ☐ QR code

Close Character numeric offset

1

Close Output according to code system

Code system selection Code128

☐ character offset 0
 

Single code specified length Close

☐ regular expression

Decoding content processing

Close Barcode length limit

Block specified characters Multiple conditions are s...

Close Block special characters

Turn on Block the beginning

Multiple conditions are separated by ";"

Close Specify the beginning

Close Specify the end

Close Must contain

Close Cannot contain

Close Character requirement

Barcode verification

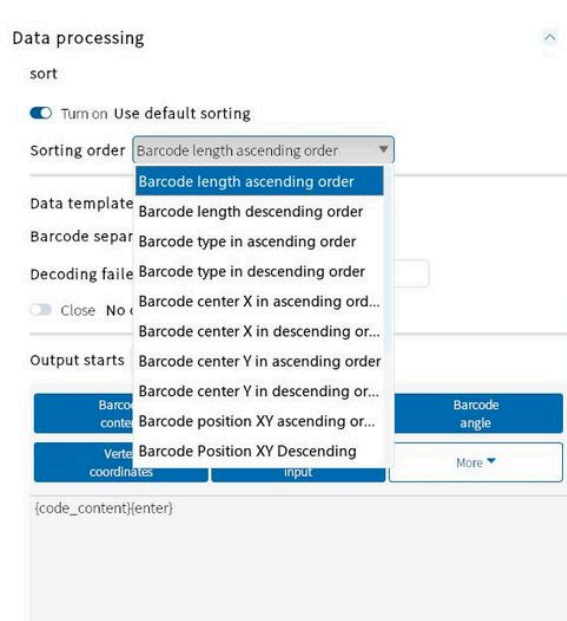
Data processing

Advanced features

## 2. Data Processing

The data processing section configures barcode output results. Specific parameters vary depending on the selected communication protocol.

- **Sorting Method:** Sorting method for code output results. Multiple sorting rules are supported:
  - Barcode length ascending: Sorts from shortest to longest according to barcode content length.
  - Barcode length descending: Sorts from longest to shortest according to barcode content length.
  - Barcode type ascending: One-dimensional codes: Code39, Code93, Code128, ITF25, EAN; two-dimensional codes: QR/DM.
  - Barcode type descending: Two-dimensional codes: DM/QR; one-dimensional codes: EAN, ITF25, Code128, Code93, Code39.
  - ROI ascending: Sorts by configured ROI number from small to large.
  - ROI descending: Sorts by configured ROI number from large to small.
  - Barcode center X ascending/descending: Sorts by barcode center X position from small to large; descending is the opposite.
  - Barcode center Y ascending/descending: Sorts by barcode center Y position from small to large; descending is the opposite.
  - Barcode position XY ascending/descending: Sorts by X from small to large and Y from small to large; descending is the opposite.
  - Sort by specified content: Sorts according to a field or character content specified by the user.
  - Use specified content as the first character for sorting: Extracts specified content and uses it as the first character for sorting.



**Data Template:** Used to configure the barcode result output of the code reader.

- **Barcode Separator:** Used to separate multiple codes. The default is semicolon (;). Available separators include semicolon (;), comma (,), slash (/), backslash (\), underscore (\_), hyphen (-), carriage return (, carriage return + line feed (, and "None". Custom separators are supported.

- Decode Failure Output Character: Character output when task decoding fails; customizable.
- ROI No-read Padding: Regions in which no code is read are automatically padded with the failure character.
- Output Start/End: Content at the start/end of output data. Specific content can be set according to actual needs.
- Output Content Configuration: Includes barcode content, barcode type, barcode angle, vertex coordinates, text input, ROI number, PPM, time, barcode quality, carriage return + line feed, carriage return, line feed, hexadecimal input, barcode quantity, and more.

Configuration of format
Configuration of format

Data filtering
Data processing

sort

Turn on Use default sorting

Sorting order Barcode length ascending order

Data template

Barcode separator

Decoding failed to output characters NG

Close No code displayed in ROI

Output starts

|                           |                       |                     |
|---------------------------|-----------------------|---------------------|
| Barcode content           | Barcode type          | Barcode angle       |
| Vertex coordinates        | Text input            | ROI No.             |
| PPM                       | Time                  | Barcode quality     |
| New line                  | Enter                 | Wrap                |
| Hexadecimal input         | Barcode number        | Code length         |
| Central coordinate        | Center coordinate X   | Center coordinate Y |
| Decoding time consumption | Task time consumption | Name of device      |

Collapse

```
{code_content}{enter}
```

Qualified

Output ends

Advanced features

### 3. Advanced Functions

- UnicodeToUTF8: Converts decoding results in Unicode format to UTF-8 format.
- UTF8ToASCII: Converts decoding results in UTF-8 format to ASCII format.
- GBKToUTF8: Converts decoding results in GBK format to UTF-8 format.

- Hex Replace Special Characters: Replaces invisible characters in the ASCII table within the decoding result with the corresponding hexadecimal values.
- Output NG When NG Has Results: When enabled, partial barcodes are output even when the read quantity does not meet the total reading quantity set in the trigger settings.
- Treat NG with Results as OK: The overall trigger task result is NG, but if the task has decoding results, the final output is OK.
- Output I/O When Failure Output Is Empty: If the above decode failure output character is empty, I/O output is still performed when the task fails.
- Output Results One by One: If there are multiple decoding results, each result is output one by one according to the set time. Range: 0 to 9999 ms.
- Specified Single-code Length: Decoding results are output by intercepting the specified length according to the setting. Options include extraction from the head, extraction from the tail, and off.
- Output Specified Length: When enabled, barcode characters are intercepted from the head or tail according to the set value and output.
- Whether Multi-code Enable Is an End Condition: Determines whether the multi-code condition in the trigger task is used as the task end condition for the current trigger task.
- OK Result Send Delay: When the task result is OK, the external result is sent after the set delay. Range: 0 to 9999 ms.
- NG Result Send Delay: When the task result is NG, the external result is sent after the set delay. Range: 0 to 9999 ms.

Configuration of format Configuration of format ▼

---

Data filtering ▼

Data processing ▼

Advanced features ▲

☒ Close UnicodeToUTF8

☒ Close UTF8ToASCII

☒ Close GBKToUTF8

☒ Close Hex replaces special characters

☒ Close NG has results output NG

☒ Close NG has a result that is OK

☒ Close Failed output is empty output IO

☒ Close Output results one by one  ms

Single code specified length Close ▼ X; X-x; X multi...

Output Length Close ▼

Does the multi code enable end condition Ye ▼

OK result sending delay  ms

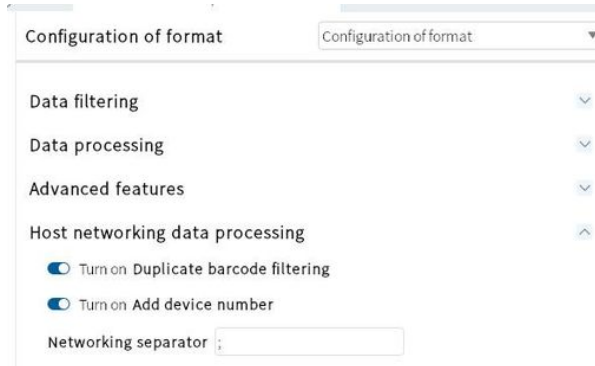
NG result sending delay  ms

---

Host networking data processing ▼

#### 4. Host Networking Data Processing

- Duplicate Barcode Filtering: After the networked master integrates all master/slave results, duplicate results are filtered and discarded.
- Add Device Number: Adds a device number to each result in the externally sent networking result to indicate which device produced the result.
- Networking Separator: After the networked master integrates all master/slave results, the externally sent results are separated according to the separator configured for the device.

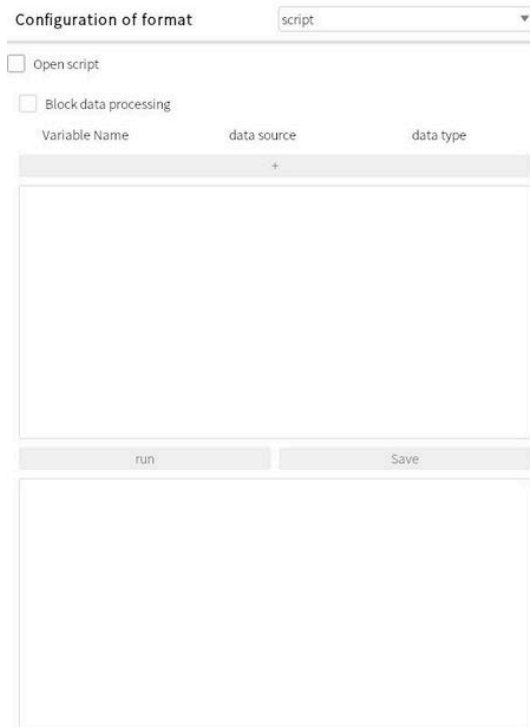


The screenshot shows the 'Configuration of format' dialog box with the 'Host networking data processing' section expanded. It contains three toggle switches: 'Turn on Duplicate barcode filtering' (checked), 'Turn on Add device number' (checked), and a 'Networking separator' text input field.

| Configuration of format             | Configuration of format |
|-------------------------------------|-------------------------|
| Data filtering                      | ▼                       |
| Data processing                     | ▼                       |
| Advanced features                   | ▼                       |
| Host networking data processing     | ▲                       |
| Turn on Duplicate barcode filtering |                         |
| Turn on Add device number           |                         |
| Networking separator                |                         |

#### 5.4.2 Script

Format Configuration (Script): This function is used to customize processing of code reading results. The data acquired by the system is recombined and output by means of a script.



The screenshot shows the 'Configuration of format' dialog box with the 'Script' section selected. It includes checkboxes for 'Open script' and 'Block data processing'. Below these is a table with columns 'Variable Name', 'data source', and 'data type'. A large text area for the script is at the bottom, with 'run' and 'Save' buttons.

| Configuration of format                        | script      |           |
|------------------------------------------------|-------------|-----------|
| <input type="checkbox"/> Open script           |             |           |
| <input type="checkbox"/> Block data processing |             |           |
| Variable Name                                  | data source | data type |
| +                                              |             |           |
| [Script Content Area]                          |             |           |
| run Save                                       |             |           |

## 5.5 Output Configuration

Output settings can control three different output groups. **OUTLINE0** and **OUTLINE1** correspond to hardware trigger outputs **OUT0** and **OUT1** respectively.

- Code Reading Status: OUTLINE0 and OUTLINE1 can select three states: Code Reading Success, Code Reading Failure, and Exception. Code Reading Success means a signal is output after successful reading. Code Reading Failure means a signal is output after reading fails. Exception means a signal is output when device self-check is abnormal.
- Output Inversion: If the device needs to output the opposite signal, enable output inversion.
- Received IN Signal: When the code reader detects a signal change on an input port (IN port), it triggers the corresponding output signal. Four signal changes are available: IN0 rising edge, IN0 falling edge, IN1 rising edge, and IN1 falling edge.
- Heartbeat Timeout: Outputs an alarm signal when network disconnection, PLC disconnection, device communication abnormality, or similar conditions occur.
- Trigger String: Custom string. When the device receives or recognizes the specified string, it triggers the corresponding action.
- Output Duration: Duration of the output signal. Time range: 0 to 999999999 ms. Empty input means infinite duration.
- Reset Option: Sets under what condition the current output signal is turned off. The setting content is the same as above.

Configuration of output

**OUTLINE0** Output reverse ☐ Turn on

☒ OK ☐ NG ☐ Exception  
☐ Received IN signal Rising edge of IN0  
☐ Heartbeat Timeout

Trigger Character: outline0

Output duration: 1000 ms

Reset options:

☐ OK ☐ NG ☐ Exception  
☐ Received IN signal IN0 falling edge  
☐ Heartbeat Timeout

Trigger string: outline0\_rst

**OUTLINE1** Output reverse ☐ Turn on

☐ OK ☒ NG ☐ Exception  
☐ Received IN signal Rising edge of IN0  
☐ Heartbeat Timeout

Trigger Character: outline1

Output duration: 1000 ms

Reset options:

☐ OK ☐ NG ☐ Exception  
☐ Received IN signal IN0 falling edge  
☐ Heartbeat Timeout

Trigger string: outline1\_rst

**OUTLINE2** Output reverse ☐ Turn on

☐ OK ☐ NG ☒ Exception  
☐ Received IN signal Rising edge of IN0  
☐ Heartbeat Timeout

Trigger Character: outline2

Output duration: 1000 ms

Reset options:

☐ OK ☐ NG ☐ Exception  
☐ Received IN signal IN0 falling edge  
☐ Heartbeat Timeout

Trigger string: outline2\_rst

**Trigger character reception timeout** ☐ Turn on

timeout: 0 ms

☐ OUT0 ☐ OUT1 ☐ OUT2

**IO\_Out trigger source** ☐ Turn on

Trigger Source Selection: Tcp server

IP address: 192.168.1.3

Subnet mask: 255.255.255.0

TCP port: 10000

☐ heartbeat  
 Heartbeat Timeout: 3000  
 Heartbeat Identifier: online

- **Trigger Character Receive Timeout:** The maximum time that the device waits for a trigger string. If the complete trigger string is not received within this time, the system determines that triggering failed or communication is abnormal. OUT0 or OUT1 can be selected as the I/O signal.
- **IO\_OUT Trigger Source:** The device supports three trigger sources: TCP Client, TCP Server, and Serial.

IO\_ Out trigger source

Close

Trigger Source Selection

Tcp server

IP address

192.168.1.3

Subnet mask

255.255.255.0

TCP port

16000

☐ heartbeat

Heartbeat Timeout:

2000

Heartbeat identifier:

online

IO\_ Out trigger source

Close

Trigger Source Selection

Tcp client

Server IP

169.254.153.100

TCP port

6000

☒ Ping function enabled

☐ heartbeat

Sending interval (ms)

1000

Timeout (ms)

2000

Heartbeat identifier:

online

IO\_ Out trigger source

Close

Trigger Source Selection

Serial

Baud rate

9600

Parity check

None

Data bit

8

Stop bit

1

## 5.6 Communication Configuration

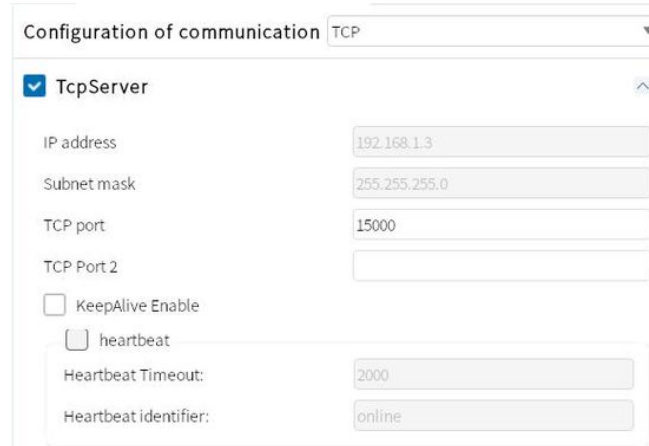
The **Communication Configuration** section includes TCP and serial port settings and is used to select the communication protocol required for data transmission. The available communication protocols are related to the device running mode.

### 5.6.1 Using the TCP Server Protocol

When TCP Server is selected as the communication method, the TCP port number can be configured.

- IP Address (fixed): Current network IP address of the device.
- Subnet Mask (fixed): Network address division.
- TCP Port: TCP communication port number.
- TCP Port 2: Backup or second communication port.
- KeepAlive Enable: Prevents connection disconnection caused by long periods without communication.
- Heartbeat: Application-layer connection detection mechanism.

- Heartbeat Timeout: If no heartbeat signal is received within the set time, the system considers the connection disconnected.
- Heartbeat Identifier Character: Heartbeat data content. Example: The client needs to periodically send online; after the device receives it, the connection is considered normal.



Configuration of communication TCP

☒ TcpServer

IP address 192.168.1.3

Subnet mask 255.255.255.0

TCP port 15000

TCP Port 2

☐ KeepAlive Enable

☐ heartbeat

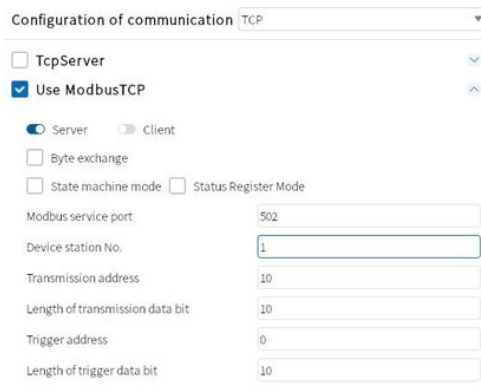
Heartbeat Timeout: 2000

Heartbeat identifier: online

### 5.6.2 Using the Modbus TCP Protocol

When Modbus TCP is selected, Modbus server IP, Modbus server port, and other parameters must be configured.

- Modbus Type: Select server or client communication mode according to requirements.
- Byte Swap: Swaps high and low bytes as required.
- Modbus Server IP: Appears when Client mode is selected. IP address of the connected device.
- Modbus Server Port: Port number of the connected device.
- Device Station Number: Station number of the connected device.
- Transmission Address: Address corresponding to PLC data transmission.
- Transmission Data Bit Length: Length of data bytes.
- Trigger Address: Address required for the PLC to trigger the camera.
- Trigger Data Bit Length: Length of data bits required for triggering.



Configuration of communication TCP

☐ TcpServer

☒ Use ModbusTCP

☒ Server ☐ Client

☐ Byte exchange

☐ State machine mode ☐ Status Register Mode

Modbus service port 502

Device station No. 1

Transmission address 10

Length of transmission data bit 10

Trigger address 0

Length of trigger data bit 10

Configuration of communication TCP

☐ TcpServer  
☒ Use ModbusTCP

☐ Server ☒ Client

☐ Byte exchange  
☐ State machine mode ☐ Status Register Mode

Modbus service IP:   
 Modbus service port:   
 Device station No.:   
 Transmission address:   
 Length of transmission data bit:   
 Trigger address:   
 Length of trigger data bit:

The PLC controls the device and reads the status through Modbus registers:

### 1. State Machine Mode (only available in Server mode):

- ResultACK Clears Results: After the PLC successfully obtains the latest result, this bit is set, and the ResultsOK and ResultsNG bits are cleared.
- Control (coil/holding register): A coil is suitable for sending switch commands such as start/stop 0/1 signals. A holding register is suitable for sending numeric parameters.
- Status (holding register/discrete input/input register): A holding register can be written with status values by the PLC. A discrete input is specially used for read-only switching values and is written directly by hardware. An input register is a read-only numeric status.
- PLC Output (holding register/input register): Selecting a holding register or input register depends on whether the data is written one-way by the PLC (input register is stricter) or requires bidirectional interaction (holding register is more general).

Configuration of communication TCP

☐ TcpServer  
☒ Use ModbusTCP

☒ Server ☐ Client

☐ Byte exchange  
☒ State machine mode ☐ Status Register Mode

Modbus service port:   
 Device station No.:

☒ ResultAck clear result

| Name    | address space    | Offset | Number |
|---------|------------------|--------|--------|
| Control | Holding register | 0      | 2      |
| Status  | Holding register | 2      | 2      |
| PLC out | Holding register | 7000   | 2005   |

### 2. Status Register Mode:

- Status Register Address: Starting register address for storing device status.
- Status Update Delay: Delay time for status updates. 0 means no delay and immediate update.

Configuration of communication TCP

☐ TcpServer  
☒ Use ModbusTCP

☒ Server ☐ Client

☐ Byte exchange  
☐ State machine mode ☒ Status Register Mode

Modbus service port: 502

Device station No.: 1

Transmission address: 10

Length of transmission data bit: 10

Trigger address: 0

Length of trigger data bit: 10

Status register address: 50

Status update delay: 0 ms

### 5.6.3 Using the MC Protocol

When the MC protocol is selected, the communication method used for network data transmission can be TCP or UDP.

- MC Server IP: IP address of the connected device.
- MC Server Port: Communication port number for connecting to the MC server.
- UDP Local Port Number: Appears when UDP is selected. Used as the port number for connecting to the code reader.
- Device Station Number: Station number of the connected device.
- Device Network Number: Network number of the connected device.
- Data Transmission Type: ASCII or binary.
- Transmission Address: Address corresponding to PLC data transmission.
- Transmission Data Bit Length: Length of data bytes.
- Trigger Address Type: D means the register type used is a holding register; Y means the register type used is a coil register.
- Trigger Address: Register address corresponding to the PLC triggering the code reader to start reading.
- Trigger Data Bit Length: Number of registers corresponding to receiving the trigger command.

Configuration of communication
TCP

☐ TcpServer  
☐ Use ModbusTCP  
☒ Use MC

☒ Tcp ☐ UDP  
☐ Status Register Mode

MC service IP  
MC service port 502  
Device station No. 0  
Device network No. 0  
Data transmission type ASCII  
Transmission address 10  
Length of transmission data bit 10  
trigger addr type D  
Trigger address 0  
Length of trigger data bit 10

Configuration of communication
TCP

☐ TcpServer  
☐ Use ModbusTCP  
☒ Use MC

☐ Tcp ☒ UDP  
☐ Status Register Mode

MC service IP  
MC service port 502  
UDP local port 18100  
Device station No. 0  
Device network No. 0  
Data transmission type ASCII  
Transmission address 10  
Length of transmission data bit 10  
trigger addr type D  
Trigger address 0  
Length of trigger data bit 10

#### Status register mode:

- Status Register Address Type: D means the register type used is a holding register; X means the register type used is a coil register.
- Status Register Address: Starting register address for storing device status.
- Status Update Delay: Delay time for status updates. 0 means no delay and immediate update.
- Delayed Status Clearing: Controls delayed status clearing and sets the delay time for clearing status.

Configuration of communication TCP

☐ TcpServer  
☐ Use ModbusTCP  
☒ Use MC

☒ Tcp ☐ UDP  
☒ Status Register Mode

MC service IP:   
 MC service port:   
 Device station No.:   
 Device network No.:   
 Data transmission type:   
 Transmission address:   
 Length of transmission data bit:   
 trigger addr type:   
 Trigger address:   
 Length of trigger data bit:   
 status reg addr type:   
 Status register address:   
 Status update delay:  ms  
☐ Delayed clear status  
 Delay Time:  ms

☐ Use TCPClient

#### 5.6.4 Using the TCP Client Protocol

When TCP Client is selected as the communication method, server IP, TCP port number, and other parameters must be configured.

- Server IP: IP address of the connected device.
- TCP Port: Port number of the connected device.
- KeepAlive Enable: TCP connection keep-alive mechanism to prevent disconnection caused by long periods without communication.
- Ping Function Enable: Allows the code reader to send ping packets to test whether the PLC is online.
- Heartbeat: Used to test TCP connection status.
  - Sending Interval (ms): Time interval for sending each heartbeat identifier.
  - Heartbeat Timeout (ms): Maximum time to wait for a response after sending a heartbeat.
  - Heartbeat Identifier Character: Defines the heartbeat character recognition between the code reader and the server.
- Plus Sign: After adding, the code reader can connect to multiple servers.

Configuration of communication TCP

☐ TcpServer  
☐ Use ModbusTCP  
☐ Use MC  
☒ Use TCPClient

☒ Client1

Server IP: 169.254.153.101  
 TCP port: 5000  
☐ KeepAlive Enable  
☐ Ping function enabled  
☐ heartbeat

Sending interval (ms): 1000  
 Heartbeat timeout (ms): 2000  
 Heartbeat identifier: online

+

☐ Use EtherNet/IP  
☐ Use Profinet  
☐ Use Fins  
☐ Use UDP  
☐ Use FTP  
☐ Use HTTP

Communication interaction customization

### 5.6.5 Using the EtherNet/IP Protocol

Use State Machine Mode: If unchecked, the device can be triggered by an external trigger and the PLC can directly receive code reading data. If checked, triggering and reading can only be controlled by signals, and this function cannot be used with other external trigger methods.

- Reverse Result High/Low Byte Order: When unchecked by default, the result area has big-endian/little-endian ordering.
- End Task Immediately When Trigger Returns to Zero: Controls code reading end. If checked, the code reading task ends immediately after Trigger returns to zero. If unchecked, the code reading task does not end immediately after Trigger returns to zero and instead ends after the task time or other settings in the trigger configuration are completed.
- ResultAck Clears Results: After the PLC successfully obtains the latest result, this bit is set, and ResultsOK and ResultsNG are cleared.
- Input Assembly Size: Sets the input assembly byte size.
- Output Assembly Size: Sets the output assembly byte size.
- Network Link Bit: Used by the PLC to determine whether the scanner EIP function is in normal status. The time can be set, and the bit alternates 0-1-0-1.

Configuration of communication TCP

☐ TcpServer  
☐ Use ModbusTCP  
☐ Use MC  
☐ Use TCPClient  
☒ Use EtherNet/IP

☒ Use state machine mode  
☐ Result high low reverse order  
☐ terminate task when trigger bit turn 0  
☒ ResultAck clear result

Input component size 200 byte  
 Output component size 200 byte  
☐ Network connection bit  
 Time 500 ms

☐ Use Profinet  
☐ Use Fins  
☐ Use UDP  
☐ Use FTP  
☐ Use HTTP

Communication interaction customization

Add customization: +

#### 5.6.6 Using the PROFINET Protocol

- Use State Machine Mode: When checked, the code reader must be triggered according to the timing logic diagram. When unchecked, other external trigger methods can be used to directly feed back results and code reading status to the PLC.
- End Task Immediately When Trigger Returns to Zero: Controls code reading end. If checked, the code reading task ends immediately after Trigger returns to zero. If unchecked, the code reading task does not end immediately after Trigger returns to zero and instead ends after the task time or other settings in the trigger configuration are completed.
- ResultAck Clears Results: After the PLC successfully obtains the latest result, this bit is set, and ResultsOK and ResultsNG are cleared.
- PROFINET Device Name: Sets the device name for the connected device.
- Output Result Module Size: Selects a specified byte size to store code reading results. The default is 64 bytes.

Configuration of communication TCP

☐ TcpServer  
☐ Use ModbusTCP  
☐ Use MC  
☐ Use TCPClient  
☐ Use EtherNet/IP  
☒ Use Profinet

☒ Use state machine mode  
☐ terminate task when trigger bit turn 0  
☒ ResultAck clear result

Profinet name

Output result module size 64 byte

☐ Use Fins  
☐ Use UDP  
☐ Use FTP  
☐ Use HTTP

Communication interaction customization

Add customization:

### 5.6.7 Using the FINS Protocol

End Task Immediately When Trigger Returns to Zero: Controls code reading end. If checked, the code reading task ends immediately after Trigger returns to zero. If unchecked, the code reading task does not end immediately after Trigger returns to zero and instead ends after the task time or other settings in the trigger configuration are completed.

- Protocol Type: Selects TCP/UDP protocol.
- PLC IP: IP address of the connected device.
- Port Number: Port number of the connected device.
- Node Address: Connection address of the connected device.
- DM Start Address: DM start address of the connected device.
- DM Area Length: DM area length of the connected device.
- Control Area Result Space: PLC data area used to store code reading results, including DM and CIO.
- Control Area Start Address: Start address of the control area of the connected device.
- Data Area Start Address: Start address of the data area of the connected device.
- Status Update Delay: Sets the time interval for the device to update status data to PLC registers.
- Continuous Decoding: Controls whether the device continuously performs barcode recognition after being triggered and sets the continuous reading interval.

Configuration of communication TCP

☐ Use Profinet

☒ Use Fins

☐ terminate task when trigger bit turn 0

Protocol: Tcp

PLC IP:

Port Number: 9600

Node Address: 2

DM Start Address: 1000

DM area length (words): 500

Control Area Result Space: DM

Starting address of control area: 100

Starting address of status area: 110

Status update delay: 0 ms

☐ Continued decoding

interval: 1000 ms

☐ Use UDP

☐ Use FTP

☐ Use HTTP

Communication interaction customization

Add customization: +

### 5.6.8 Using the UDP Protocol

- Host IP: IP address of the UDP server.
- Host Communication Port: Open port number of the UDP server.
- Scanner Communication Port: Port number used by the code reader for communication connection.

Configuration of communication TCP

☐ TcpServer

☐ Use ModbusTCP

☐ Use MC

☐ Use TCPClient

☐ Use EtherNet/IP

☐ Use Profinet

☐ Use Fins

☒ Use UDP

host ip:

host port: 0

device port: 18000

☐ Use FTP

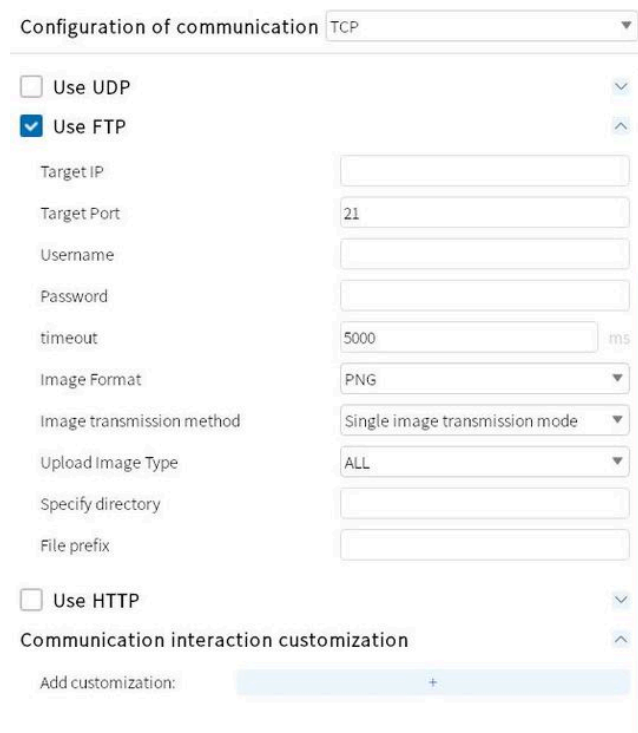
☐ Use HTTP

Communication interaction customization

Add customization: +

### 5.6.9 Using the FTP Protocol

- Target IP: IP address of the FTP server, used for device communication connection.
- Target Port: Communication port number of the FTP server.
- User Name: Specified user, optional.
- Password: User password, optional.
- Timeout: Time after which the FTP connection is automatically disconnected if there is no communication. Range: 0 to 999999 ms.
- Image Format: Image format to be uploaded: PNG or JPG.
- Image Transmission Mode: Single-image transmission mode transmits only the last image of the task. Multi-image transmission mode transmits all images in the task.
- Upload Image Type: Image type to be uploaded: ALL, OK, or NG.
- Specified Directory: Name of the directory to be created, optional.
- File Prefix: Prefix of the saved image name, optional.



The screenshot shows a configuration window titled "Configuration of communication". At the top, there is a dropdown menu set to "TCP". Below this, there are two main sections: "Use UDP" (unchecked) and "Use FTP" (checked). Under the "Use FTP" section, there are several input fields: "Target IP" (empty), "Target Port" (set to 21), "Username" (empty), "Password" (empty), "timeout" (set to 5000 ms), "Image Format" (set to PNG), "Image transmission method" (set to Single image transmission mode), "Upload Image Type" (set to ALL), "Specify directory" (empty), and "File prefix" (empty). Below these fields, there is a section for "Use HTTP" (unchecked). At the bottom, there is a section titled "Communication interaction customization" with a sub-label "Add customization:" and a blue button with a "+" sign.

### 5.6.10 Using the HTTP Protocol

- URL: Server interface address used to receive data uploaded by the device.
- Timeout: Sets the waiting time for HTTP requests.
- Data Type: Default data or custom data.
- Image Upload: Uploaded image format: PNG or JPG. Uploaded image type: ALL, OK, or NG. A file-name prefix can be specified, optional.

Configuration of communication TCP

- ☐ Use EtherNet/IP
- ☐ Use Profinet
- ☐ Use Fins
- ☐ Use UDP
- ☐ Use FTP
- ☒ Use HTTP

URL:

timeout:

data type:

☐ image upload

Image Format:

Upload Image Type:

File prefix:

Communication interaction customization

Add customization:

#### 5.6.11 Custom Communication Interaction

Both Ethernet and serial protocols support custom data interaction, used for data interaction between the code reader and lower-level devices/controllers.

Configuration of communication TCP

- ☐ TcpServer
- ☐ Use ModbusTCP
- ☐ Use MC
- ☐ Use TCPClient
- ☐ Use EtherNet/IP
- ☐ Use Profinet
- ☐ Use Fins
- ☐ Use UDP
- ☐ Use FTP
- ☐ Use HTTP

Communication interaction customization

Add customization:

#### 5.6.12 Serial Port

**Enable Serial Port Device Discovery:** The device can automatically search for and discover connectable devices through the serial port to facilitate establishing serial communication.

**Escape Special Characters (Serial to HID):** Sets whether to escape special characters when converting serial data to HID.

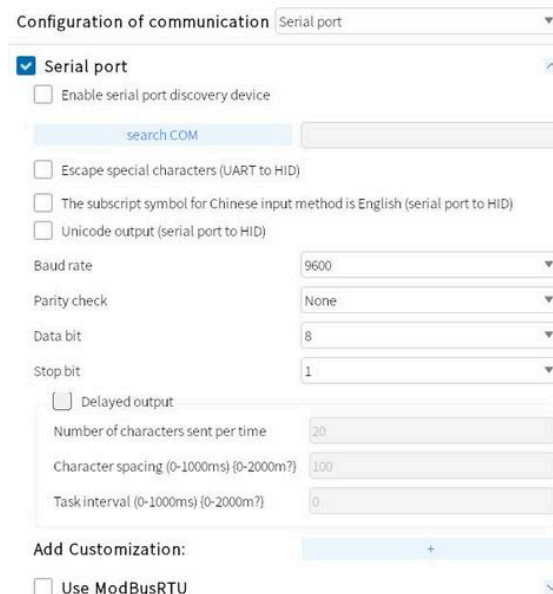
Use English Punctuation under Chinese Input Method (Serial to HID): In HID keyboard output mode, punctuation marks are still output in English-symbol format.

Unicode Output (Serial to HID): In HID keyboard output mode, the device outputs characters using Unicode encoding.

When the communication protocol is set to Serial, the following parameters can be configured:

- Serial Baud Rate: Sets the baud rate of the receiving end.
- Serial Parity: Sets the serial parity bit of the receiving end.
- Serial Data Bits: Sets the serial data bits of the receiving end.
- Serial Stop Bit: Sets the serial stop bit of the receiving end.
- Delayed output:
- Number of Characters Sent Each Time: Sets the number of characters sent each time data is sent.
- Character Interval (0-2000 ms): Sets the time interval between consecutively sent characters.
- Task Interval (0-2000 ms): Sets the time interval between two data sending tasks.

**Add Custom:** Users can set custom input and output according to actual requirements.



Configuration of communication Serial port

☒ Serial port

☐ Enable serial port discovery device

search COM

☐ Escape special characters (UART to HID)

☐ The subscript symbol for Chinese input method is English (serial port to HID)

☐ Unicode output (serial port to HID)

Baud rate: 9600

Parity check: None

Data bit: 8

Stop bit: 1

☐ Delayed output

Number of characters sent per time: 20

Character spacing (0-1000ms) (0-2000m?): 100

Task interval (0-1000ms) (0-2000m?): 0

Add Customization: +

☐ Use ModBusRTU

### 5.6.13 Using the Modbus RTU Protocol

When Modbus RTU is selected, parameters such as the device station number must be configured.

- Device Station Number: Station number of the connected device.
- Transmission Address: Address corresponding to PLC data transmission.
- Transmission Data Bit Length: Length of data bytes.
- Trigger Address: Address required for the PLC to trigger the camera.
- Trigger Data Bit Length: Length of data bits required for triggering.

Configuration of communication Serial port

☒ **Serial port**

☐ Enable serial port discovery device

search COM

☐ Escape special characters (UART to HID)

☐ The subscript symbol for Chinese input method is English (serial port to HID)

☐ Unicode output (serial port to HID)

Baud rate: 9600

Parity check: None

Data bit: 8

Stop bit: 1

☐ Delayed output

Number of characters sent per time: 20

Character spacing (0-1000ms) (0-2000m7): 100

Task interval (0-1000ms) (0-2000m7): 0

Add Customization: +

☒ **Use ModBusRTU**

☒ Server ☐ Client

☐ Byte exchange

Device station No.: 2

Transmission address: 10

Length of transmission data bit: 10

Trigger address: 0

Length of trigger data bit: 10

#### 5.6.14 USB

The USB communication configuration interface of the code reader is divided into two modules: USB serial port (virtual serial port mode) and USB cursor output (keyboard emulation mode).

##### USB serial port parameters:

- Baud Rate: Sets the serial baud rate of the receiving end.
- Parity: Sets the serial parity bit of the receiving end.
- Data Bits: Sets the serial data bits of the receiving end.
- Stop Bit: Sets the serial stop bit of the receiving end.
- USB cursor output parameters:
- Ignore Caps Lock: When selected, USB outputs the barcode content itself and is not affected by the Caps Lock key.
- Character Inversion: When selected, uppercase characters are converted to lowercase during output and lowercase characters are converted to uppercase.
- Upper/Lowercase Conversion: When uppercase is selected, all characters are output as uppercase. When lowercase is selected, all characters are output as lowercase.
- Ignore Chinese Input Method: When selected, output is not affected under a Chinese input method.
- Use English Punctuation under Chinese Input Method: Automatically converts Chinese punctuation in the output content to English punctuation.
- Unicode Output: Outputs characters using Unicode encoding.
- GBK Output: Outputs Chinese characters using GBK encoding.
- Number of Characters Sent Each Time: Sets the overall number of characters to send. The maximum value is 1.
- Character Interval (0-2000 ms): Sets the interval between characters.
- Task Interval (0-2000 ms): Sets the interval between tasks.

- USB Version Switching: Used to switch between USB 1.1 and USB 2.0.
- Interval: Controls transmission scheduling.

Configuration of communication USB

☐ USB serial port

Search COM

Baud rate 115200

Parity check None

Data bit 8

Stop bit 1

Add Customization: +

☒ USB cursor output

☒ Ignore Capslock

☐ Character inversion

☐ toggle case capitalization small letter

☐ Ignore Chinese input method

☐ The subscript symbols in Chinese input method are in English

☐ Unicode output

☐ GBK output

Number of characters sent per time 1

Character spacing (0-100 ms) {0-2000ms} 0

Bar code interval (0-100 ms) {0-2000ms} 0

USB version switching USB2.0

interval 4

## 5.7 Configuration Management

Configuration management can save, load, and restore the device's current parameters to the default saved configuration.

- Save Settings: Saves current parameters to a parameter group. User configurations 1 to 10 can be selected.
- Load Settings: Parameters can be loaded in real time by selecting Configuration 1 to Configuration 10.
- Restore Factory Configuration: When clicked, device parameters are restored to factory settings.

Manage configuration

Save Configuration

1: Configuration1 Confirm

Load Configuration

1: Configuration1 Confirm

Restore factory parameters

## 5.8 Settings

### 5.8.1 Device Settings

- Device Name: Modifies the code reader device name. Chinese, English, letters, characters, numbers, and more are supported.
- Whether Networked Master Sends Connection Status: When enabled, the networked master sends the networking connection status.
- Whether Continuous/Software Trigger Results Are Sent Externally: When enabled, code reader results are transmitted externally in continuous mode or software trigger mode.
- Missed Trigger Statistics: When enabled, missed triggers are counted in statistics mode.
- Simultaneous Listening to External Trigger Sources: The device can listen to multiple external trigger signal sources at the same time to improve trigger compatibility.
- Auto Connect (valid for the current PC): The software automatically connects to the current device when started.
- Device Discovery Mode When Connected by USB: Includes Disable Device Discovery, Virtual Network Adapter, and Virtual Serial Port.
- Debug LOG Information: Enables or disables debug log output.
- Automatically Save Historical Result Summary Data: The system automatically saves historical code reading result statistics for the device.
- Algorithm Calculation Switch: Enables or disables code reading algorithm calculation.
- Camera TIMEOUT Handling Setting: Sets how the device handles image acquisition timeout from the camera.
- Allow Same Code at Different Positions When Multi-code Is Enabled: In multi-code recognition scenarios, allows recognition of barcodes with the same content at different positions.
- Do Not Count Results in Continuous Mode: Results recognized in continuous trigger mode are not included in statistics.
- Pixel Difference: Sets the pixel difference threshold during image processing to improve recognition stability.
- Whether Duplicate Filtering Outputs Filtered Results: Sets whether recognition results filtered out by duplicate filtering are output when duplicate code filtering is enabled.
- Running Frame Rate Upper Limit: Limits the maximum frame rate during device operation to control device processing speed and system resource usage.

|                                                                    |                 |
|--------------------------------------------------------------------|-----------------|
| Name of device                                                     | VS2000-2022-026 |
| Is the networking host sending out connection status               | No              |
| send out continuous/software                                       | Yes             |
| Missing trigger statistics                                         | Close           |
| Simultaneous monitoring of external trigger sources                | Close           |
| Automatic connection (currently valid on PC)                       | Close           |
| Debugging Log Information                                          | Close           |
| Automatically save historical result summary data                  | Open            |
| Algorithm calculation switch                                       | Open            |
| Camera TimeOut processing settings                                 |                 |
| Multi code enable allows different positions to have the same code | Close           |
| Continuous mode results not statistics                             | Open            |
| Pixel difference                                                   | 200             |
| Does repeated filtering output filtered results                    |                 |
| Maximum frame rate for operation                                   | 100             |

### Barcode command settings:

- Return Value: Enables or disables the data content returned after the device executes a barcode command.
- All-mode Setting: Uniformly sets barcode recognition related parameters.

### Buzzer settings:

- Decoding Sound: Can be off, on after successful decoding, or on after successful/failed decoding.
- Sound Duration: Can be set to 40 ms, 80 ms, or 120 ms.
- Buzzer Duration: Can be Short, Medium, Long, or Custom.
- Buzzer Frequency: Can be Short, Medium, Long, or Custom.

### Button settings:

- Trigger Button: On/off.
- Function Button: On/off.
- Positioning Light: On/off.
- Code Reading Status Indicator: On/off.

### Image transmission settings:

- Image Transmission Type: Supports PNG/JPG/center/ROI image crop selection.
- NG Image Transmission Number: Sets the number or rule for uploading images when recognition fails (NG).
- Reduce Image Transmission Frequency: Reduces image upload frequency to lower network bandwidth usage.

#### SDK communication settings:

- SDK Communication: On/off.
- Web Debugging SDK: On/off.

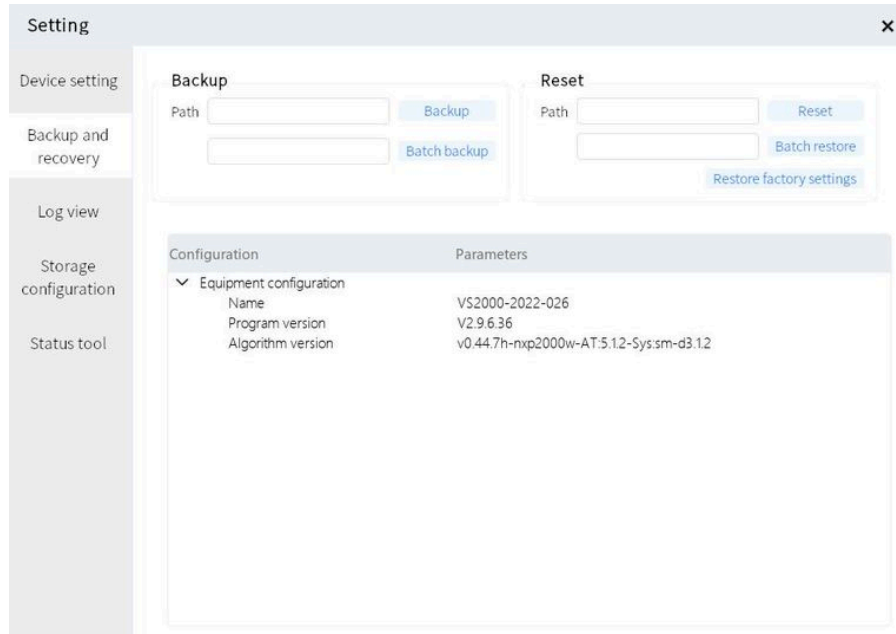
#### Rendering settings:

- Scan Result Rendering: Sets the display rendering text for code reading results. Options include Follow, Do Not Follow, and Off.
- Positioning Box Rendering: Sets whether to display the barcode positioning box in the image.
- Actual Result Output: Sets the final recognition result content or format output by the device to an external system.

| Barcode instruction settings                                                                                                    |                              |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| return value                                                                                                                    | Close                        |
| Full mode setting                                                                                                               | Close                        |
| Buzzer setting                                                                                                                  |                              |
| Decoding sound                                                                                                                  | Close                        |
| Sound duration                                                                                                                  | Medium (80ms)                |
| Buzzer duration                                                                                                                 | centre                       |
| Buzzer frequency                                                                                                                | centre                       |
| Button setting                                                                                                                  |                              |
| Trigger button                                                                                                                  | Open                         |
| Function button                                                                                                                 | Open                         |
| Positioning lamp                                                                                                                | Close                        |
| Reading status indicator light                                                                                                  | Open                         |
| Trigger fill light to remain on                                                                                                 | Close                        |
| Map transfer settings                                                                                                           |                              |
| Image Type                                                                                                                      | .jpg compression image       |
| Compression ratio                                                                                                               | 50                           |
| NG upload image number                                                                                                          |                              |
| Reduce the frame rate of image transmission                                                                                     | Close image transmission int |
| SDK communication settings                                                                                                      |                              |
| SDK communication                                                                                                               | Close                        |
| Web Debugging SDK                                                                                                               | Close                        |
| Render settings                                                                                                                 |                              |
| Scanning result rendering                                                                                                       | Do not follow                |
| Positioning box rendering                                                                                                       | Close                        |
| Actual result output                                                                                                            | Close                        |
| <input type="button" value="Sync time to device"/> <input checked="" type="checkbox"/> Automatically synchronize when connected |                              |
| <input type="button" value="reboot device"/>                                                                                    |                              |
| <input type="button" value="Save current setting"/>                                                                             |                              |

#### 5.8.2 Backup and Restore

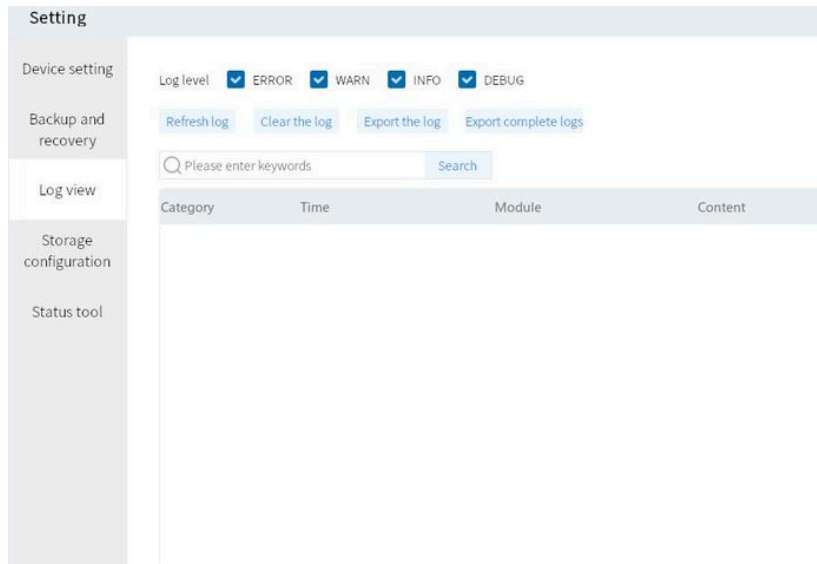
The code reader can back up settings and other information to the PC, restore settings, and restore factory settings.



### 5.8.3 Log Viewing

Log levels such as ERROR, WARN, INFO, and DEBUG can be viewed.

Operations include Refresh Log, Clear Log, Export Log, and Export Full Log.



### 5.8.4 Storage Configuration

PC save configuration:

- Code Reader Save Configuration: Data recording, display original image, decoded image, and undecoded image can be enabled or disabled.
- Save Method: Continuous saving, save by day, or save by task.
- Data Filtering: Custom data filtering rules such as Time, OK/NG, Task Name, and Barcode Type can be selected.
- Save Type: Original image, preprocessed image, or result rendering image.

- **Storage Path and Prefix:** The storage paths and prefixes for decoded and undecoded images can be customized. Image naming methods include naming by content and naming by time.

Save configuration on the upper computer

Save configuration on PC

Hard disk alarm  GB

Data record ☐

Path

File name

Save as

Data filtering

Show original image ☐

Save Type ☐ Raw image ☒ Preprocessing diagram ☐ Result rendering

☐ Save images by day

Decode image ☐

Path

Prefix

Undecoded image ☐

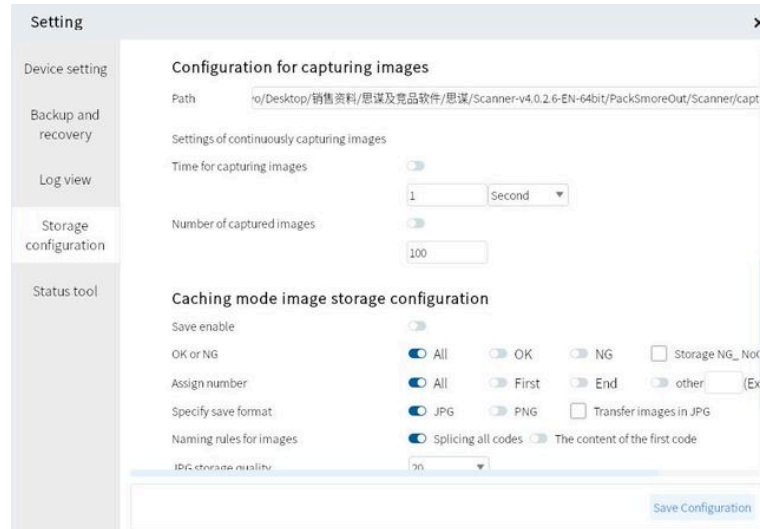
Path

Prefix

Naming convention for images

#### Image capture configuration:

- **Image Capture Configuration:** Image capture path can be saved.
- **Image Capture Time:** 1 s to 60 min.
- **Capture Quantity:** 2 to 10000 images.
- **Cache mode image storage configuration:**
- **Enable Image Storage Function:** Enables or disables cache image storage.
- **Specify OK/NG Type:** Selects which recognition results require image saving. Options include All, OK, NG, and store NG\_NoCode images.
- **Specify Number:** Specifies the task number for saving images.
- **Specify Save Format:** Selects the image format for saving. Options include JPG, PNG, and transmit as JPG.
- **Image Naming Rule:** Sets the file naming method for saved images.
- **JPG Storage Quality:** Sets JPG compression quality.
- **Center Offset:** Sets the crop center offset when saving images.
- **Storage Path:** Sets the local storage directory for images.

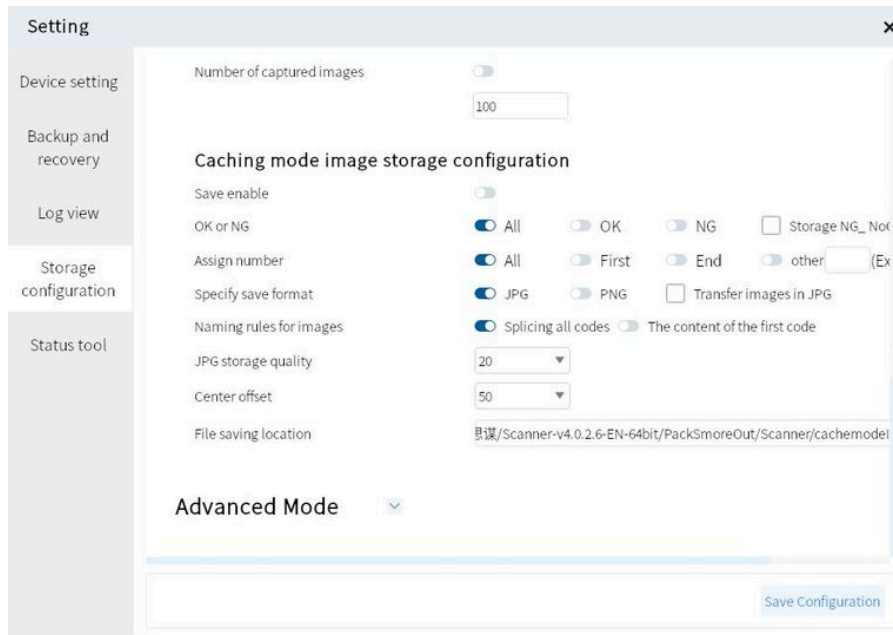


#### Advanced mode:

1. Code Reader Save Configuration: Sets the image or data types that the code reader needs to save during operation.
2. Storage Path: Obtains stored data or images from the code reader device.
3. Content Selection: Selects the data type to be downloaded.

#### Task image storage:

1. Enable Task Image Storage: Automatically saves images during task operation.
2. Save Image Type: Sets the type of task image to save.
3. Path: Sets the local storage path for task images.



## 5.8.5 Status Tools

Setting
Device setting
Backup and recovery
Log view
Storage configuration
Status tool

I/O status
Refresh
recount

IN0 0 IN1 0  
OUT0 0 OUT1 0 OUT2 0

communication status
Ethernet/IP
Refresh

Input image area

| Byte   | BIT7            | BIT6 | BIT5 | BIT4 | BIT3     | BIT2      | BIT1        | BIT0          |
|--------|-----------------|------|------|------|----------|-----------|-------------|---------------|
| 0-1    | Reserved        |      |      |      |          |           |             |               |
| 2      | network Alive   |      |      |      | Decoding | Acquiring | Trigger ack | Trigger ready |
| 3      | General Fault   |      |      |      |          |           | Results NG  | Results OK    |
| 4-17   | Reserved        |      |      |      |          |           |             |               |
| 18-19  | Result Length : |      |      |      |          |           |             |               |
| 20-max | Result data :   |      |      |      |          |           |             |               |

Output image area

| Byte  | BIT7        | BIT6         | BIT5 | BIT4 | BIT3 | BIT2       | BIT1    | BIT0           |
|-------|-------------|--------------|------|------|------|------------|---------|----------------|
| 0     |             |              |      |      |      | Result Ack | Trigger | Trigger Enable |
| 1     | Clear Error | Clear Result |      |      |      |            |         |                |
| 2-max | Reserved    |              |      |      |      |            |         |                |

- **I/O Status:** Used to view and count input and output signal status. It supports refresh and recount functions.
- **Communication Status:** Used to view the status bits of input/output registers under industrial communication protocols. Currently, EtherNet/IP, PROFINET, and Modbus TCP protocols are supported.

### EtherNet/IP

The input image area, namely code reader -> PLC controller, is defined as follows.

| Name          | Description                                                                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trigger Ready | The device is ready to receive a new trigger signal. This bit is set when Trigger Enable is set and the device is ready to receive the next trigger signal.                         |
| Trigger Ack   | The device has successfully received the trigger signal.                                                                                                                            |
| Acquiring     | The device is acquiring an image.                                                                                                                                                   |
| Decoding      | The device is recognizing and decoding the image and running algorithm processing.                                                                                                  |
| Reserved      | Reserved.                                                                                                                                                                           |
| Results OK    | The device has successfully output a new result. When the PLC sets Results Ack, this bit is cleared.                                                                                |
| Results NG    | The device did not read a code or did not obtain an output result. When the PLC sets Results Ack, this bit is cleared. Note: When using the NG signal, disable the NoRead function. |
| General Fault | An internal device error has occurred. This signal can be                                                                                                                           |

| Name          | Description                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | cleared by ClearError.                                                                                                                                                                                                                                                                                     |
| Result Length | Length of valid data contained in the result area; number of characters in the result data.                                                                                                                                                                                                                |
| Result Data   | Device code reading result. The results are stored continuously in ASCII format. If the result data length is less than the configured result module size, the remaining data is filled with 0. If the result data length is greater than the configured result module size, the excess data is truncated. |

The output image area, namely PLC controller -> code reader, is defined as follows.

| Name           | Description                                                                                                                                                                                                                                             |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trigger Enable | The PLC uses this bit to enable the trigger function of the device.                                                                                                                                                                                     |
| Trigger        | When the following conditions are met, the PLC sets this bit to trigger the device to acquire one image and run the algorithm once: Trigger Enable is set; the device is not currently acquiring images or running the algorithm; Trigger Ready is set. |
| Results Ack    | After the PLC successfully obtains the latest result, this bit is set, and Results OK and Results NG are cleared.                                                                                                                                       |
| Reserved       | Reserved.                                                                                                                                                                                                                                               |
| Clear Error    | Clears the error status.                                                                                                                                                                                                                                |

### Modbus TCP

- Control Bit: Signal written by the PLC to control the code reader to execute operations.
- Status Bit: Operating status information returned by the code reader to the PLC.
- Result Area: Used to return barcode recognition data.

Setting

Device setting  
Backup and recovery  
Log view  
Storage configuration  
Status tool

I/O status Refresh recount  
IN0 0 IN1 0  
OUT0 0 OUT1 0 OUT2 0  
communication status ModbusTcp Refresh  
control bit  

| Byte | BIT7        | BIT6         | BIT5 | BIT4 | BIT3       | BIT2 | BIT1    | BIT0           |
|------|-------------|--------------|------|------|------------|------|---------|----------------|
| 0    |             |              |      |      | Result Ack |      | Trigger | Trigger Enable |
| 1    | Clear Error | Clear Result |      |      |            |      |         |                |

status bit  

| Byte | BIT7          | BIT6 | BIT5       | BIT4       | BIT3         | BIT2      | BIT1            | BIT0          |
|------|---------------|------|------------|------------|--------------|-----------|-----------------|---------------|
| 0    |               |      |            |            |              | Acquiring | Trigger ack     | Trigger ready |
| 1    | General Fault |      | Results NG | Results OK | Result Avail |           | Decoding Cmpltd | Decoding      |

result  

| Byte        | BIT7            | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|-------------|-----------------|------|------|------|------|------|------|------|
| 0-3         | Reserved        |      |      |      |      |      |      |      |
| 4           | Result Length : |      |      |      |      |      |      |      |
| 2-max (5-7) | Result data :   |      |      |      |      |      |      |      |

## PROFINET

- Control Module: The control module corresponds to the Q address (PLC output), which is the control signal written by the PLC to the code reader.
- Status Module: The status module corresponds to the I address (PLC input), indicating status information returned by the code reader to the PLC.
- Result Module: The result module is used to transmit barcode recognition result data.

Setting

Device setting  
Backup and recovery  
Log view  
Storage configuration  
Status tool

I/O status Refresh recount  
IN0 0 IN1 0  
OUT0 0 OUT1 0 OUT2 0  
communication status Profinet Refresh  
Control Module  

|           | BIT7        | BIT6 | BIT5 | BIT4 | BIT3 | BIT2       | BIT1    | BIT0           |
|-----------|-------------|------|------|------|------|------------|---------|----------------|
| Q address | Clear Error |      |      |      |      | Result Ack | Trigger | Trigger Enable |

Status Module  

|           | BIT7          | BIT6 | BIT5       | BIT4       | BIT3     | BIT2      | BIT1        | BIT0          |
|-----------|---------------|------|------------|------------|----------|-----------|-------------|---------------|
| I address | General Fault |      | Results NG | Results OK | Decoding | Acquiring | Trigger ack | Trigger ready |

Result Module  

| Byte              | BIT7          | BIT6 | BIT5 | BIT4 | BIT3 | BIT2 | BIT1 | BIT0 |
|-------------------|---------------|------|------|------|------|------|------|------|
| I address(64byte) | Result data : |      |      |      |      |      |      |      |

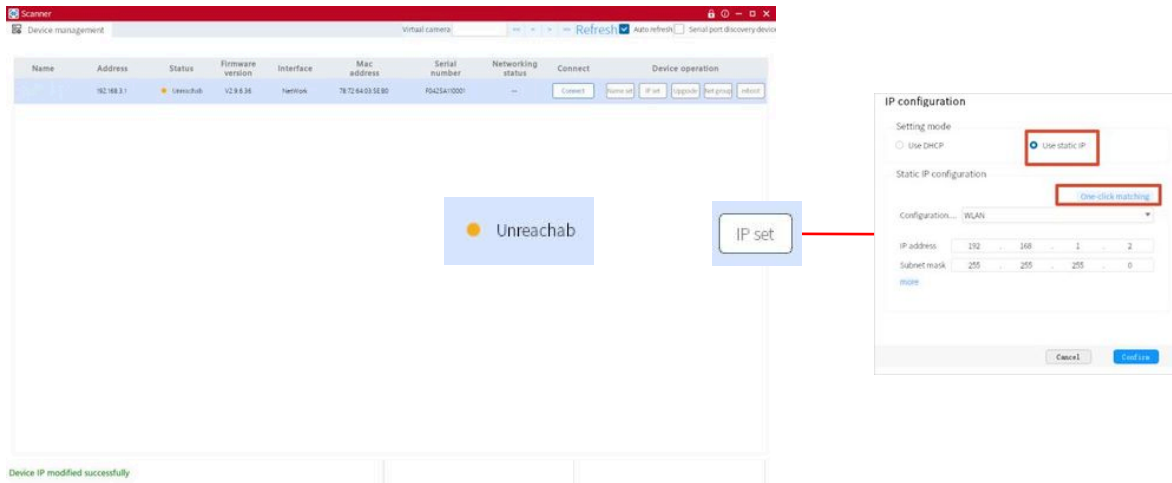
## 6.Frequently Asked Questions

### 6.1 The Client Software Has Detected the Device, but It Shows “Unreachable”

Possible causes:

- The device IP and the network adapter connected to the device are not on the same network segment.
- The network adapter has obtained IP addresses from two different network segments.

Solutions:



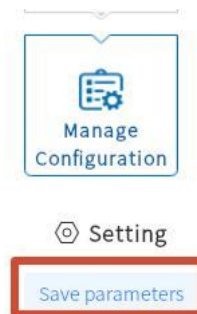
- Modify the device IP so that the computer and device are in the same network segment.

Click **Start** on the computer, enter **cmd** in the search box, right-click and run as administrator, enter **netsh winsock reset** to reset the network adapter information, and then restart the computer.

### 6.2 After Setting Debug Mode in the Client, the Setting Is Not Saved

Possible cause: The system has temporarily stored the setting parameters. After setting is completed, all settings must be saved manually.

Solution: Click **Configuration Management > Save All Configurations**.



### 6.3 How to Use the Various Trigger Modes in the Client Software

Solutions:

1. **Network Trigger:** First use third-party software for verification. Set the code reader to network trigger in the software, and set the same port, the same trigger command, and the same network IP segment. Some routers may enable IP isolation, which must be disabled.
2. **I/O Trigger:** Connect the I/O trigger signal wire. Set the code reader to I/O trigger in the software. The wiring must match the configured LINE0/1 and the trigger command must be the same. There are two wiring methods: NPN and PNP. General wiring: connect IN0/IN1 to the trigger device OUT wire, and connect IN\_COM to positive for NPN or to negative for PNP. See Section 3.2 for details.
3. **Serial Trigger:** Connect the DB9 terminal. Set the correct COM port, same baud rate, data bits, stop bits, parity bit, and same trigger command in the software.
4. **Software Trigger:** The client software and the code reader must be connected to the same network segment.

### 6.4 Network Trigger Is Unsuccessful

Possible cause: At present, the device side only supports client mode.

Solution: Adjust the PLC device network trigger mode.