

Smart Code Reader (7000 Series)

User's Manual



Foreword

Overview

This manual introduces the product information, basic parameters and quick operations of the smart code reader of 7000 series (hereinafter referred to as “the Reader”). Read carefully before using the Reader, and keep the manual safe for future reference.

Safety Instructions

The following categorized signal words with defined meaning might appear in the manual.

Signal Words	Meaning
 DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
 CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, reductions in performance, or unpredictable results.
 TIPS	Provides methods to help you solve a problem or save time.
 NOTE	Provides additional information as a supplement to the text.

Revision History

Version	Revision Content	Release Time
V1.1.0	First release.	
V1.2.0	Updated some functions and operations.	2022.6.1
V1.3.0	Content Optimization	2023.4.12

Important Safeguards and Warnings

In order to prevent danger occurrence and personnel property loss, the following is the correct use method of this product. Please read this instruction carefully before using the equipment and strictly abide by it when using it, please keep the instructions properly after reading.

Operating Requirements

- Do not place or install the equipment near the direct sunlight or heating equipment to ensure that the temperature of the shell is controlled below 60 degrees.
- Do not install the equipment in wet, dusty or soot places. If the camera is not connected to the lens, be sure to cover the lens cover to avoid dust entering.
- Please install the equipment in a stable place and pay attention to prevent this product from falling.
- Do not drop or splash liquid onto the product, and make sure that there is no object filled with liquid on the product to prevent liquid from flowing into the product.
- Install the product in a well-ventilated place, and do not block the ventilation of the product.
- Operate the SSD within the rated range of power input and output.
- Do not disassemble the product at will.
- Transport, use and store the Device under the allowed humidity and temperature conditions.
- Connect the Device (class I structure) to a power socket with protective earthing.

Power Requirements

- Use locally recommended power cord in the limit of rated specifications.
- Use the power adapter provided with the Device; otherwise it might result in people injury and device damage.
- The power source shall conform to the requirements of the Safety Extra Low Voltage (SELV) standard, and supply power with rated voltage which conforms to Limited power Source requirement according to IEC60950-1. Note that the power supply requirement is subject to the device label.
- Connect the Device (class I structure) to a power socket with protective earthing.

Table of Contents

Foreword	1
Important Safeguards and Warnings	2
1 Product description	1
1.1 Introduction	1
1.2 Features	1
1.3 Product structure	1
1.3.1 Product dimensions	1
1.3.2 Appearance description	2
1.3.3 Port	3
2 Electrical specifications	5
2.1 Power supply and network port electrical specifications	5
2.2 IO interface electrical specifications	5
2.2.1 Opto-isolated Input	5
2.2.2 Opto-isolated Output	7
2.3 I/O external wiring	8
2.3.1 Opto-isolated Input	8
2.3.2 Opto-isolated Output	10
2.4 How to avoid EMI and ESD?	11
3 Installation	13
3.1 Precautions for camera installation	13
3.1.1 Security protection conditions	13
3.1.2 Heat dissipation	14
3.2 Installation	14
3.2.1 Packing list	14
3.2.2 Installation	14
3.3 Network settings of computer	16
3.4 Installing Client	17
3.5 Connecting Camera	19
3.6 Web Client Operations	20
3.6.1 Basic Functions	20
3.6.2 Viewing Device Information	23
4 Operation settings	25
4.1 Config List	25
4.1.1 Image setup	25
4.1.2 Algorithm Settings	26
4.1.3 Result processing configuration	39
4.1.4 Input/Output control	41
4.1.5 Communication configuration	42
4.1.6 Configuration Management	44
4.2 Quick Settings	45
4.2.2 Auto Brightness	46
4.2.3 Switching Configurations	46
4.3 Menu Bar	47

4.3.1 Tools	47
4.3.2 ReadCode Log	48
4.3.3 Configuration	48
4.3.4 System	49
4.3.5 Help	54
5 FAQ	56
5.1 The application cannot find the camera device	56
5.2 The application can find the camera device, but the connection fails.	56
5.3 Camera disconnection	56
5.4 The algorithm effect does not meet the expected value.	57
5.5 Unable to enable external trigger.	57
6 Clean and Maintenance	58

1 Product description

1.1 Introduction

This product adopts high-performance photosensitive chip, and the maximum transmission rate of 1000Mb/s can meet the requirements of transmission rate in most industrial applications. It can work stably in various harsh environments, it is a high-reliability, high-price-performance ratio code reader.

1.2 Features

Easy to install, easy to operate, and comprehensive functions. Provides the following features:

- Gigabit industrial Ethernet interface, IP65 protection level
- Rich IO interfaces, Ethernet, RS232, GPIO interfaces, supporting a variety of communication protocols
- Supports rich code reading types and code quality evaluation
- Built-in deep learning algorithms and support multi-parameter polling to ensure the recognition of various and complex scenarios.

1.3 Product structure

1.3.1 Product dimensions

The product size is shown in the figure.

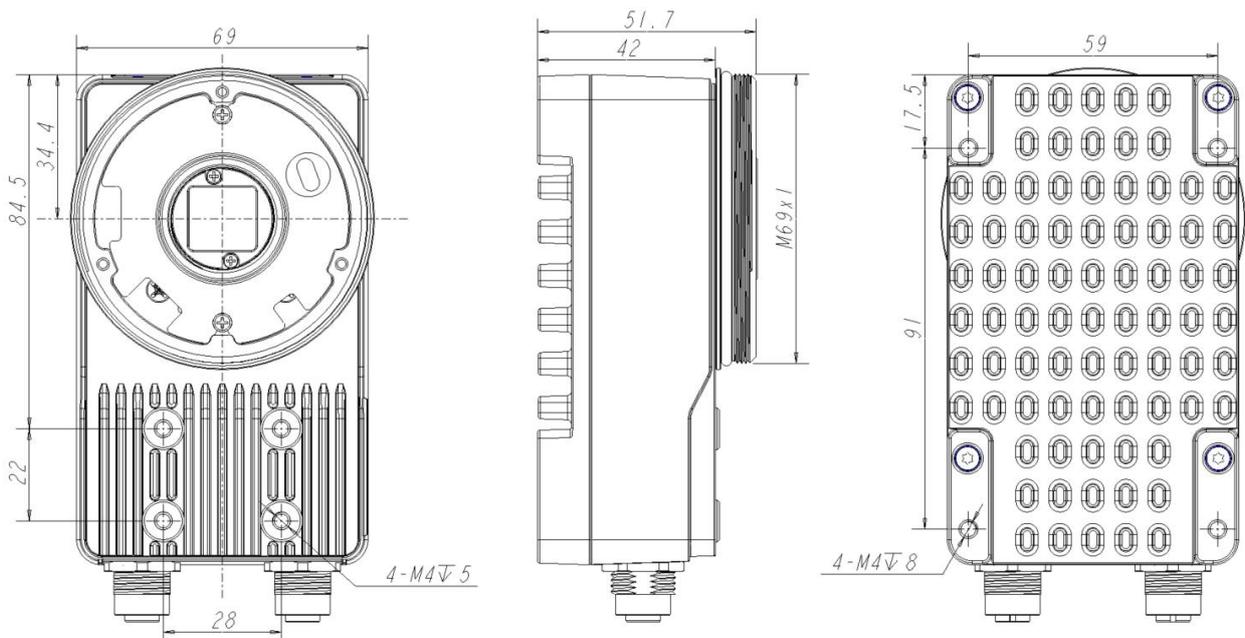


Figure 1-1 133mm * 69mm * 52mm (excluding interface height) (Unit: mm)

1.3.2 Appearance description

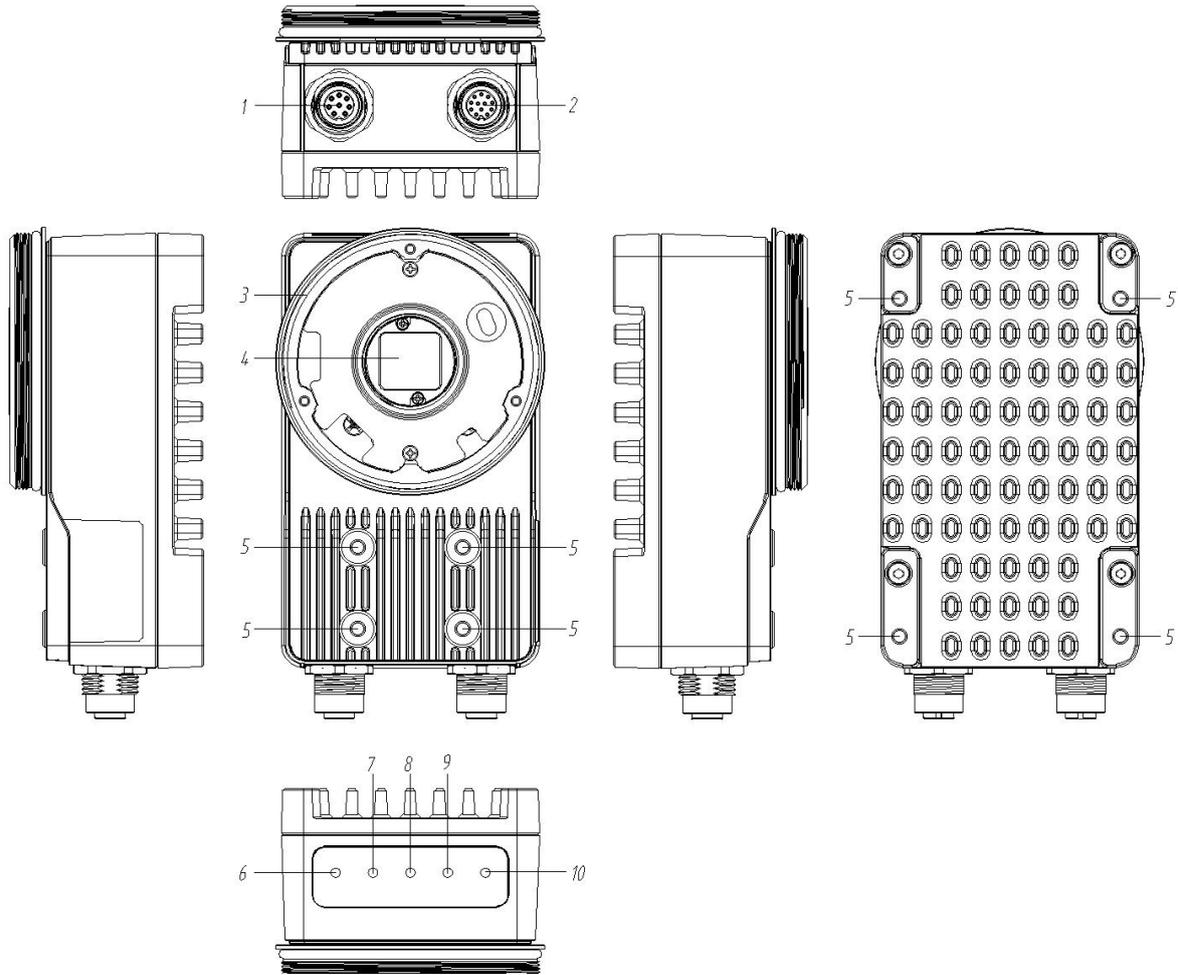


Figure 1-2 Appearance diagram of code reader

Table1-1 Device Component Description

No.	Name	Description
1	Ethernet	Network connection indicator: If the network is normal, the indicator light is green and always on.
2	Power supply and IO interface	12-core I/O interface, including power supply, I/O, RS232 serial port, etc.
3	transfer flange	It can be used to install the lens cover to protect the lens. Correctly install the lens cover can make the equipment reach the IP67 protection level.
4	Image sensor	Users collect image data.
5	Installation hole	Used to fix the equipment, you can use the screws of M4 specification that come with the box.
6	Power indicator	Power indicator: when the equipment works normally, the green light is always on, and when the power is abnormal or insufficient, the indicator light is always off
7	Status indicator light	Temporary, always not on
8	Network indicator light	Network connection indicator: If the network is normal, the indicator light is green and always on.
9	USER0	After triggering, the indicator light flickers.
10	USER1	Temporary, always not on

1.3.3 Port

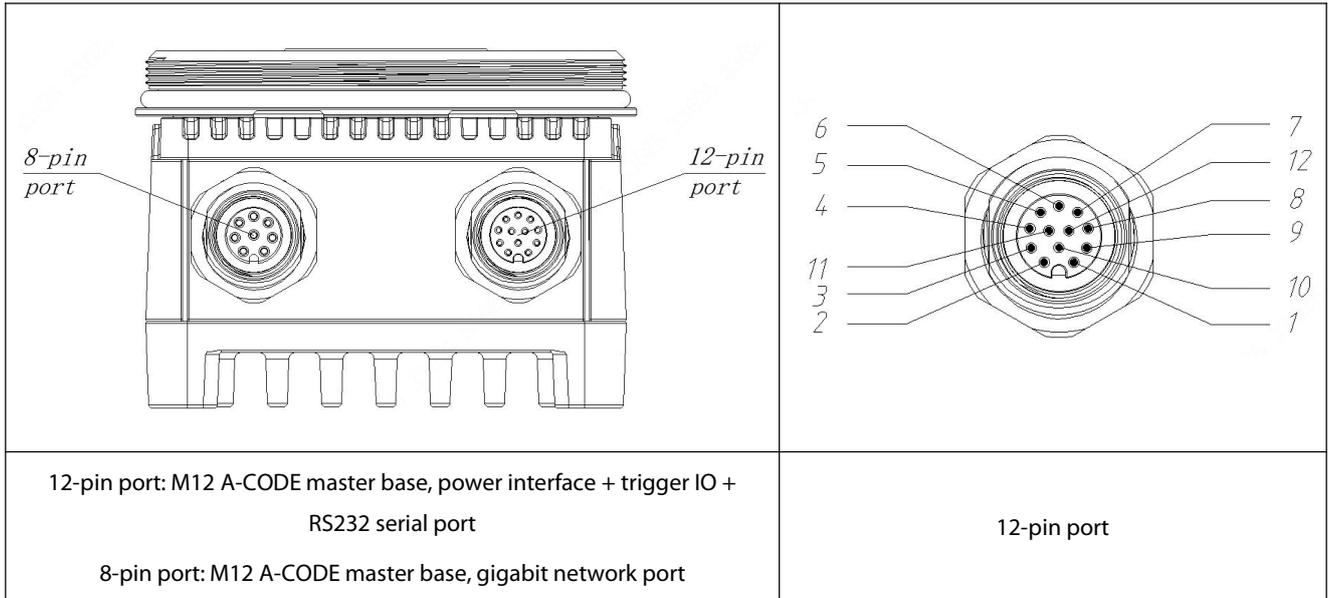


Figure 1-3 Device Port

The specific pin signal definition of the 12-core interface is shown in the following table:

Table1-2 Pin signal definition

Pin	Signal	Note	Supporting cable	Matching cable color	
1	OPT_IN1	Opto-isolated input 1	Yellow Scattering Line		Yellow
2	OPT_IN2	Opto-isolator input 2	Yellow/white scattering line		Yellow/White
3	OPT_OUT1	Opto-isolator output 1	Brown Scattering Line		Brown
4	OPT_OUT2	Opto-isolated output 2	Brown/white scattering line		Brown and white
5	COM_RXD	Serial port receiving	DB9 serial port of mother		Purple
6	OPT_IN_GND	Opto-isolated input GND	Purple/white divergence line		Purple and white
7	Power indicator light	Camera power	DC5.5 master base		Red
8	POWER_GND	Camera power ground	DC5.5 master base		Black
9	OPT_OUT_GND	Opto-isolated output GND	Green Scattering Line		Green
10	OPT_IN0	Opto-isolator input 0	Orange Scattering Line		Orange
11	OPT_OUT0	Opto-isolator output 0	Blue divergence		Blue
12	COM_TXD	Serial port sending	DB9 serial port of mother		Gray

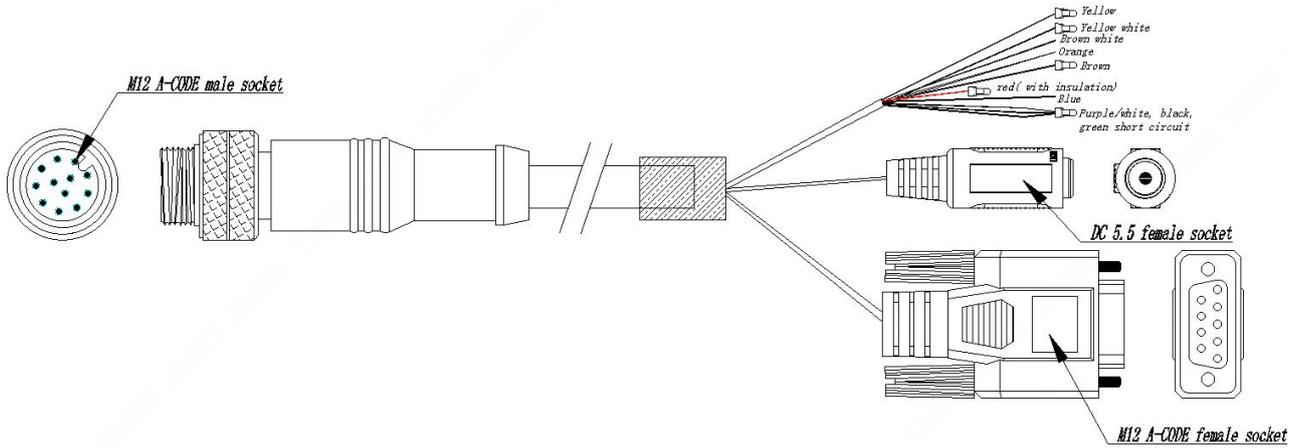


Figure 1-4 7000 series code reader matching I/O cable diagram

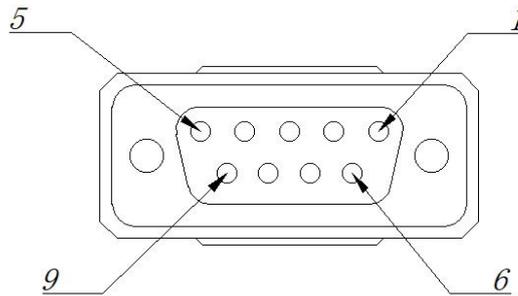


Figure 1-5 Schematic diagram of serial port mother

Table1-3 Pin signal definition

Pin	Signal	Note	Cable Core Color
2	COM_TXD	Serial port sending	■ Gray
3	COM_RXD	Serial port receiving	■ Purple
5	POWER_GND	Serial grounding	■ Black

- When using the equipment, it is recommended to use the supporting cable as shown in the above figure;
- The power supply part corresponding to the pin of interface 7 and 8 in the cable has been made into DC5.5 mother seat, and no self-wiring is required;
- The RS-232 serial port corresponding to the pins of interface 5, 8 and 12 in the cable has been made into DB9 serial port of the mother head, and no self-wiring is required;
- The cables in the cables corresponding to other pins of the interface can be wired according to actual usage requirements.

2 Electrical specifications

2.1 Power supply and network port electrical specifications

Table2-1 Power supply and network port electrical specifications

Parameter	Note
Power supply specification	DC + 9 V ~ + 26 V, <1% ripple, powered by camera 12-pin M12 connector 24AWG cable is required at least.
Data output port	1,000 Mbps Ethernet
I/O lines	1 RS232 serial port (not isolated) 3 opto-isolator inputs (LINE0~LINE1) 3 opto-isolator outputs (LINE0~LINE2)
Certification	CE, FCC



- The power supply should meet SELV and LPS specifications.

2.2 IO interface electrical specifications

2.2.1 Opto-isolated Input

Table2-2 Opto-isolator input voltage parameters

Input voltage	Description
+26VDC	Limit voltage, cannot exceed this limit, otherwise the equipment will be damaged
+0~+24VDC	Safe operating voltage input range
+0~+6VDC	Represents logic 0
+6~+9VDC	The input status changes within this range, within which the logic status is unsteady
>+9VDC	Represents logic 1

The following figure shows the typical circuit of the optocoupler isolation input:

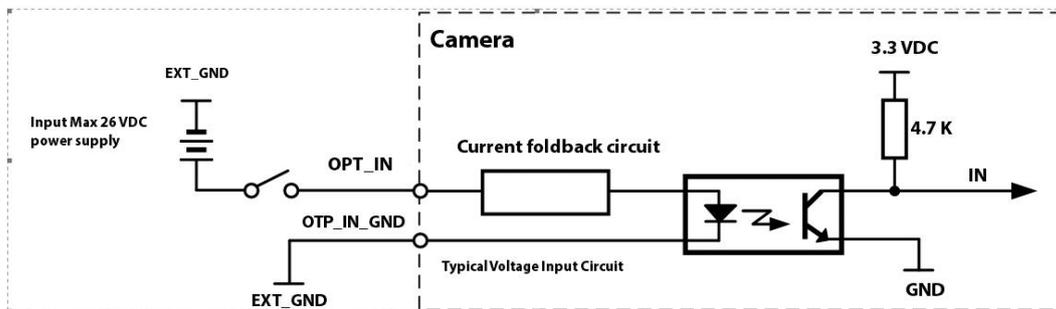


Figure 2-2 Typical optocoupler input circuit

The relationship between sink current and input voltage is shown in the following figure:

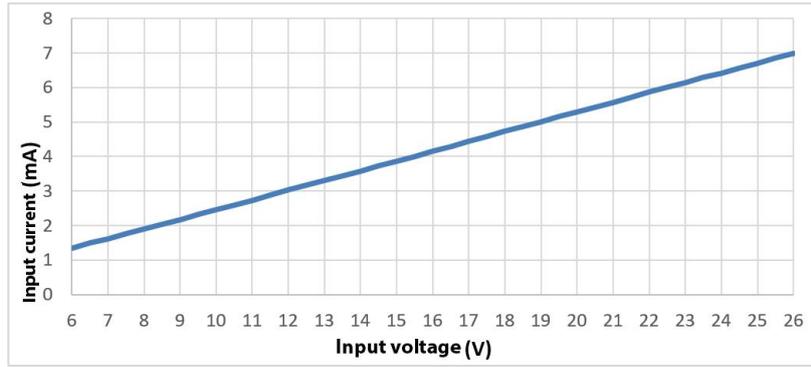


Figure 2-3 Optocoupler input characteristic curve



- The maximum inflow current of the optocoupler isolation input is 7mA.
- The values above are typical values measured at an ambient temperature of 25 degree Celsius, and there are individual differences between different cameras.

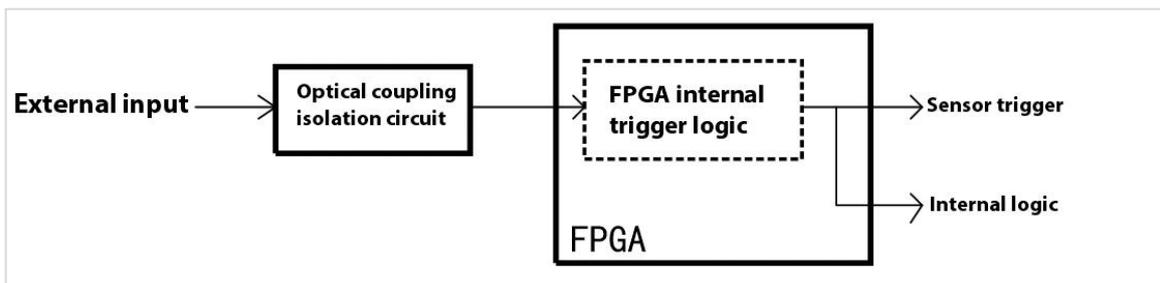
The relationship between the input signal amplitude and trigger delay is shown in the following table:

Relationship between optocoupler input signal amplitude and trigger delay

Input signal amplitude (Vp-p)	Rising edge Trigger delay tDR(us)	Falling edge Trigger delay tDF(us)
9	18.80	23.70
12	7.20	31.30
20	3.00	38.40
24	2.40	40.10
26	2.20	41.40



- The input delay measurement is based on the delay from the external optocoupler input port to the FPGA input pin, regardless of the FPGA internal logic delay.



The minimum input pulse width requirements for trigger input signals are shown in the following table:

Table2-3 Minimum pulse width requirements for optocoupler input signals

Input Signal Amplitude (Vp-p)	Minimum allowable pulse width (us)	Minimum negative pulse width (us)
9	36.00	90.00
12	10.10	90.00
20	3.10	90.00
24	2.40	90.00
26	2.10	90.00

2.2.2 Opto-isolated Output

Table2-4 Opto-isolated Output

Voltage	Description
+26VDC	Limit voltage input, which must be not exceeded; otherwise, the device may be damaged.
<+3.3VDC	I/O output may be incorrect
+3.3~+24VDC	Safe operating voltage output range

The following figure shows the typical circuit of the optocoupler isolation output:

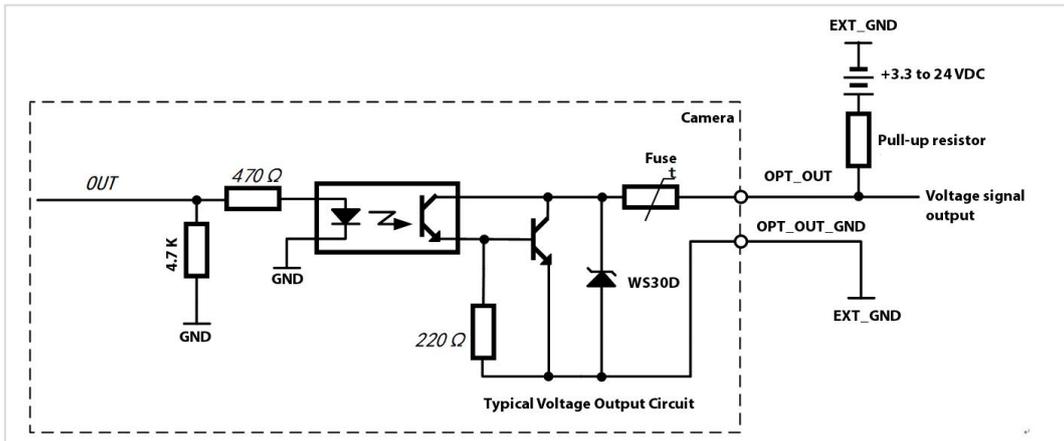


Figure 2-4 Typical optocoupler output circuit

As shown in Table 2-6, When the 1kΩ pull-up resistor is used, the rise/fall time and rise/fall edge delay time of the output under different external power supply voltages are specified.

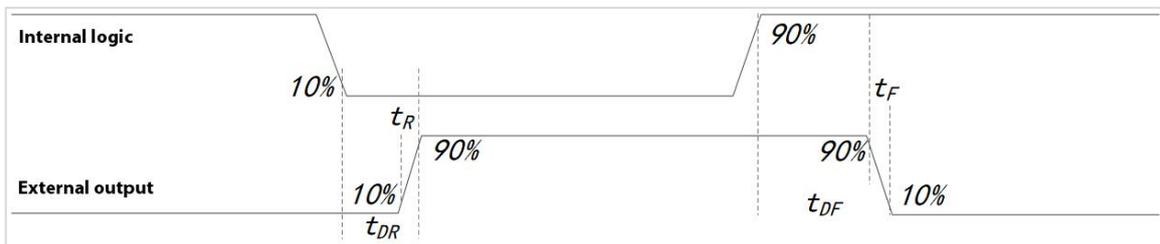


Table2-5 Relationship between optocoupler output signal amplitude and trigger delay

External Power Supply Voltage (V)	Rising Time tR (us)	Falling Time tF (us)	Rising edge Trigger delay tDR(us)	Falling edge Trigger delay tDF(us)
⑤	19.70	3.20	39.9	8.06
12	24.06	5.22	44.8	11.8
24	30.11	8.10	44.8	53.2



- The output delay measures the delay from the internal logic output of the FPGA to the external optocoupler isolation output pin, regardless of the internal logic delay of the FPGA.
- These are typical values measured at ambient temperature of 25°C, and may be different depending on camera models.

The following figure shows the relationship between the output voltage drop and output current of optocoupler isolation:

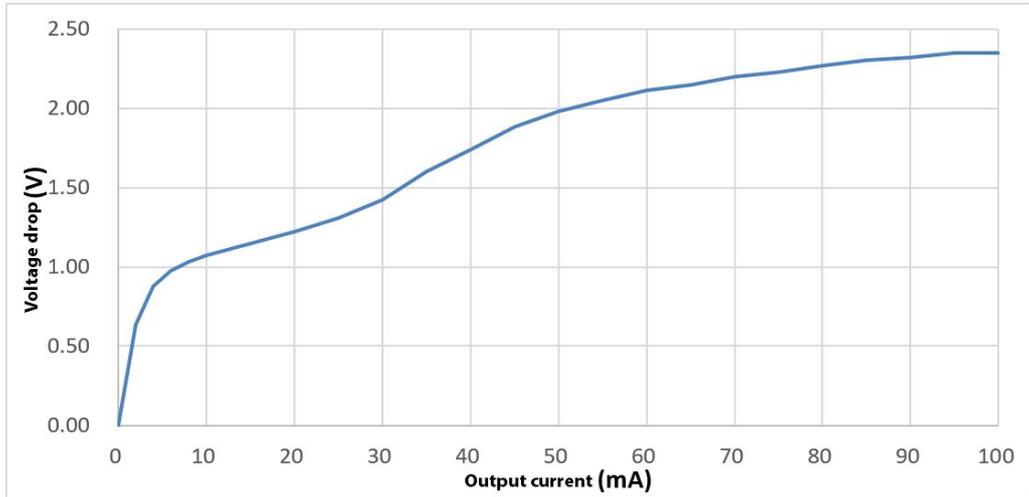


Figure 2-5 Optocoupler output characteristic curve



- The maximum voltage drop at the optocoupler output port is 2.35 V (measured at the maximum output current of 100mA).
- The values above are typical values measured at an ambient temperature of 25 degree Celsius, and there are individual differences between different cameras.

2.3 I/O external wiring

2.3.1 Opto-isolated Input

Optocoupler isolation input supports NPN/PNP/push structure output sensors.

2.3.1.1 NPN output sensor

Method 1: No pull-up resistance is added (recommended).

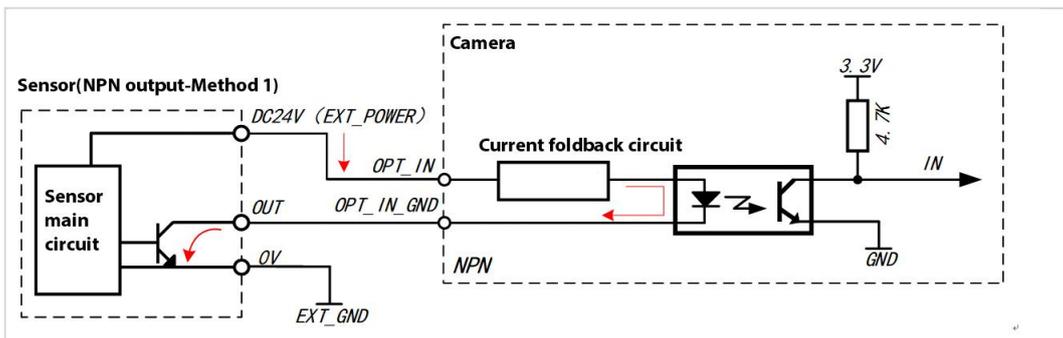


Figure 2-6 NPN connection mode 1

Method 2: Add a pull-up resistor.

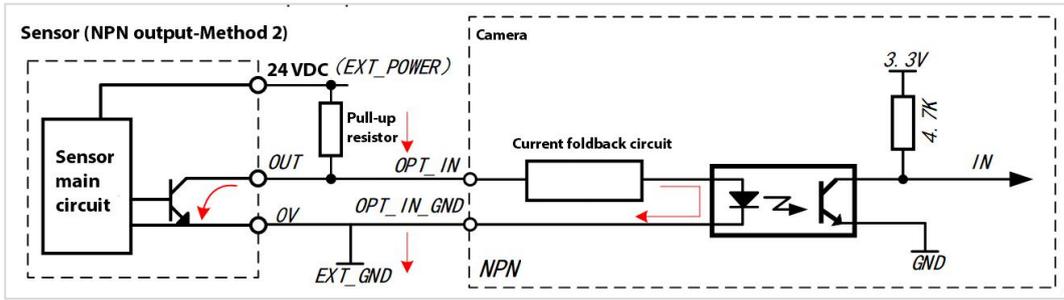


Figure 2-7 NPN connection mode 2



- EXT_POWER refers to the positive of the user's external power supply, EXT_GND refers to the user's external power supply, which can be a separate switching power supply or a sensor power supply.
- This connection mode is applicable to sensors with NPN open-set output structure.
- Recommended value of pull-up resistance: 1kΩ during 3.3V power supply, 1kΩ during 5V power supply, 2.4kΩ during 12V power supply, 4.7kΩ during 24V power supply. When it is necessary to improve the output current capability, the resistance can be less than 1kΩ, but the rated power of more than 1W is required.
- In some models, OPT_IN_GND is shared with OPT_OUT_GND and its name is OPT_GND.

2.3.1.2 PNP Output Sensor

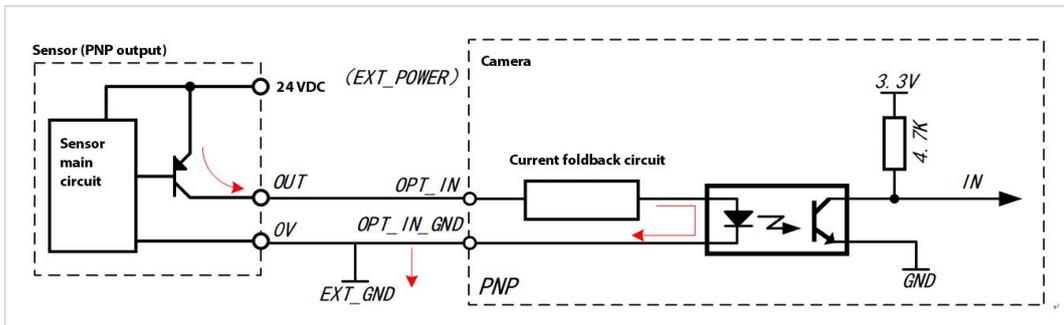


Figure 2-8 PNP connection mode

2.3.1.3 Sensor of TTL output or push output

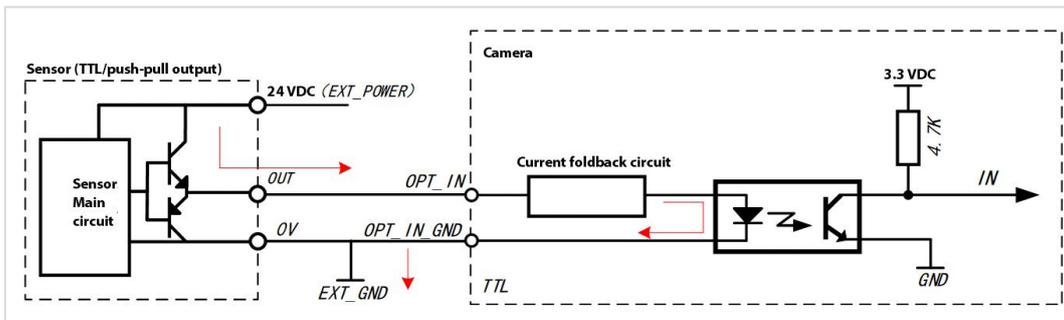


Figure 2-9 TTL/push-up connection mode

2.3.2 Opto-isolated Output

The transistor output of camera is separated from the internal loop by an opto-isolator. Therefore the transistor output can be used as NPN output or PNP output.

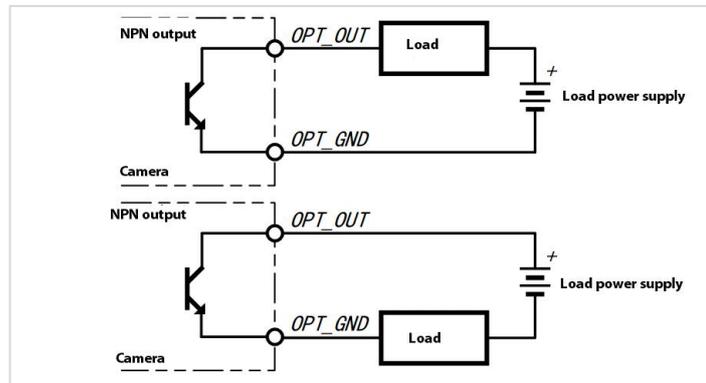


Figure 2-10 Optocoupler output topology

2.3.2.2 Code reader as NPN output

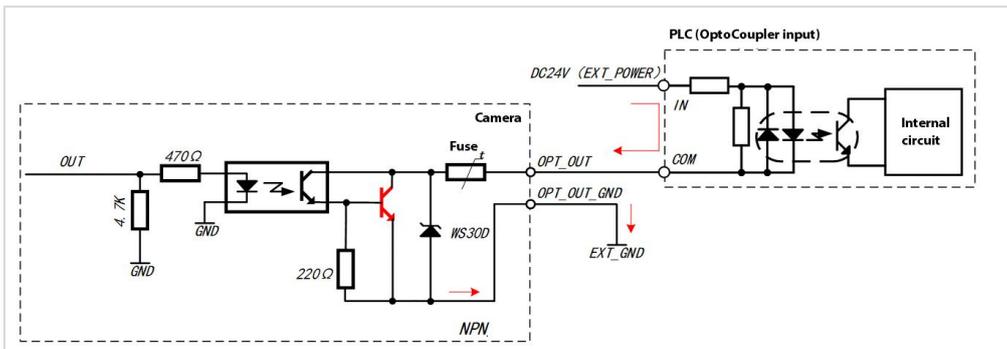


Figure 2-11 NPN output connection mode

2.3.2.3 GPIO is used as an output port

When GPIO is used as output, it is similar to optocoupler output. The two mainly depend on that GPIO is a non-isolated wiring mode, and GPIO signal ground is shared with camera power ground.

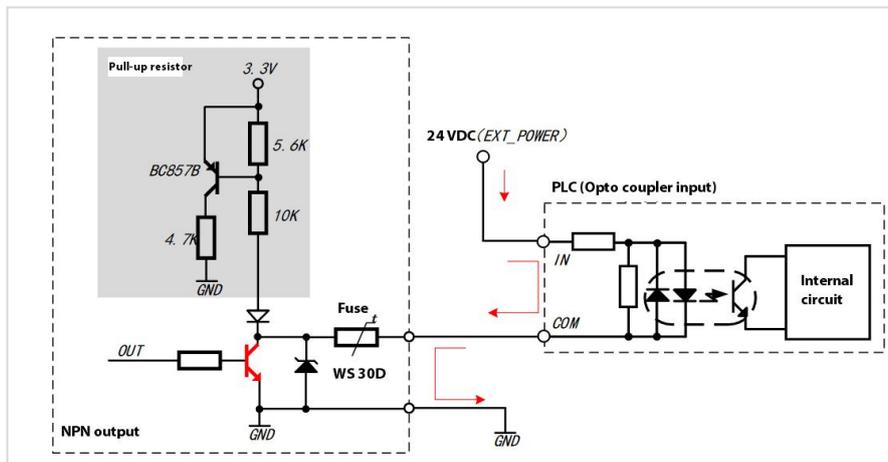


Figure 2-12 GPIO output connection mode



- Please do not apply voltage that exceeds the maximum switching capacity to the output terminal or connect a load.
- You cannot change the interface fuse. Please contact after-sales service after the fuse is broken due to overcurrent such as short circuit.
- GPIO is a two-way interface, and the correct direction (input or output) must be set before connecting the external circuit. Once the correct direction is set, please do not change it during camera operation. The wrong direction is set to damage the GPIO interface circuit.
- GPIO interface is non-isolated design and has poor anti-interference performance. Please do not use it in occasions with serious electrical interference. We recommend that you use the input/output interface with optocoupler isolation first.
- As shown in the typical circuit, if the external pull-up resistor is used, the recommended value of the pull-up resistor: 1kΩ at 3.3V power supply, 1kΩ at 5V power supply, 2.4kΩ at 12V power supply, 4.7kΩ at 24V power supply. When it is necessary to improve the output current capability, the resistance can be selected below 1kΩ, but the rated power of more than 1W is required.

2.3.2.4 Inductive load wiring method such as relay

Use the camera output to drive the inductive load (such as relay), the relay model of the built-in continuous current diode must be used, or the continuous current diode should be added externally), otherwise, the output interface will be damaged due to overvoltage.

The following figure shows an example of a suppression circuit with inductive load. In most applications, it is enough to use additional diode A, but the closing speed is required to be faster in the application. It is recommended to add voltage limiter B. Ensure that the voltage limiter can meet the current requirements of the output circuit.

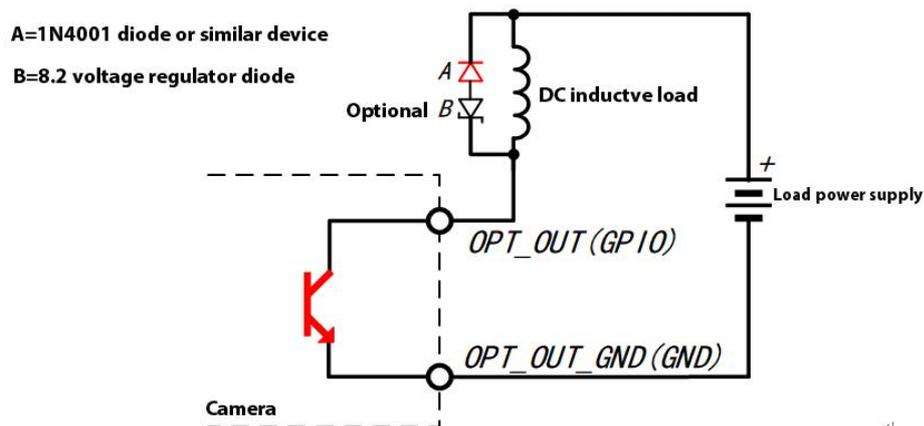


Figure 2-13 Inductive load wiring method

2.4 How to avoid EMI and ESD?

The camera is installed on the industrial site, and there are some equipment that produce EMI (electromagnetic interference). The camera itself is easy to be affected by ESD (static discharge). Serious EMI

and ESD interference will cause false triggering, sudden stop of flow collection and other faults. EMI and ESD can also adversely affect the imaging quality of cameras and affect the reliability of data transmission between cameras and PCs.

In order to avoid the problems mentioned above caused by EMI and ESD, customers are recommended to take the following precautions:

(1) use high-quality shielded cables. These cables can have a good shielding effect on EMI and ESD;

(2) Choose a cable with right length. Do not coil the excessive camera cable into a loop. If the cable is really excessively long, bend it back and forth instead of coiling into a loop.

(3) The power cord of the camera is routed in parallel with data cable;

(4) Do not route the camera cable in parallel with other high current and voltage switching cables (such as stepper motor drive and solenoid valve); Do not place the camera cable near the interference sources mentioned above;

(5) It is recommended to connect all the ground (GND) to one point and use single point grounding. For example, you can use the wiring board to connect the ground of the whole system to one point and then lead out. This is to avoid large area ground circuit (large area ground circuit is the main cause of EMI problem).

(6) Use a line filter for the main power supply of the camera, or use a separate power supply;

(7) Install the camera and cables as far away from spark generating equipment as possible, such as brush motor and relay. A metal shielding enclosure can be additionally used if necessary;

(8) The following measures can be taken to reduce the risk of ESD:

(8.1) The mounting surface is made of conductive material;

(8.2) The humidity in the installation environment is properly controlled. Dry air is easy to produce ESD;

3 Installation

3.1 Precautions for camera installation

During installation, static electricity, electromagnetic interference, lightning strike and surge should be considered as well as the heat dissipation of the camera.

3.1.1 Security protection conditions

Although the camera has lightning protection, surge protection, EMI (electromagnetic interference) and ESD (static electricity) protection designs inside, from the perspective of safety, these effects should be avoided or reduced from the installation environment and installation method.

The following are the basic protection methods. Please refer to and use them as much as possible.

- Use SFTP to shield the network cable. Under the condition of meeting the use requirements, do not require the flexibility of the network cable too high, because many network cables in order to achieve good softness, the thickness of copper wire, the thickness of shielded aluminum resin, the density of shielded mesh, the protection performance of PVC permeable and other aspects are all folded.
- The network cable should be as short as possible. If the network cable is too long and there is a lot of residue, it should be carn-shaped wiring, and do not circle the network cable, which can reduce the coupling of electromagnetic interference.
- The power line can use shielded wires, and the circle should also be avoided. The power line and network cable can go together without winding together.
- The power line and network cable should be kept away from the equipment with high current, high voltage and frequent on and off, such as stepper motor, etc., especially not connected with the cable of this kind of equipment. This kind of equipment has strong electromagnetic radiation and is easy to be coupled to the transmission line of the camera.
- All equipment's protective ground should be connected together, and then single point should be connected to the protective ground to avoid multi-point grounding. Multi-point grounding is easy to cause voltage difference between different equipment and form a circuit, which is easy to be coupled with electromagnetic interference.
- The AC power supply terminal of the switching power supply that supplies power to the camera and

the power supply of the PC should come from the same AC plug, so that their protective ground can be connected together to avoid multi-point grounding. Do not directly use this AC power supply for high-power electromechanical equipment.

- magnetic rings can be added to the power control line of the camera to absorb electromagnetic interference signals.
- Ensure a certain environmental humidity, with electrostatic bracelet during operation, wearing anti-static clothes and shoes, etc., can reduce ESD generation.

3.1.2 Heat dissipation

The environment requirements of the code reader are as follows.

- Temperature and humidity.
 - ✧ The ambient temperature cannot exceed 50 °C, and it is best to for the camera to work in an air-conditioned environment.
 - ✧ Ambient humidity when the camera is working: 20%–80%, non-condensing.
 - ✧ Storage temperature: –30 °C to +80 °C.
 - ✧ Storage humidity: 20%–80%. non-condensing.
- Do not roll the long camera cable into a circle, please bend it back and forth to ensure EMI performance.
- During transportation and assembly, be careful not to bump into the button to prevent the cover plate from being damaged.

3.2 Installation

3.2.1 Packing list

When opening the outer packing box, please check whether the equipment is obviously damaged, and confirm whether the list of random accessories is consistent, see Table 1-1 for details.

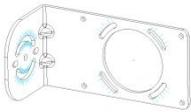
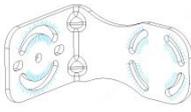
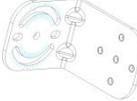
Table3-1 Part List

Part List		
1	Code Reader	1
2	M4 × 10 cross groove screw	4

3.2.2 Installation

For the normal use of the equipment, please prepare the supporting items in Table 1-3 before installation.

Table3-2 Recommended supporting materials

No.	Accessory	Diagram	Quantity	Note
1	Intelligent Code Reader		1	Equipment referred to in this manual
2	Power supply and I/O interface cable		1	Purchase separately
3	Ethernet cable		1	Purchase separately
4	Switching power or power adapter		1	Select the appropriate power adapter or switching power according to the power supply and power consumption of the equipment. For specific parameters, please refer to the technical specification of the corresponding model of equipment, which needs to be purchased separately.
5	Fix the bracket.	Bottom mounting bracket 	1	Used for fixing equipment, the installation effect is shown in Figure 3-1, which needs to be purchased separately
		Front mounting bracket 	1	Used for fixing equipment, the installation effect is shown in Figure 3-2, which needs to be purchased separately
6	Adaptive Bracket		1	It is used for fixing equipment, and the combination use of fixing bracket can realize multi-angle adjustment of the fixed mode of code reader.

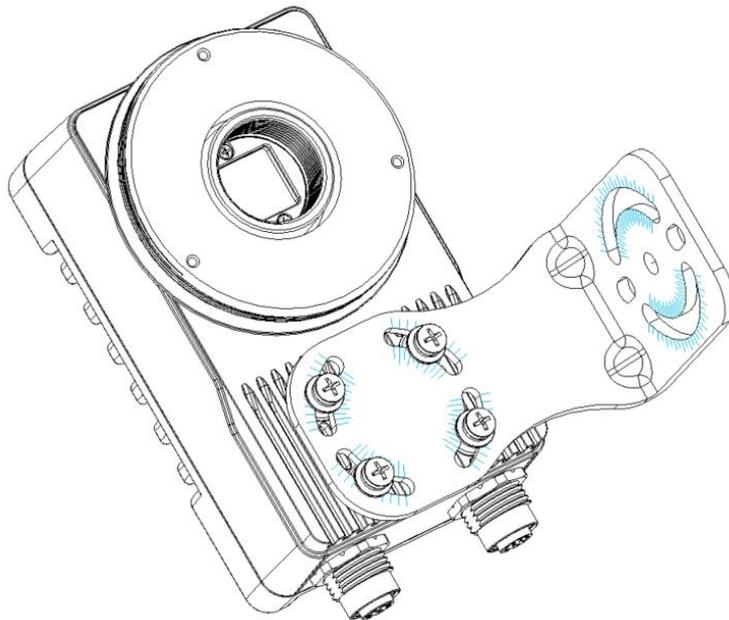


Figure 3-2 Schematic diagram of front mounting bracket

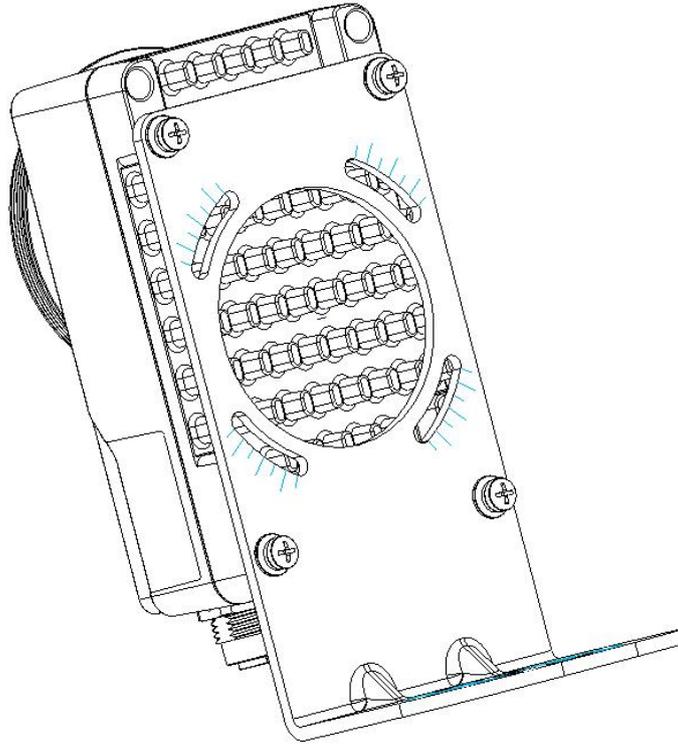


Figure 3-3 Back installation diagram

3.3 Network settings of computer

Select Control Panel > Network and Internet > Network and Sharing Center > Change Adapter Configuration. Select the corresponding network port and right-click Properties. The following dialog box is displayed:

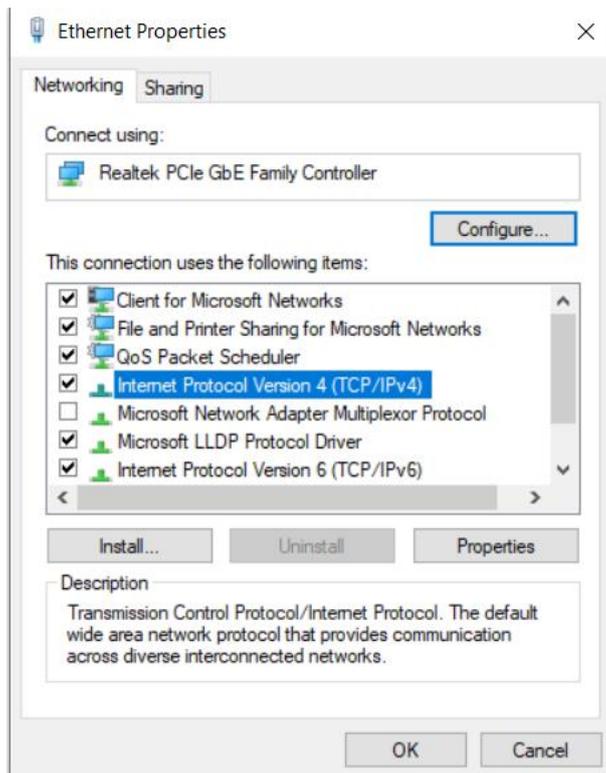


Figure 3-4 Configure network properties

Double-click Internet Protocol Version 4 in the red box in the figure. The IP address setting page is displayed. Configure the network port to automatically obtain an IP address or a static IP address, as shown in the following figure. Make sure that PC and the device are on the same network (LAN)

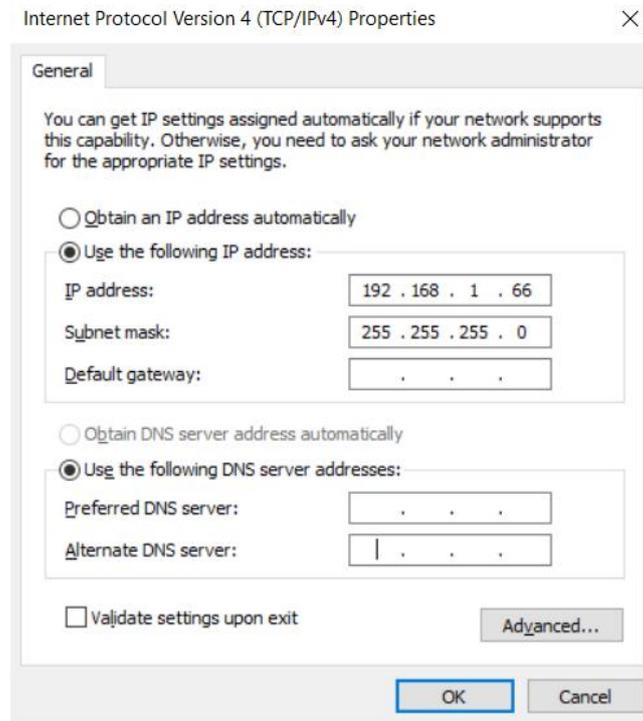


Figure 3-5 Network Card Configuration of Windows

3.4 Installing Client

You can debug and configure parameters through East ID client. EasyID client can be installed on Windows 7/10 32/64bit operating system.



Installation Package acquiring path:

- Contact technical support to obtain the installation package.
- Enter the official website of Huarui (www.irayple.com), choose "Service Support" -> "Download Center" -> "Machine Vision" -> "Software" to obtain the download link.

Find the path of EasyID installation package on the desktop of Windows, double-click to run the program EasyID_vX.X.XX_XXXXXXXXX.exe or right-click to open it, and then enter the installation page of EasyID.

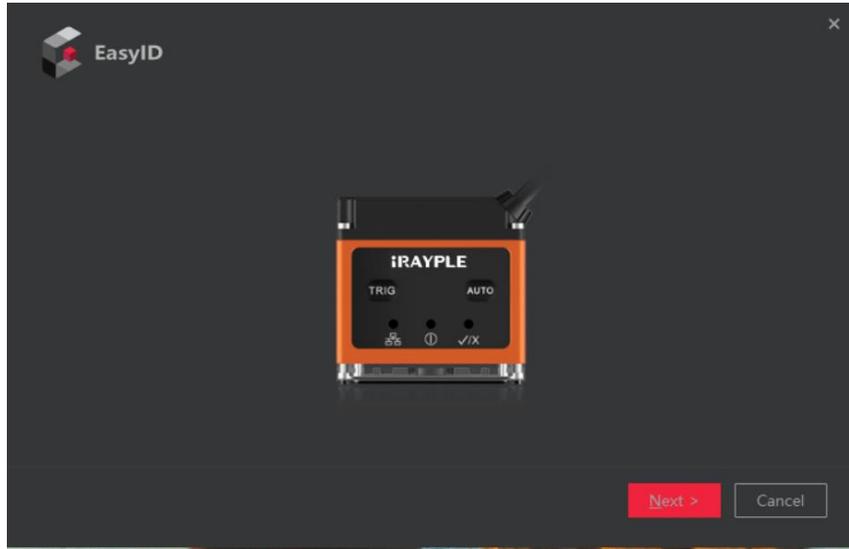


Figure 3-6 EasyID Installation page

Click Next, and then select the driver based on the device type. Click , and then select the installation location based on your habits and the hard disk space on your computer.

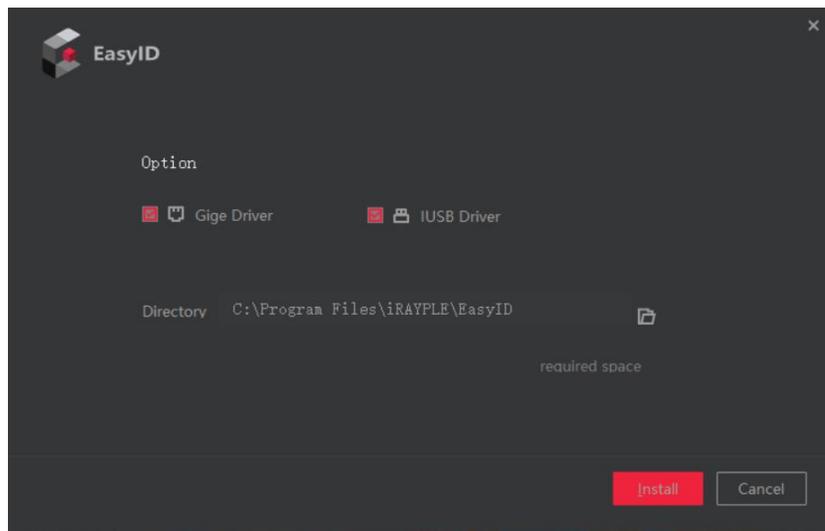


Figure 3-7 Drive and installation path selection

Click "Install" to proceed to the next step and wait patiently for the software to be automatically installed.

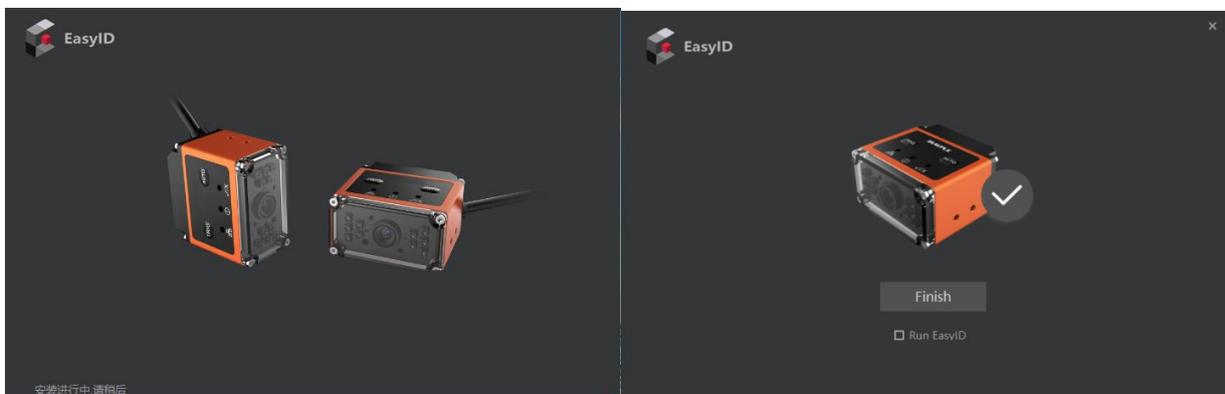


Figure 3-8 Client installation page

After selecting Run Easy ID, click Finish. After the installation finished, the software runs automatically.

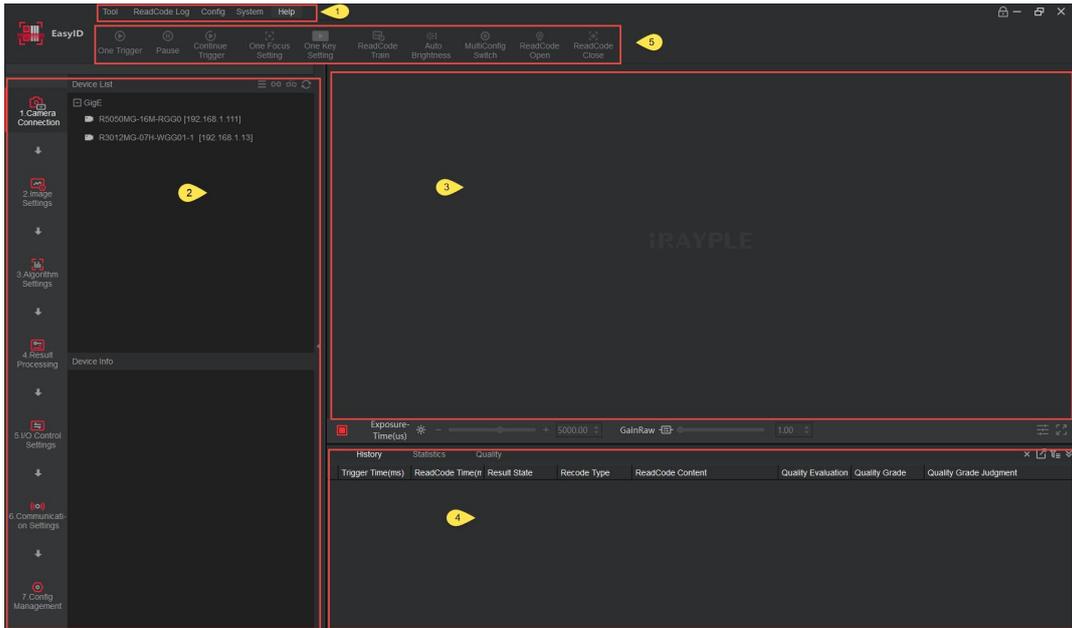


Figure 3-9 Homepage

Table3-3 Client Introduction

No.	Name	Description
1	Menu Bar	Frequently used table, including tools, logs, configuration, system and help
2	Parameter Configuration Area	The main operation area of the client is used for detailed parameter configuration of the reader, including image configuration, algorithm configuration, result processing, input/output configuration, communication configuration, configuration management, etc
3	Image area	The reader pulls the display area of the picture, while configuring the most commonly used configuration items and displaying some device pull information, such as the number of received pictures, network transmission speed, frame rate, image gray level, resolution, etc
4	Result area	Display real-time decoding information, statistics information and code quality information of the reader.
5	Quick Toolbar	Commonly used shortcut keys, including trigger, one - key training, automatic brightness, visual mode switch.

3.5 Connecting Camera

➤ Connect the code reader, ensure that the power supply and network work normally and then open the EasyID software, and then you can find the camera in the device list

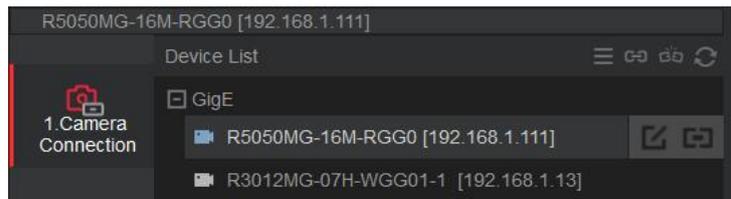


Figure 3-10 Device List



- Device list will display camera in the same network segment with the PC. When new devices are connected to the network, click  to refresh the list.
- Click  to enter the IP configuration page. Ensure that the IP address of the device and the industrial personal computer are on the same network segment.

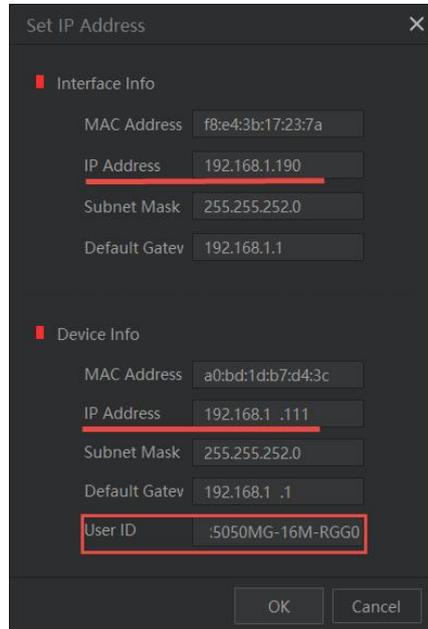


Figure 3-11 Reader IP Configuration Figure



- You can set a special name for the device. The value can contain up to 16 bytes in English, Chinese, and special characters.
- Click  on the right of the device list or double click the device in the device list to connect devices. After successfully connect, the device status as shown in the following figure..

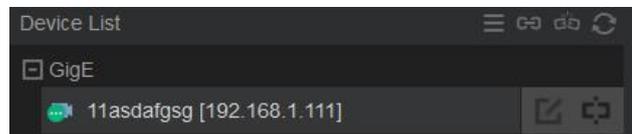


Figure 3-12 Code Reader connected successfully

3.6 Web Client Operations

3.6.1 Basic Functions

After the camera is connected, move the mouse to the image area on the right, select "Free Stream" , and then click the Play button  to enter the pull stream page.

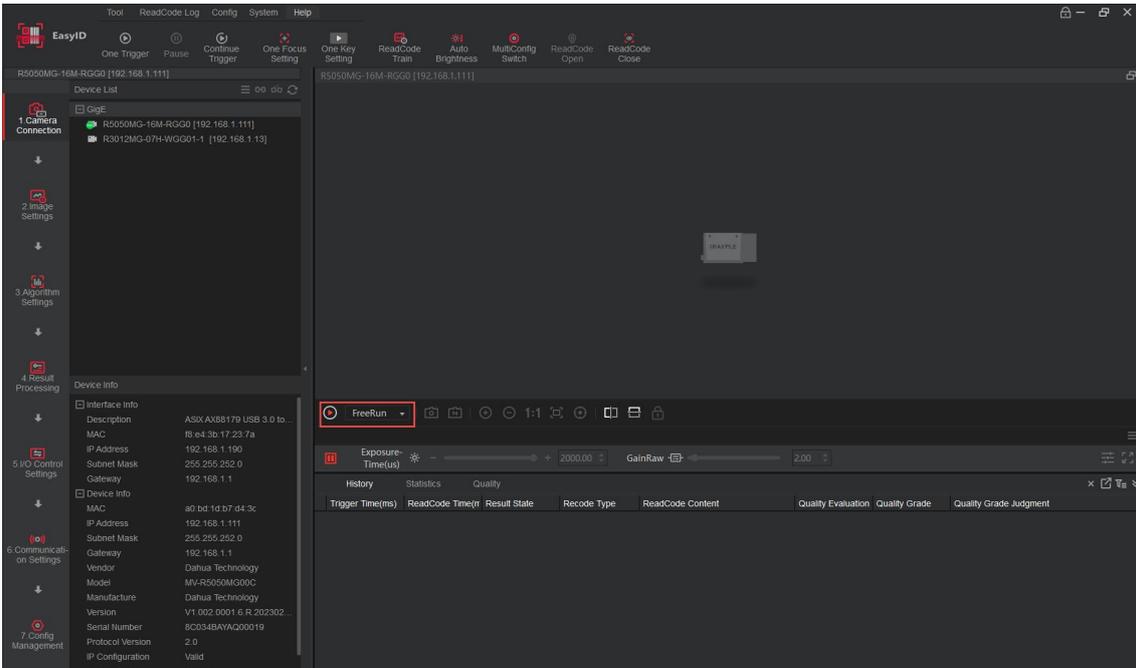


Figure 3-13 Client Page

Place 1D/QR codes in appropriate places within the reader's field of vision to ensure that the image is not too blurry. At this time, since the decoding function is enabled by default, the device will automatically decode and display the results in real time in the screen. Meanwhile, the decoding result information will be updated synchronously in real time in the history list below, including decoding time, time consuming, bar code category, code content and so on.

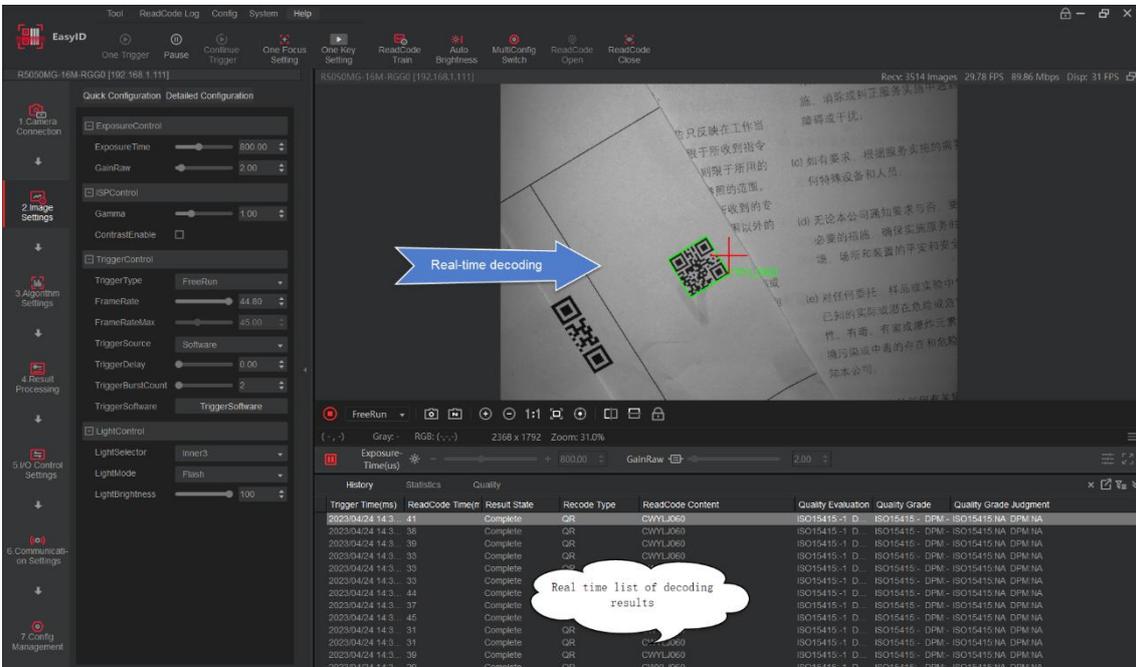


Figure 3-14 Real-time Decoding page

3.6.1.2 Image display introduction

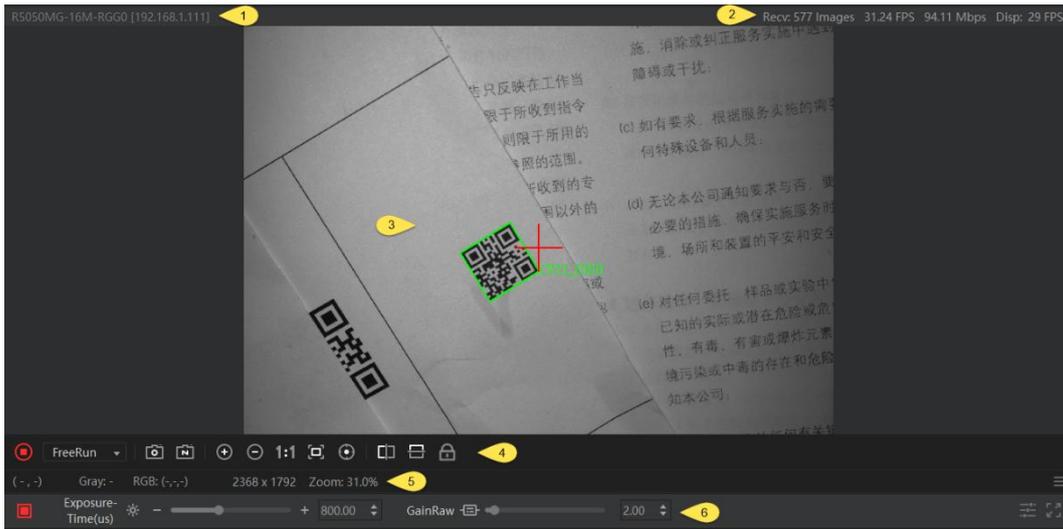


Figure 3-15 Image display area

Table3-4 Description

No.	Name	Icon/But ton	Description
1	Basic Information	-	Display the model and IP address of the reader that are connecting
2	Real-time information	/	Display the number of pictures, frame rate, bandwidth and more.
			Switch windows. Supports connecting multiple cameras. Supports up to 4 × 4 windows.
3	Pull stream display area	/	Display pull stream of the camera. If the code reading mode is enabled and the code is recognized, the code identified will be selected in the form of a green box and its code value will be displayed; Hover the mouse to any part of the image and scroll the mouse wheel to zoom in or out to a picture.
4	Operation buttons		Play. Click it to enable stream pulling of the reader
			Trigger mode drop-down menu: including free pull, single frame trigger, multi-frame trigger, level trigger *1
			Single snapshot. Click to capture the image
			Click the button, and then keep capturing the image and save it to the defined path. Select System > Image Saving to configure the image saving path.
			Click it to zoom in image
			Click it to zoom out image
			Click it, and then the image will be displayed in 1 : 1 format.
			Click it to restore the full view mode.
			Click it, and then the center of the reader's field of view will be adjusted to the center of the view
			X flip: the image after the point is flipped on the X axis
	Y flip: the image after the point is flipped with the Y axis		

			Algorithm ROI area lock: After locked, the ROI area cannot be changed and dragged. After unlocking, the ROI box can be dragged and adjusted.
5	Image messages	/	Click the button on the right  , You can select the mouse position, gray values, RGB values, resolution and zoom ratio in the pop-up window and follow the mouse position on the left to display in real-time.
6	Shortcut bar		Supports the most frequently used easy operations: exposure and gain.



- Only when the video is paused, can you switch FreeRun, SingleFrame, MultiFrame, PhaseMode mode in the drop-down menu.

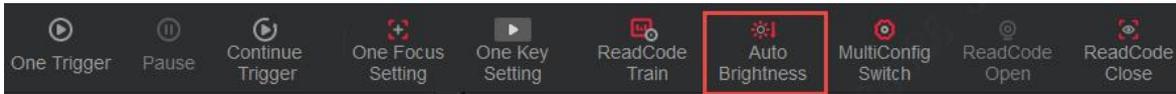
3.6.1.3 Quick Operations of image

- If the Screen is too bright or too dark:

You can quickly adjust the image effect through Exposure and Gain at the bottom of the picture.



You can also adjust picture automatically by clicking "Auto Brightness" in the "Shortcut bar" above the software.



3.6.2 Viewing Device Information

Select the name of the device, and then view the basic information including IP address, model, manufacturer, and firmware version, SN and more under the Device Info.

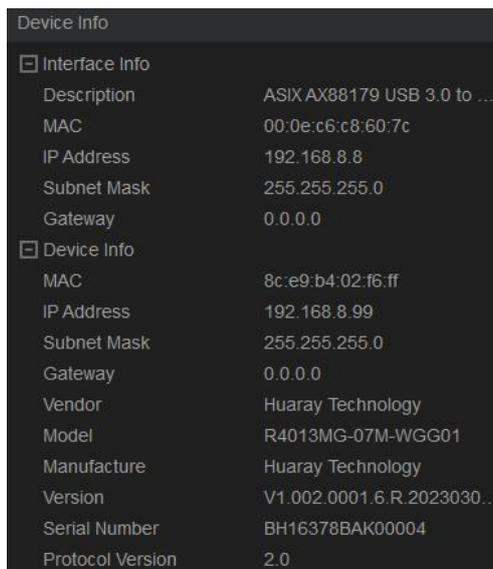


Figure 3-16 Device information



- If an abnormal device needs to be checked by the vendor, you need to provide information, such as Model, Firmware Version, and SN, to the relevant sales or technical support personnel.

4 Operation settings

4.1 Config List

4.1.1 Image setup

Click image configuration to set the exposure, ISP, trigger parameters, fill light, etc. of the camera on the details page;

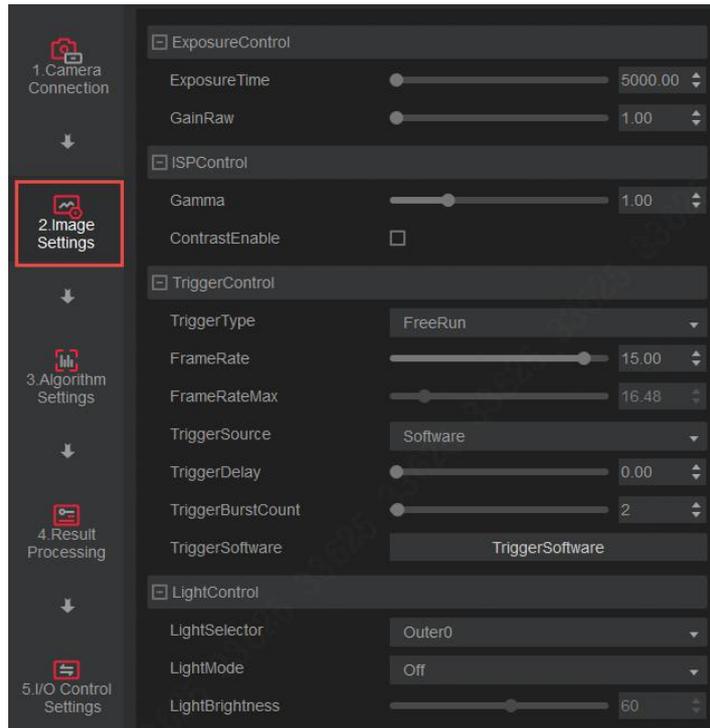


Figure 4-1 Image configuration parameters page

Table4-1 Image setting parameters description

Parameter		Range/Option	Note
Configuring exposure	Exposure time*	In unit of μs .	Increasing the exposure time can improve the brightness of the image, but it will reduce the frame collection rate to a certain extent, and drag-down is easy to occur when shooting moving objects.
	Gain	1-23	Increasing the gain can improve the brightness of the image, but it will increase the image noise to a certain extent.
ISP Configuration	Gamma	0-4	The larger the value, the more obvious the black and white contrast of the image.
	Contrast Enable	Y/N	Gou Xuan, the function takes effect. After the function is enabled, the default value is 80.
Light Control	Light source selection *	Outer0/outer1/outer2	When the device is connected to an external fill light, this function can be used to control the light on, off, and strobe of the external fill light.

Parameter	Range/Option	Note	
Brightness	10–100/10–20	In Flash mode, the brightness range is 10–100; in Solid On mode, the range is 10–20.	
Trigger Control	Trigger Mode	Free/Single Frame/Multiframe/Level	4 trigger modes are available, including free, single frame, multiframe, and level modes.
	Frame rate	0.5–maximum value	The frame rate range might be different depending on the device models.
	Frame Rate Max	–	Displays the maximum frame rate supported by the current configuration and cannot be operated. *The maximum frame rate decreases accordingly when the exposure is high.
	Trigger Source	Software trigger/Line0/Line2	Software trigger refers to communication or command trigger; Line0 and Line2 are triggered by external input signals respectively.
	Trigger Delay	0-1000000, in us	Trigger delay time.
	Trigger Burst Count	1-255	It refers to the maximum number of frames that can be captured by one trigger, which is valid in multiframe mode.
	soft trigger	–	It is only valid in single-frame or multi-frame trigger mode. Click to simulate the software to trigger once.
Light Mode	Off/Always/Flash/Phase	Off: Turn off the fill light Always: The fill light remains on Flash: fill light strobe (strobe frequency depends on camera exposure time) Phase: Used in conjunction with camera IO trigger mode, the trigger is always on	



- In order to ensure that the power consumption of the whole machine is in a good working range, the exposure value has a certain correlation with the brightness of the internal fill light of the equipment. If the brightness of the internal fill light is set high, the maximum exposure value will be limited to a certain range, subject to the specific camera model.
- Too high exposure value will affect the frame rate of the camera; If you need a higher frame rate while ensuring the brightness of the image, it is recommended to adjust the gain, gamma, brightness of the fill light and other parameters appropriately through synchronization to achieve better effect.

4.1.2 Algorithm Settings

Supports the configuration of various algorithm parameters of the Reader, which is mainly divided into three configuration parts: quick settings, detailed configuration and quality evaluation.

4.1.2.1 Quick settings

As shown in the figure below.

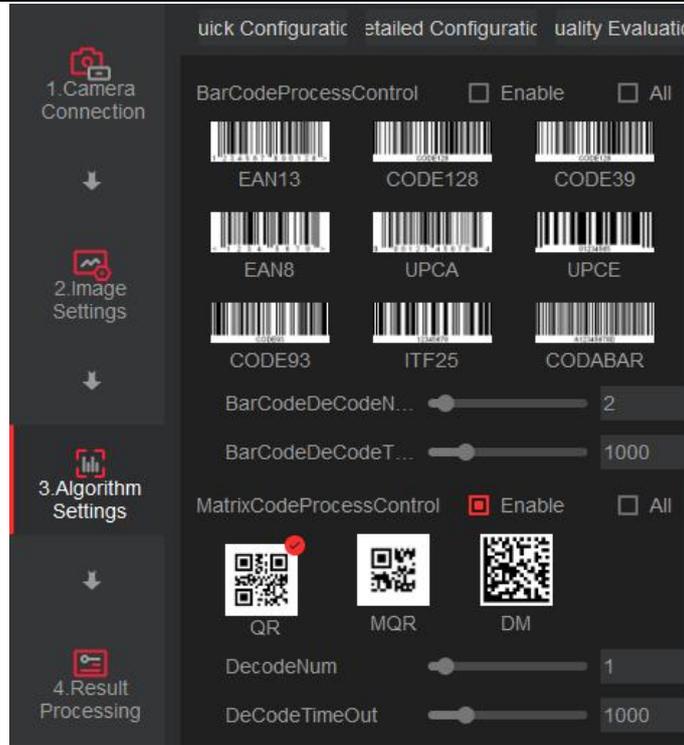


Figure 4-2 Algorithm Configuration

Table4-2 parameters list of algorithm Configuration

Parameters		Range or Options	Description
Barcode configuration	Enable	Y/N	The QR code recognition function can be enabled after selection
	Code type	/	You can select multiple Barcode types of barcode, including Optional : EAN13, CODE128, CODE39, EAN8, UPCA, UPCE, CODE93, ITF25, and CODABAR.* 1
	Maximum Decode Number	0-8	Maximum number of decoded frames
	Timeout Duration	0-5000, unit:us	The value is 200 by default. You need to adjust the time if the identification takes a long time due to the special environment.
QR code configuration	Enable	Y/N	Select the check box to enable QR Code recognition function.
	Code type	/	Configuring the type of the QR code, supports single or multiple choice. The optional types: QR/MQR/DM*2.
	Maximum Decode Number	0-5	Maximum number of decoded frames
	Timeout Duration	0-5000, unit:us	The value is 500 by default. You need to adjust the time if the identification takes a long time due to the special environment.



- One dimensional code types: Code 39, Code 93, Code128, CodaBar, EAN8, EAN13, UPCA, UPCE, ITF25, 2 of 5 (Industrial 2 of 5) standard25, GS1-128. Due to restrictions, only part of EasyID can be displayed. If you need special categories, please contact sales or technical support for customized authority.
- QR code supports: QR, Data, Matrix, Micro QR, GS1 DM, GS1 QR. Due to restrictions, only part of EasyID can be displayed. If you need special categories, please contact sales or technical support for

customized authority.

If the barcode is identified successfully, you can view the real-time decoding effect on the right page of the client (select the identified code in the green box and display the code content), and view the identified decoding information, including trigger time, time consumption, status, category, data and quality evaluation, in historical record.

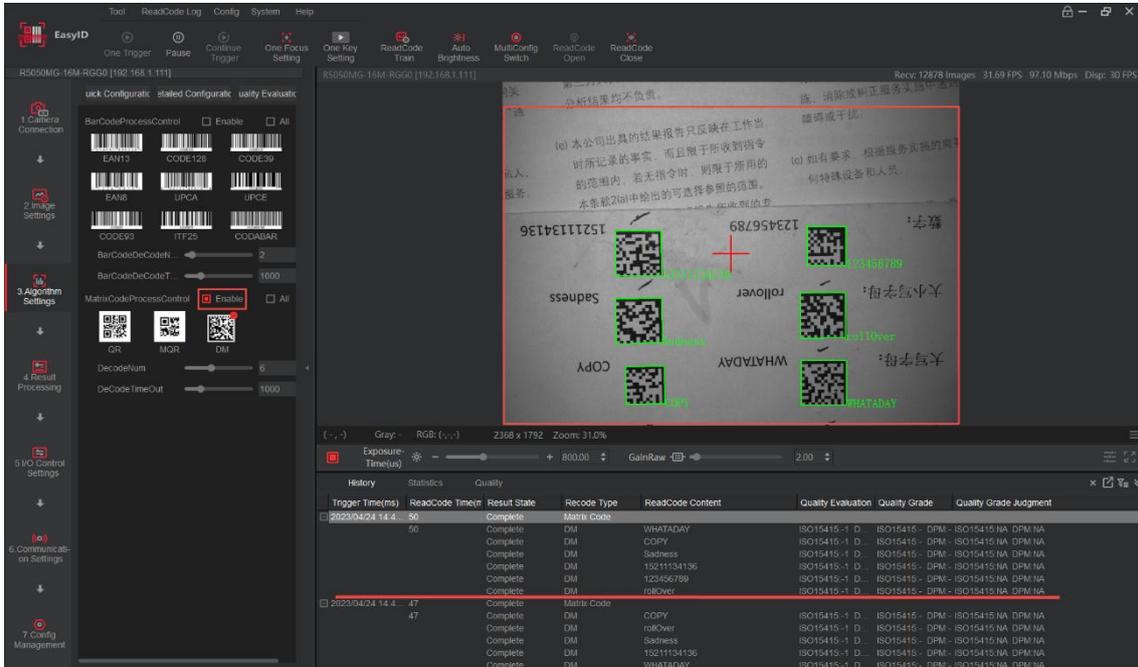


Figure 4-3 Decode successfully

4.1.2.2 Detailed configuration of algorithm.

The detailed configuration page contain three parts,

A、Detailed configuration

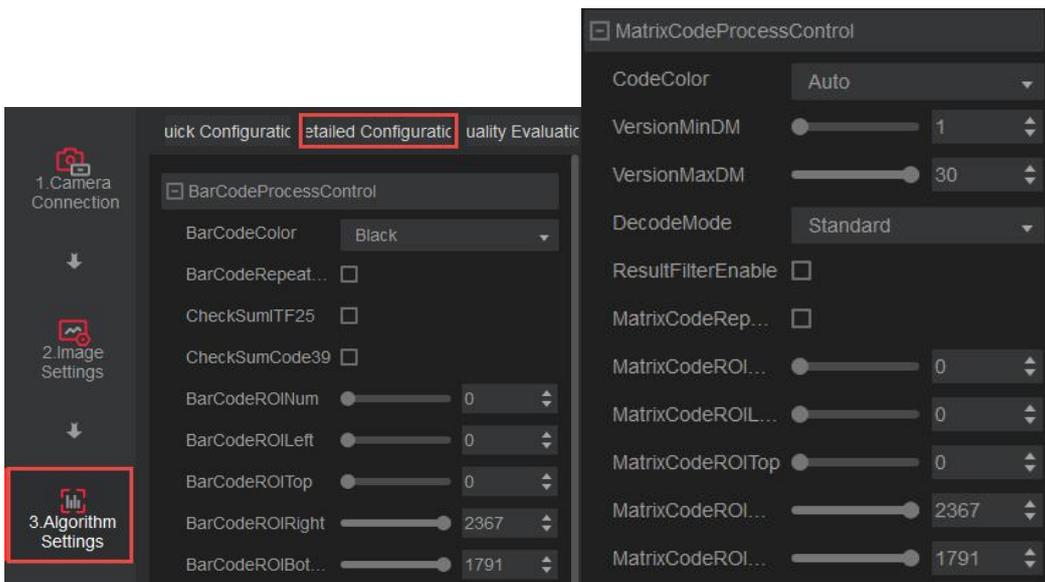


Figure 4-4 Detailed configuration

Table4-3 Parameter Description

Parameter		Range or Options	Description
Barcode configuration	Barcode Enable	Y/N	On/Off, Enable or disable one-dimensional barcode.
	Maximum Decode Number	0-32	The maximum number of barcode reads varies by model
	Decode Timeout	0-5000, unit:us	Barcode read timeout period. If it exceeds the timeout period, the read ends
	Polarity	Auto/Black/White	Auto is preferred. It supports both black code and white code
	Bar Code Repeated Filter Enable	Y/N	On/Off. Enable or disable the repeated bar code filtering function.
	ITF25 parity	Y/N	On/Off, Enable or disable ITF25 verify function.
	Code 39 parity	Y/N	On/Off, Enable or disable Code 39 verify function.
	Bar Code ROI Num	0-1	Bar Code ROI Num
	QR Code ROI Left/Top/Right/Bottom	Max Resolution	You can draw the ROI area based on the four corner coordinate values of one-dimensional ROI as shown in Figure 4-10. Note that this function is different from the multi-ROI (Figure 4-11).
QR Code Config	QR code configuration	Y/N	Enable or disable this function.
	Polarity	Auto/Black/White	Auto is preferred. It supports both black code and white code
	Version Min QR	1-30	Minimum value of QR code version range
	Version Max QR	1-30	Maximum value of QR code version range.-QR code supports max version is 40
	Maximum Decode Number	0-16	The maximum number of QR codes to be read. It might be different depending on device models.
	Decode Timeout	0-5000, unit:us	QR code reading timeout time. If it times out, the code reading will end.
	Decode Mode	Standard/Medium/Difficult	The capabilities and time-consuming of the three modes are gradually increased, and the standard mode is preferred.
	Result Filter Enable	Y/N	Enable or disable result filtering function. The device can filter results by code length and regular expression.
	Code Repeated Filter Enable	Y/N	On/Off. Enable or disable the repeated bar code filtering function.
	The number of QR code ROI	0-1	The number of QR code ROI
QR Code ROI Left/Top/Right/Bottom	Max Resolution	You can draw the ROI area based on the four corner coordinate values of QR code ROI as shown in Figure 4-10. Note that this function is different from the multi-ROI (Figure 4-11).	

B、Image Pre-processing

Due to the influence of the material of the object, the inherent characteristics of the detection target, the type of light source, the external environment and other factors, the image acquired by the camera may not meet the requirements of efficient and stable reading detection. You can pre-process the original image to improve the image effect and enhance the reading efficiency. Preprocessing configuration

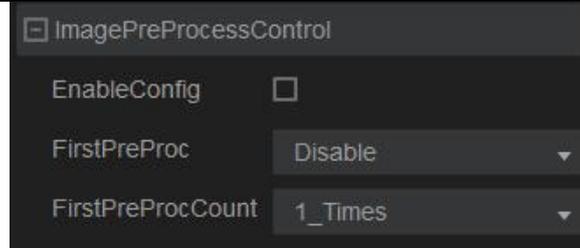


Figure 4-5 Image pre-processing setup

Table4-4 Description of image Process parameters

Parameters		Range or Options	Description
Image Pre-processing	Enable switch	Y/N	Select the check box to enable the processing function ^{*1} . Select Image output settings > JPEG image compression enable > not enabled, and then you can view the effect of image pre-processing.
	First preprocessing	/	For codes in special environment, the following appropriate preprocessing algorithms can be selected for processing to achieve better recognition effect, optionally: Disable, mean filtering, median filtering, corrosion, expansion, open operation, close operation, Sharpening, reverse color, corrosion 3x1, expansion 3x1, corrosion 1x3, expansion 1x3. * 2
	The number of preprocessing	1-6	Preprocessing times can be used 1-6 times for processing, the more times, the more obvious the effect achieved

Select Image output settings > JPEG image compression enable > not enabled, and then you can view the effect of image pre-processing.

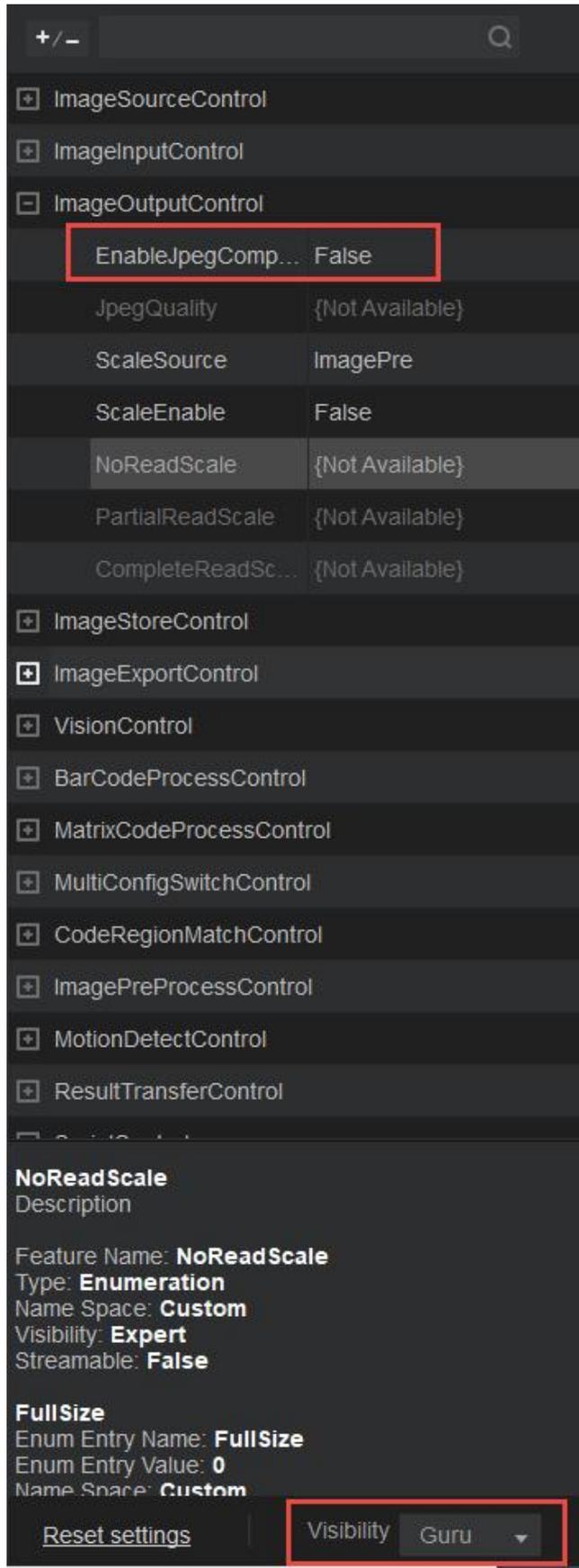
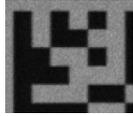
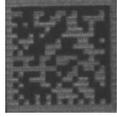
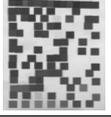
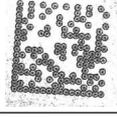
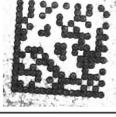
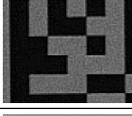
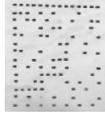
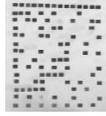
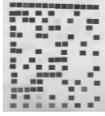


Figure 4-6 Parameters of image output configuration

The pre-treatment effect is explained in the table below:

Table4-5 Effect

Type	Function		Before preprocessing	After preprocessing
Median filter	Noise suppression, Black and white point noise is removed and module boundary sharpness is retained			
Mean filter	Blur image, remove the noise in the code to make the module inside.			
Corrosion	The black block gets bigger			
Expansion	The white block gets bigger			
Opening operation	Remove white interference in the module and maintain the proportion of black and white block size			
Closing operation	Remove the black interference in the module and maintain the proportion of black and white block size			
Sharpening	Deblurring, sharp and obvious module boundary			
Inverse color	Inverse color of black and white			
Specific direction expansion corrosion: horizontal * vertical	Referred to expansion corrosion, which acts in a single direction			
Corrosion 3 times				
	Original Image	Once	2 Time(s)	3 Time(s)

C、Algorithm ROI Settings

Algorithm ROI: Two ROI methods to set up.

Method 1: Use coordinate values to set the ROI region

- Confirm the code type to be identified
- Set the "ROI Number" to 1 according to "Detailed Parameter Description of Algorithm"
- Enter the corresponding values respectively in the lower "ROI left/up/right/down boundary coordinates", and you can see the corresponding recognition effect in the right image display area.

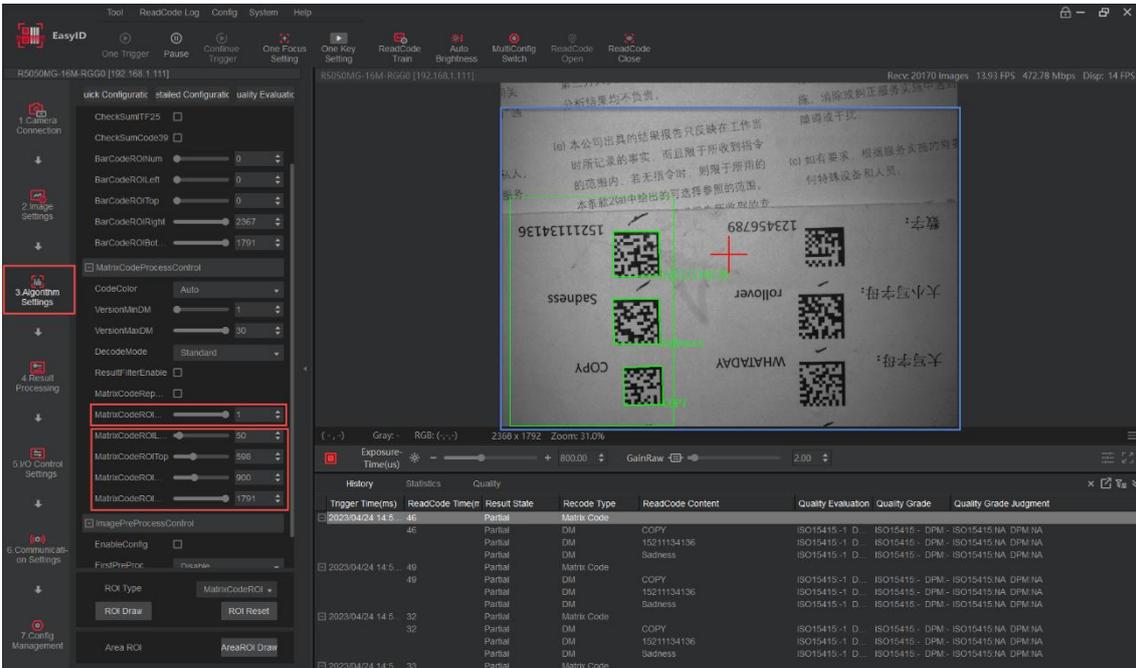


Figure 4-7 Setting algorithm ROI through coordinates

Method 2: draw ROI regions.

- Select the ROI type: bar code ROI/QR code ROI
- Click ROI drawing, and then press and hold the left mouse button in the pop-up window to select the appropriate area to draw the ROI box. If the drawing area does not meet the requirements, drag the mouse to select the frame. After drawing, click **Save**.

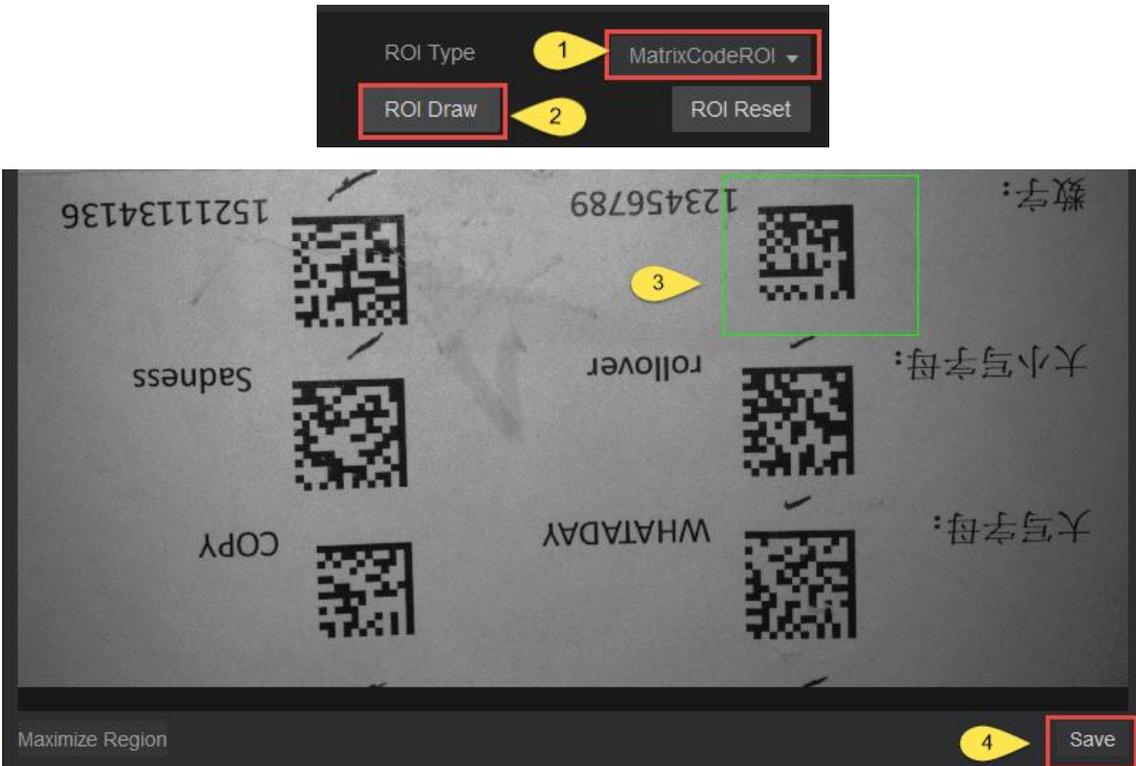


Figure 4-8 ROI drawing

- Enter the EasyID home page to view the effect in the image display area.

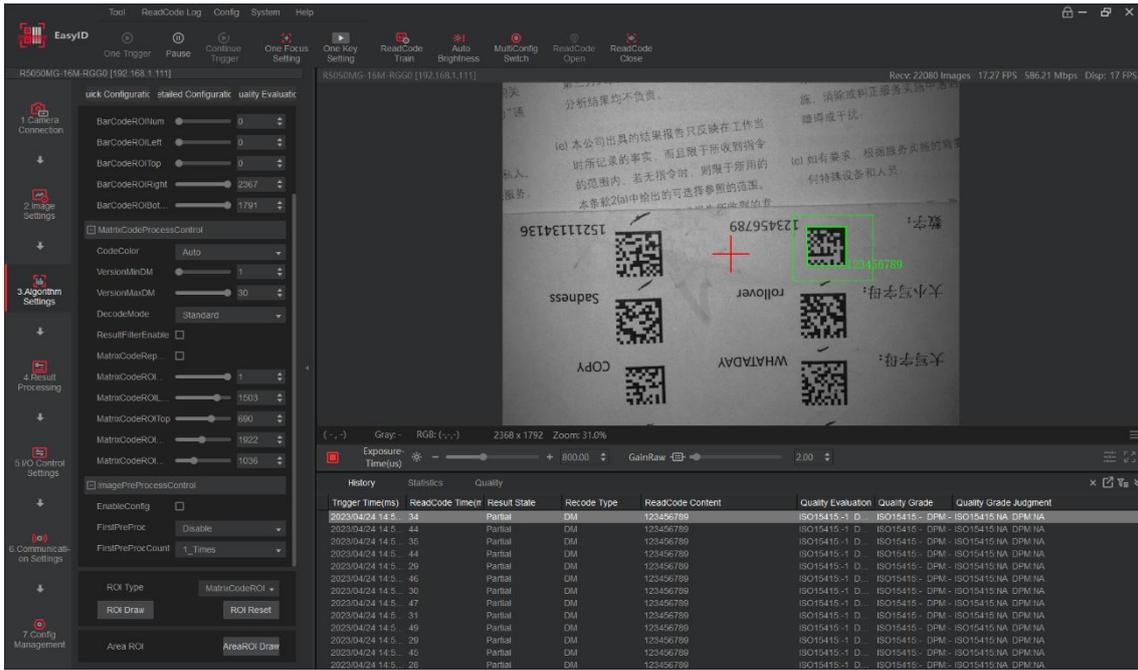


Figure 4-9 Algorithm ROI drawing

The result of decoding result ROI

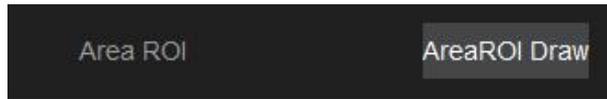


Figure 4-10 Region ROI entrance

Click Regional ROI Draw, and then the page is displayed. Select "Multi-zone function" check box, and then draw the required ROI region in the left as required. Up to 16 different regions can be set. You can select an area based on the actual scenario under Area Property Name, and select Advanced Settings below to set the desired area. In area 2, set the number of reads to 2

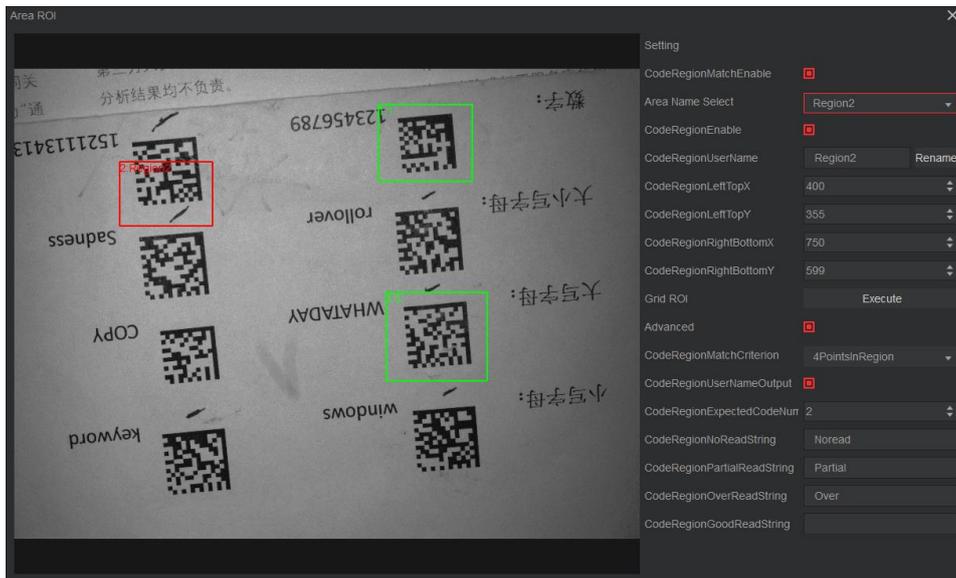


Figure 4-11 Region ROI settings

Table4-6 Description of ROI settings

Parameters		Range or Options	Description
Settings	Code Region Match Enable	Y/N	Enable or disable this function.
	Area name select	Region1-16	You can select the drop-down list to select the current operated region.
	Code Region Enable	Y/N	Enable or disable the currently operated region.
	Area name	Customizable	You can customize the region name.
	Code Region Left corner X/Y Lower right corner X/Y	Related to the pixels of the device model	The coordinates of the upper left and lower right corners can be configured by directly selecting numbers or drawing box on the page.
	Grid ROI	/	The number of rows and columns can be set by yourself. The maximum number is depending on the specific model
Advanced Configuration	Advanced Configuration Enable		
	Code Region Match Criterion	4/3/2 Points in Region	It means that the number of corner points of the code successfully read in the area (there are 4 in total for one code). Take 3 points in region as an example. If all 3 points are in the region, the code reading is successful.
	Code Region Username Output Enable	Y/N	Enable or disable region name output.
	Code Region Expected Code Number	Related to the number of codes that can be read	The expected number of codes that can be read per region.
	Code Region No Read String	Customizable	Outputs characters when the bar code is not read. You can customize it or keep it as default.
	Code Region Partial Read String	Customizable	Outputs characters when the number of codes is less than the expected value. You can customize it or keep it as default.
	CodeOverReadString	Customizable	Outputs characters when the number of codes exceeds the expected value. You can customize it or keep it as default.
Code Region Good Read String	Customizable	Outputs characters when the number of codes is the expected value. It is usually the default value.	

Close the regional ROI window when the settings are complete.

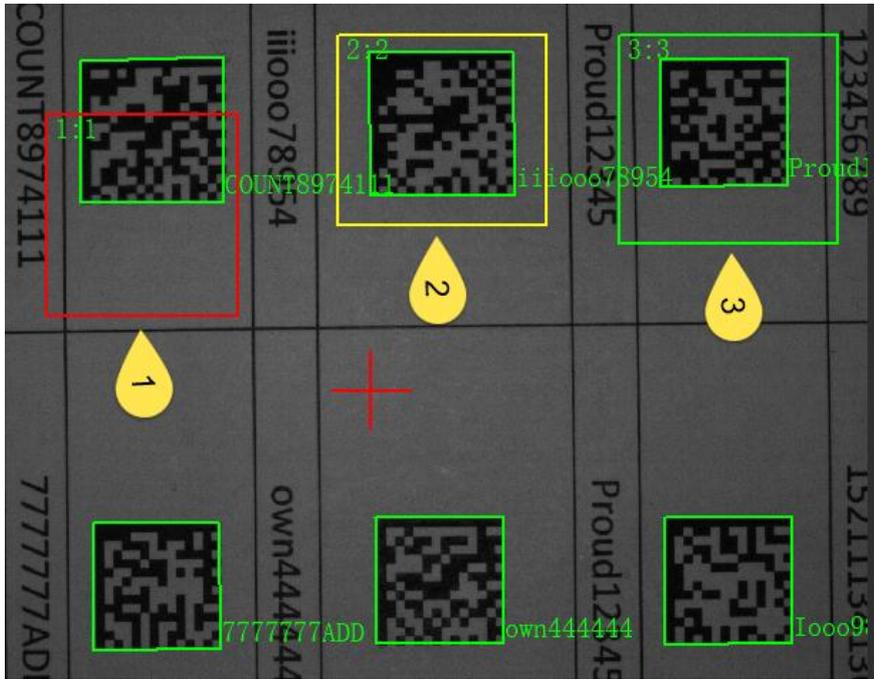


Figure 4-12 Zone ROI setting effect

The red box shows unrecognized code, the yellow box shows partial recognition, and the green box shows all recognition. The code is still visible in the rest of the camera's field of view, but the result is not processed in any way.

4.1.2.3 Quality evaluation page (affected by scenes and images, results are for reference only)

Select Algorithm Configuration > Quality Evaluation, you can set various quality evaluation parameters.

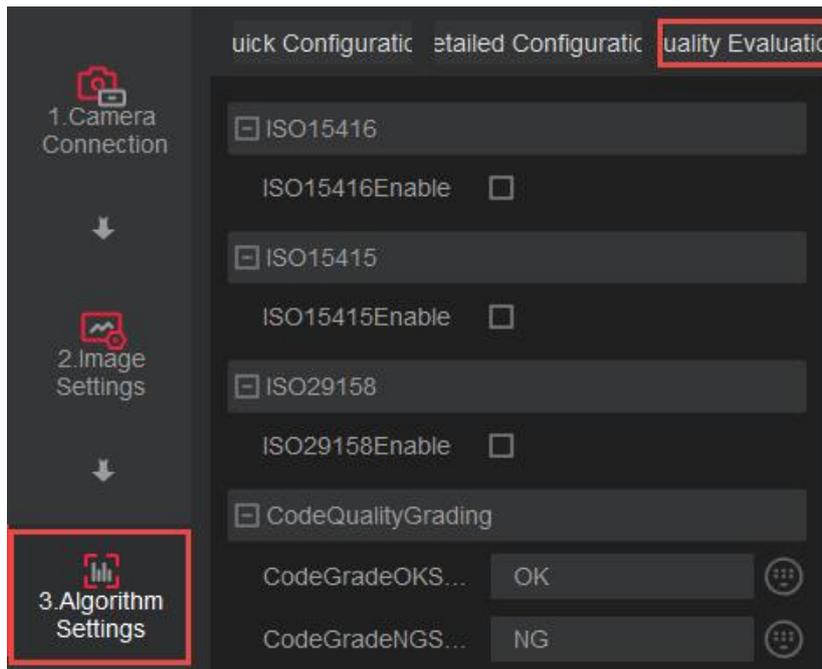


Figure 4-13 Parameters of Quality Evaluation

Table4-7 Code quality evaluation

Parameters		Options	Description
ISO15416 quality evaluation	ISO15416 standard quality evaluation Enable	Y/N	Select the check box to enable the function.
	Decoding enabled	Y/N	Select the check box to enable the function.
	Symbol contrast enable	Y/N	Select the check box to enable the function.
	Decoding enabled	Y/N	Select the check box to enable the function.
	Minimum Edge Contrast	Y/N	Select the check box to enable the function.
	Modulation	Y/N	Select the check box to enable the function.
	Minimum reflectivity	Y/N	Select the check box to enable the function.
	Defect	Y/N	Select the check box to enable the function.
ISO15415 quality evaluation	ISO15415 standard quality evaluation	Y/N	Select the check box to enable the function.
	Characters contrast	Y/N	Select the check box to enable the function.
	Modulation	Y/N	Select the check box to enable the function.
	Reflectance margin	Y/N	Select the check box to enable the function.
	Locate image damage	Y/N	Select the check box to enable the function.
	The heterogeneity of the axis	Y/N	Select the check box to enable the function.
	Heterogeneous grid	Y/N	Select the check box to enable the function.
	Horizontal printing stretch	Y/N	Select the check box to enable the function.
	Vertical printing stretch	Y/N	Select the check box to enable the function.
	Unused error correction	Y/N	Select the check box to enable the function.
	Decode successfully/failed	Y/N	Select the check box to enable the function.
	Format information damaged	Y/N	Select the check box to enable the function.
	Version information damaged	Y/N	Select the check box to enable the function.
ISO29158 quality evaluation	ISO29158 standard quality evaluation	Y/N	Select the check box to enable the function.
	DPM standard cell contrast	Y/N	Select the check box to enable the function.
	DPM standard cell modulation	Y/N	Select the check box to enable the function.
	DPM standard reflectance margin	Y/N	Select the check box to enable the function.
	DPM standard locate graphics damage	Y/N	Select the check box to enable the function.
	DPM standard the heterogeneity of the axis	Y/N	Select the check box to enable the function.
	DPM standard heterogeneous network	Y/N	Select the check box to enable the function.
	DPM standard horizontal print scaling	Y/N	Select the check box to enable the function.
	Enable vertical print scaling for DPM standard	Y/N	Select the check box to enable the function.
	Unused error correction	Y/N	Select the check box to enable the function.
	Decode successfully/failed	Y/N	Select the check box to enable the function.
	Format information damaged	Y/N	Select the check box to enable the function.
	Version information damaged	Y/N	Select the check box to enable the function.
Code quality evaluation	xx	/	Options: A/>=B/>=C/>=D
	OK	Custom	Supports enter custom Chinese and English characters, and up to 32 bytes can be entered.
	NG	Custom	Supports enter custom Chinese and English characters, and up to 32 bytes can be entered.

ISO15416 quality evaluation

Select the check box, and then set the standard in Code Quality Evaluation

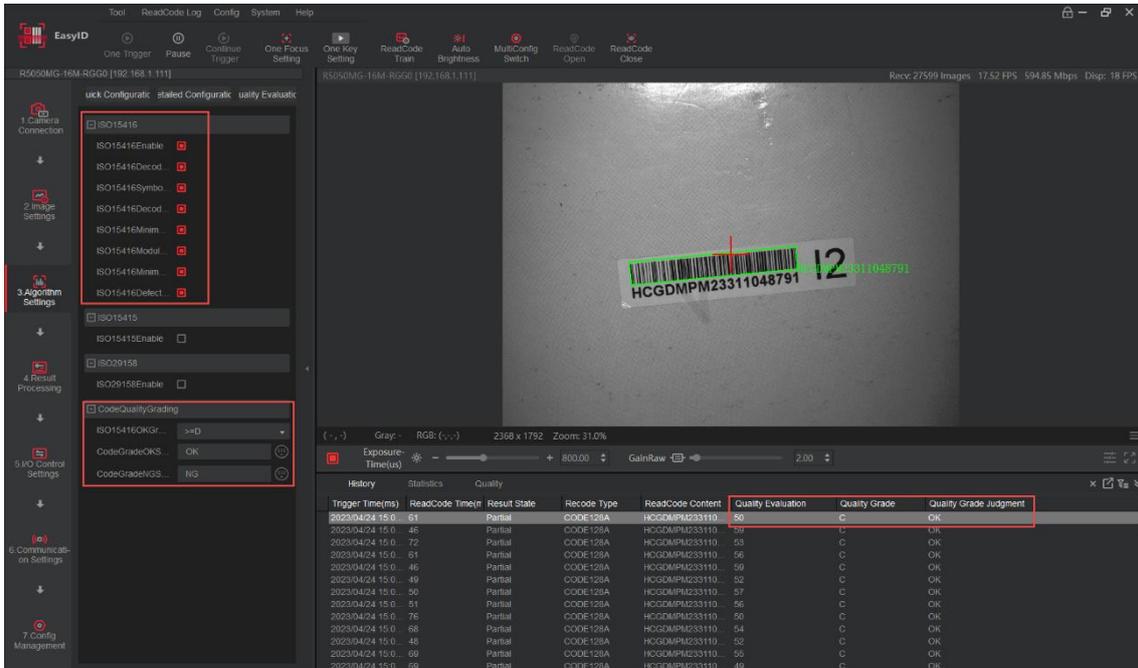


Figure 4-14 ISO15416 quality evaluation example

ISO15415 quality evaluation:

Select the check box, and then set the standard in Code Quality Evaluation

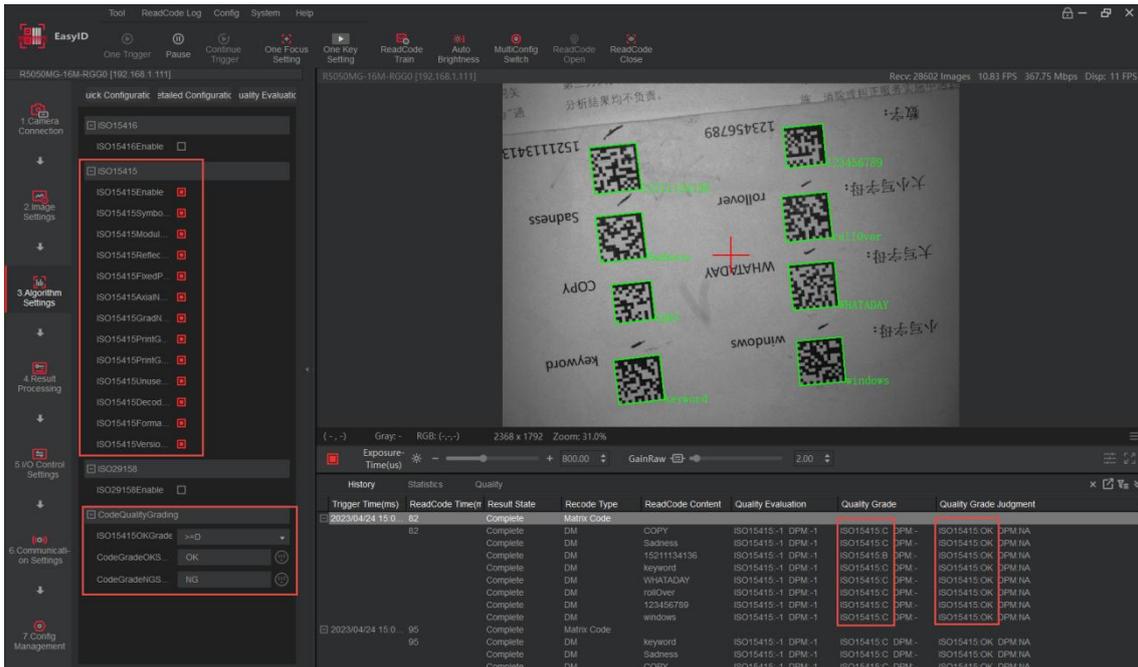


Figure 4-15 ISO15415 quality evaluation example

ISO29158 quality evaluation

Select the check box, and then set the standard in Code Quality Evaluation

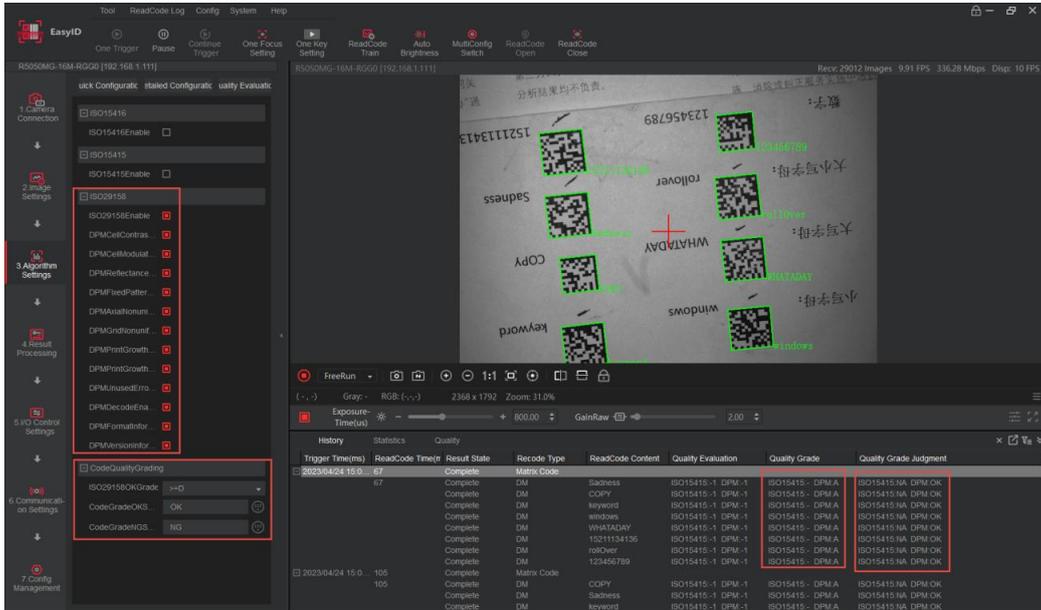


Figure 4-16 ISO29158 quality evaluation example

4.1.3 Result processing configuration

On the configuration page of result processing, you can configure the result, including selecting transmission mode, enabling result packaging, tail data, filling code value length and more.

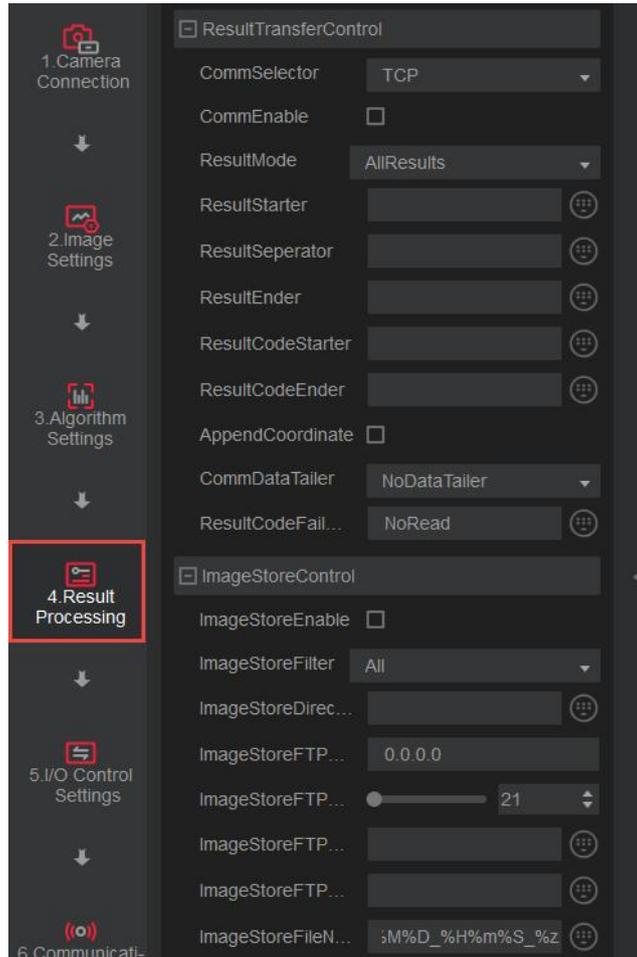


Figure 4-17 Result processing page

Table4-8 Parameter description of results processing

Parameters		Range or Options	Description
Result transmission mode	Transmission mode selection	TCP/Profinet/ModbusTcp/FINS/EthernetIP/MC/Serial port results packing	Select the communication way from the drop-down menu when outputting data, including TCP/Profinet /ModbusTcp/FINS/EthernetIP/.
	Results package	Y/N	Enable or disable the currently selected communication method.
	Result output configuration	All/all read/partially read/partially or all read/partially or no read/no read/custom	Control the data output logic according to the code reading results. All: Output data regardless of the result. Read all: Output data when the result meets all conditions. Partial or all: Output data as long as the code is read Partial or none: the opposite logic of Read All. None: Output data when all code is read.
	data Starter	Custom	The settings between the data can be customized or select from the keypad list
	Data Separator	Customizable	The settings between the data can be customized or selected from the keypad list.
	Result Ender	Custom	The settings between the data can be customized or selected from the keypad list.
	Result Code Starter	Custom	The settings of decoding results can be customized or selected from the keypad list.
	Result Code Ender	Custom	The settings of decoding results can be customized or selected from the keypad list.
	Code Coordinates	Y/N	When enable the function, the coordinate of the code will output
	Tail data	No data/add carriage return/add line feed/add carriage return and line feed	The last tail data of the whole set of data
	Message sent when there are no code reading	Custom	The settings of decoding results can be customized or select from the keypad list
Image saving configuration	Image saving	Y/N	
	Filter	All/all read/partially read/partially or all read/partially or no read/no read	Control the Image output logic according to the code reading results. Output without conditions: Output data regardless of the result. Read all: Output data when the result meets all conditions. Partially: Output data when the code is partially read. Partial or all: Output data as long as the code is read Partial or none: the opposite logic of Read All. No read: Output data when there are no code reading.
	Image storage directory	Custom	The settings of image storage directory can be customized or selected from the keypad list.

Parameters		Range or Options	Description
	IP address of FTP server	Custom	Configure the IP
	The port of the FTP server	1-65535	Custom, You can set 1 to 65535.
	The username of FTP server	Custom	Username settings. It can be customized or selected from the keypad list.
	The password of the FTP server	Custom	Password settings. It can be customized or selected from the keypad list.
	The name of the save file	Custom	Format. It can be customized or selected from the keypad list.

Notes: Y: enable this function; N: not enable this function.

4.1.4 Input/Output control

Input/output configuration page of the camera.

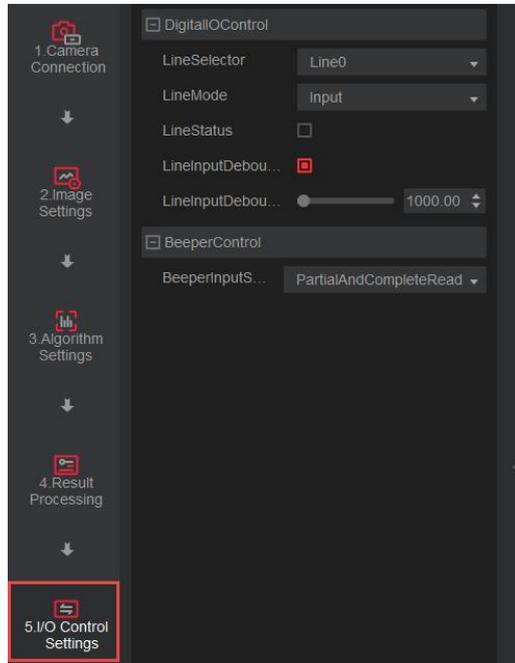


Figure 4-18 I/O configuration

Table4-9 Parameter description of I/O configuration

Parameters		Range or Options	Description
I/O configuration	Optical coupling Selection	Select I/O channels	The I/O channels might be different depending on the device models.
	Line Mode	Configure I/O functions	Select input or output. In general, you do not need to configure this parameter.
	Line Input Debounce Enable	Y/N	Enable or not enable debounce function.
	Input debounce filter	1000-255000, unit:us	Debounce time

Parameters		Range or Options	Description
Buzzer	Buzzer	All/all read/partially read/partially or all read/partially or no read/no read/custom output	Control the Buzzer output logic according to the code reading results. No read: no output Output when code reading is over. All read: Output data when the result meets all conditions Partially read: Output data when partially read. Partial or all read: Output data as long as there are code reading. partially or no read: the opposite logic of all read. No read: Output data when there are no code reading.

Notes: Y: enable this function; N: not enable this function.

4.1.5 Communication configuration

The communication configuration of the camera includes serial port configuration, network communication configuration, communication soft trigger configuration, and networking configuration.

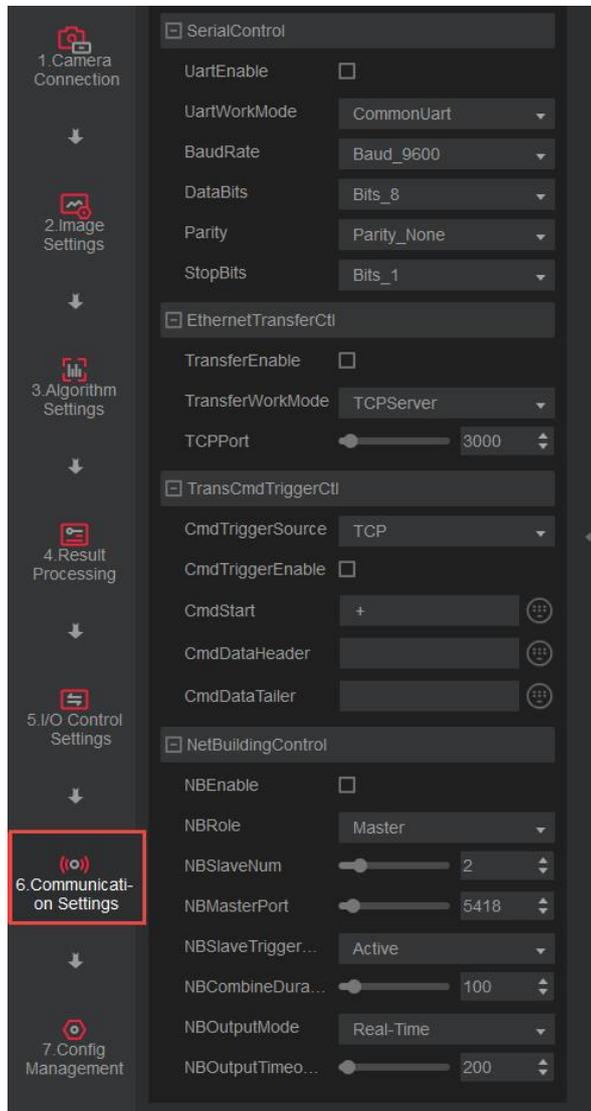


Figure 4-19 Communication Configuration

Table4-10 Parameter description of communication

Parameters		Range or Options	Description
Serial port configuration	Serial port communication enable	Y/N	Enable or not enable serial port transmission.
	Serial port communication mode	Common/HostLink mode	Common/HostLink mode, it is common mode by default.
	Baud Rate	9600/38400/ 57600/ 115200	9600/38400/ 57600/115200 , It is 9600 by default
	Data Bits	8/7 bit	8/7/6/5 bit, it is 8 by default.
	Odd-even examination	None/Even/Odd	None/Even/Odd, it is none by default.
	Stop Bits	1 or 2 digits	It is 1 digits by default.
Ethernet communication configuration	Transfer enable	Y/N	Enable or disable network transmission.
	Transfer Work Mode	TCP server/TCP client /Profinet/ModbusTcp server /FinsUDP client /FinsTCP client /EthernetIP server /MCUdp client /MCTcp client	Communication mode
	Port number	20 to 65535	Port number
Communication soft trigger configuration	Trigger Source	TCP/serial port triggering source	TCP/serial port triggering source
	Trigger	Y/N	Enable or not enable soft trigger
	Trigger Start character	Custom	It can be customized or selected from the keypad list.
	Cmd Data Header	Custom	It can be customized or selected from the keypad list.
	Cmd Data Tailer	Custom	It can be customized or selected from the keypad list.
Networking Configuration	Enabling networking configuration		
	Networking role	Main camera/ sub camera	

Notes: Y: enable this function; N: not enable this function.

Networking role setting indicates that the main and sub cameras are set respectively:

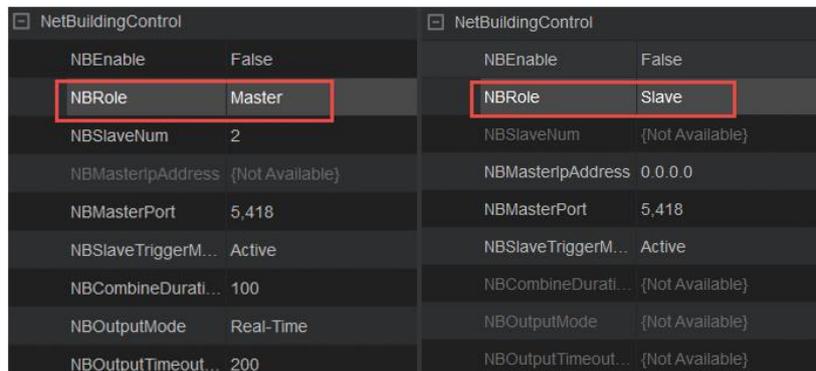


Figure 4-20 Camera Settings

Table4-11 Parameter description of networking camera

Parameters		Range or Options	Description
Main camera configuration	Number of sub camera	1-8	Up to 8 camera are supported
	Port of main camera	1024-65535	Custom, You can set 1024 to 65535.
	Trigger mode of sub camera	Please select the active mode/the passive mode.	Optional
	Output binding duration	10-1000	Custom. 10 to 1000 can be selected
	Output Mode	Real-time output/ Delayed output	Optional
	Timeout duration/ delay duration	50 to 5000	Custom. 50 to 5000 can be selected
Sub camera configuration	IP address of main camera	Custom	IP address configuration of main camera .
	Port of main camera	1024-65535	Custom, You can set 1024 to 65535.
	Trigger mode of sub camera	Please select the active mode/the passive mode.	Optional

4.1.6 Configuration Management

After configuring the camera parameters, you can save to user configuration 1 or user configuration 2 as needed, and then load the corresponding configuration after startup. You can also restart the device to set the startup configuration and import and export related configuration files.

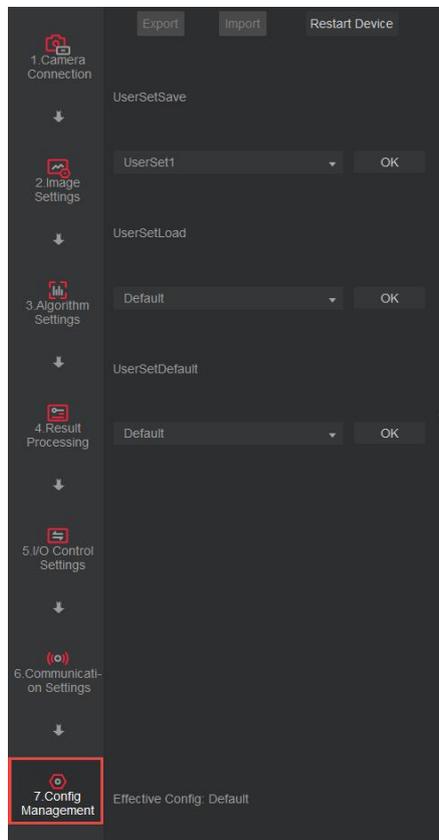


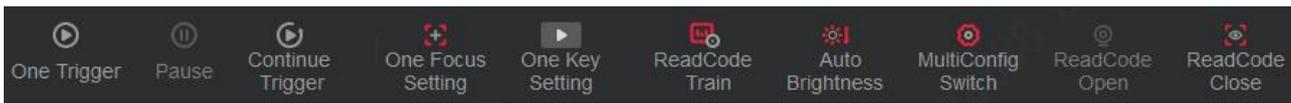
Figure 4-21 Configuration Management

Table4-12 Parameter description of configuration management

Parameters	Range or Options	Description
Export	-	Operation button , Click it to export configuration files. Note: When import or export files, the camera should pause acquiring stream.
Import	-	Operation button. Click it to import configuration files. Note: When import or export files, the camera should pause acquiring stream.
Restart	-	Operation button. Click it to restart the device.
Save configuration	User configuration	Select configuration number, and then click OK to save the configuration to designated number.
Configuration Loading	Default/User configuration1 to 8	After selecting configuration number, click OK. The camera will load configuration automatically.
Default configuration	Default/User configuration1 to 8	After selecting number, click OK. The camera will be powered on and load the configuration by default.

4.2 Quick Settings

Easy ID client will list some common configuration, as shown in the figure below. For some simple scenarios, these quick settings can meet the requirements of decoding.

**Figure 4-22 Quick settings****Table4-13 Parameter description of quick settings**

Parameters	Range or Options	Description
Single trigger	/	Operation button. Click it to trigger acquiring stream. This function is enabled only when the device is playing videos.
Pause	/	Operation button. Click it to stop acquiring stream.
Real-time trigger	/	Click it, and then the device is in real-time acquiring stream status. This function is enabled only when pull stream is paused.
Adjust focus with one click	/	Operation button. Click it to enter one click Focusing page.
One Key Setting	/	Operation button. Click it to enter one click configuration page.
Read Code Training	/	Operation button. Click OK in the pop-up window after triggered, and then the device will adjust algorithm configuration to improve decoding results.
Auto Brightness		Operation button. Click OK in the pop-up window after it is enabled. Device will automatically adjust the parameters of image to meet the requirements of decoding.
Switching Configurations	/	Operation button. Click it to enter multi configuration switching page. For details, see the following chapter.
Read Code enabled	/	Operation button. Click it, and then the device enter the visual mode and start decoding.
Read code not enabled	/	Operation button. After clicking it, the device enter preview mode, and only pull stream function is enabled.

4.2.2 Auto Brightness

The reader can automatically adjust the brightness according to the image effect, and make the image meet the decoding requirements by automatically adjusting the image parameters and the built-in illuminator.

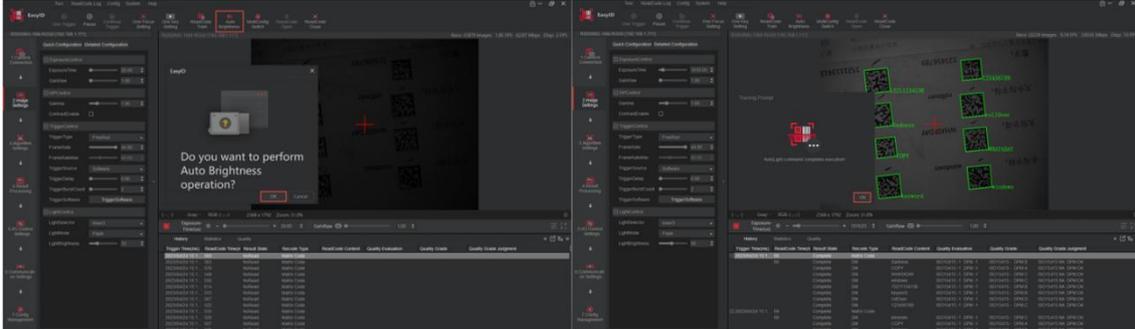


Figure 4-23 Comparison of before and after

4.2.3 Switching Configurations

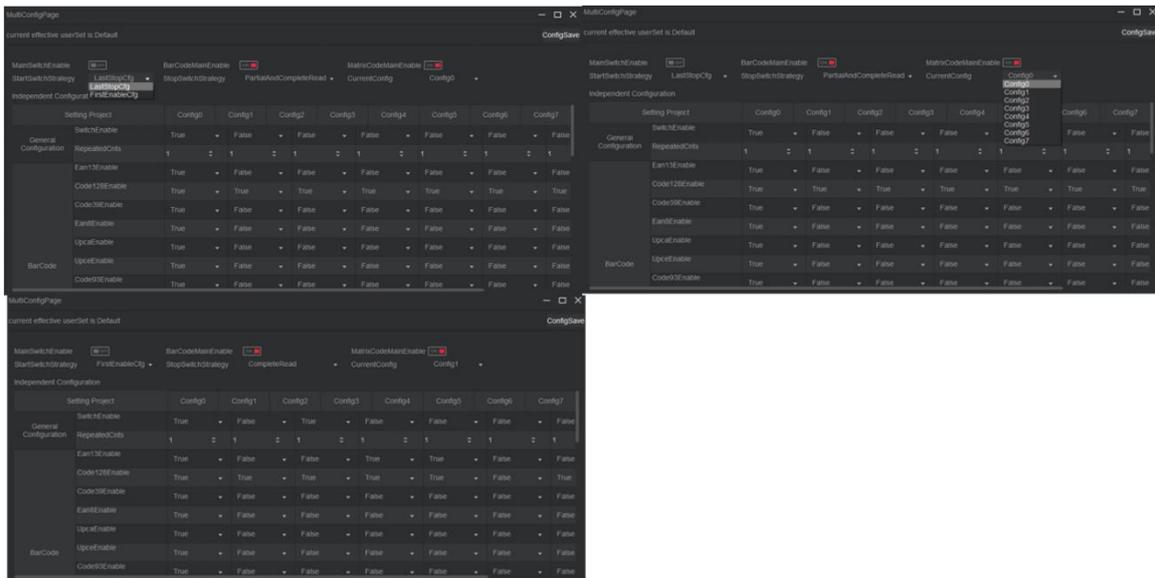


Figure 4-24 Switching Configurations

Table4-14 Parameters description of switching configurations

Parameters	Range or Options	Description
Multi configurations switching	On/Off	Only when it is on can configuration switching take effect. 8 configuration groups: Default; UserSet1–UserSet1. In every group, you can configure the parameters of Config 0–7. Note: After enabling it, the parameters in the group configuration will be locked and commissioning is not allowed.
Start Switch Strategy	Last Stop/First Stop	Start polling with the parameter when you last stopped polling/Start polling with the parameter when you first polled
QR Code Enable	On/Off	Enable or disable bar code.
Matrix Code Enable	On/Off	Enable, and the QR code reader enabled.
Stop Switch Strategy	Partial or all/All	Stop output in these two cases.

Parameters	Range or Options	Description
Current Configuration	Group 0 to 7	8 configuration groups: The configuration groups that the reader is currently using.
Grouping configuration	Group 0 to 7	Different parameters can be configured in different groups according to the actual situation to facilitate polling.

4.3 Menu Bar

Easy ID menu bar includes the following functions.

4.3.1 Tools

The tool bar consists of two parts: camera tool (firmware upgrade) and USB NIC driver installation (driver installation is used for pulling data).

Instructions:

Select Tool > camera tool, and then Firmware Version Upgrade is displayed.

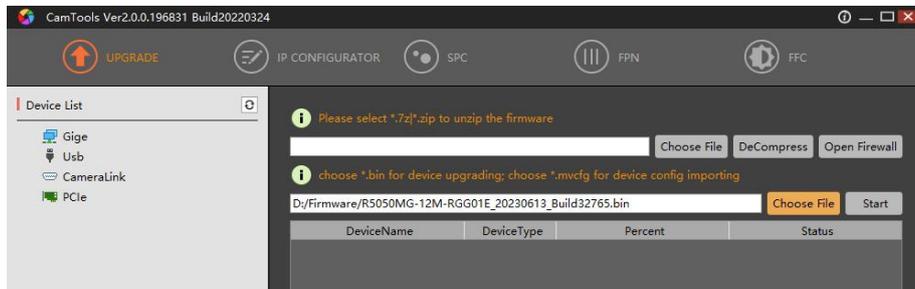


Figure 4-25 Device firmware version upgrade procedures

Select the cameras to upgrade from the device list and check the IP address. Click Select on the right, and then select and import the suitable firmware version. Click Start to start upgrading firmware.

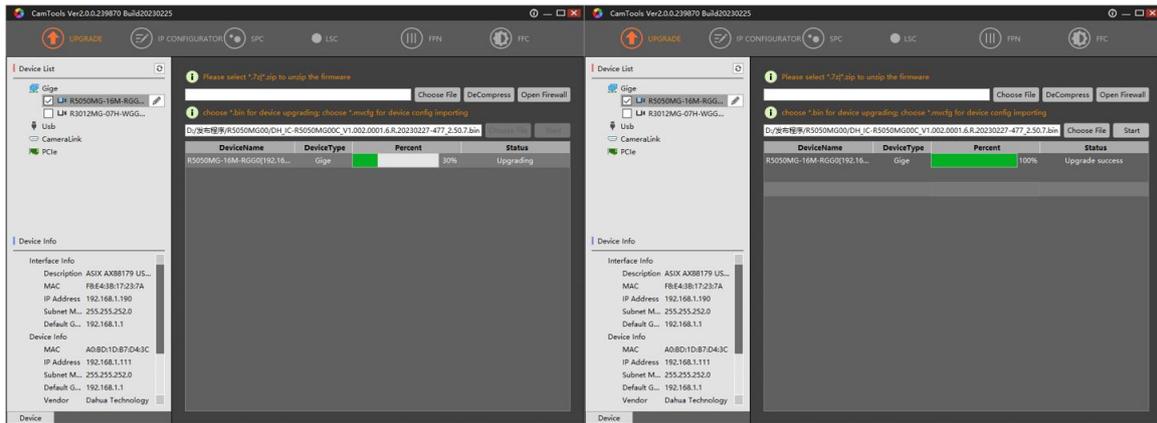


Figure 4-26 Firmware upgrade

After upgrading firmware, the device will automatically power off and restart. After that, you can go to the homepage to view the device version.



- When upgrading the firmware, disconnect the camera from the EasyID main page. Otherwise, the message Connection Failed will be displayed.

4.3.2 ReadCode Log

This function records the operation logs of the reader. If there is a device, you can export the logs and send the device information to technical support.

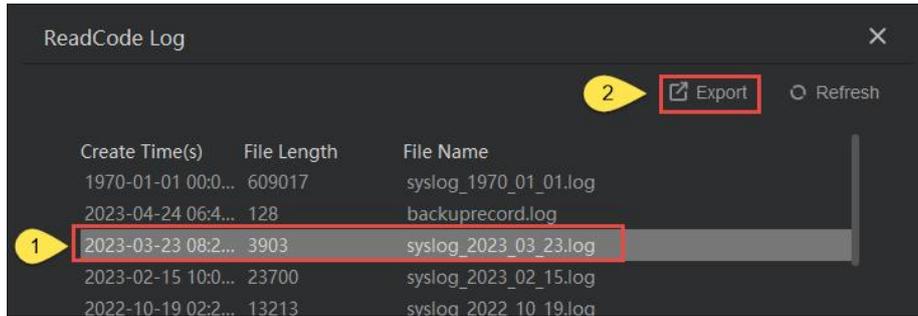


Figure 4-27 Device Log Export

4.3.3 Configuration

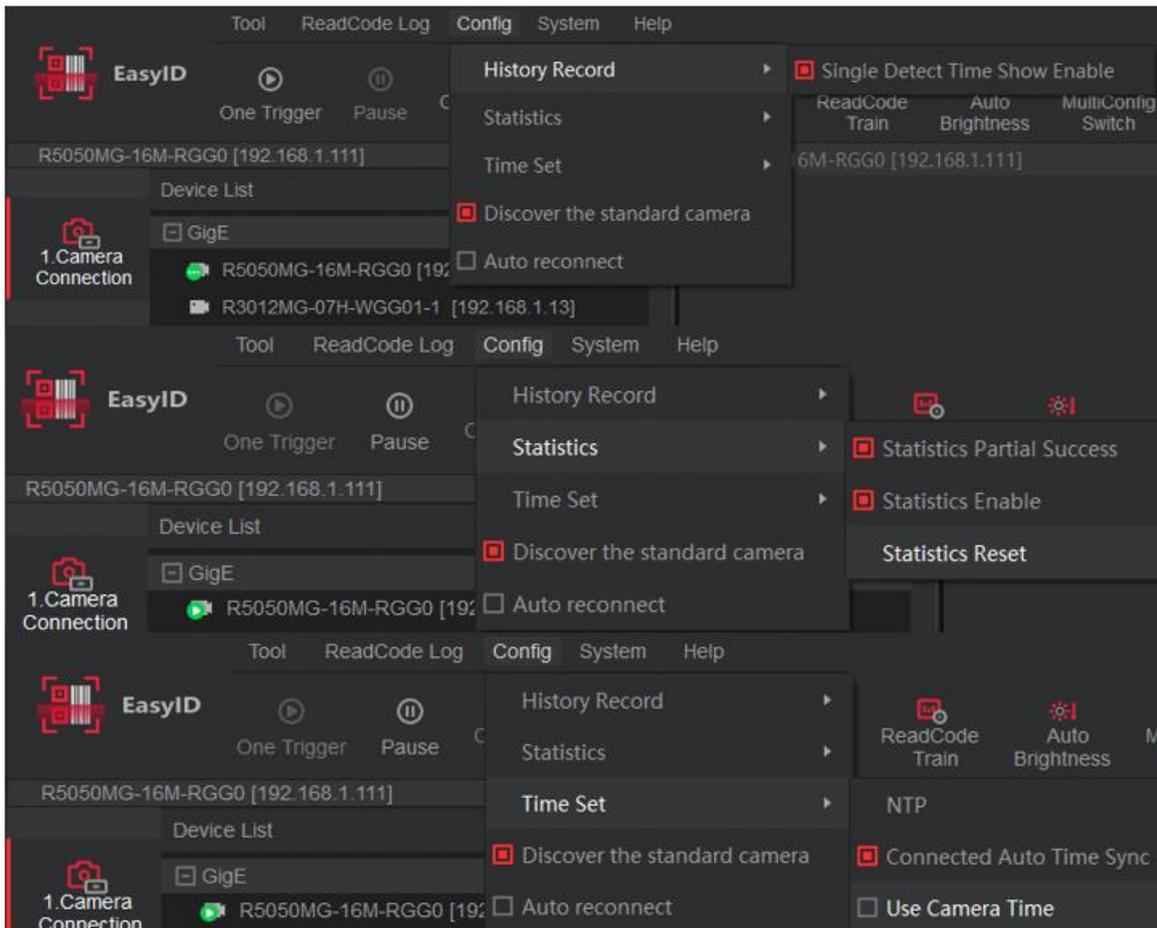


Figure 4-28 Configuration

Table4-15 Parameter description

Parameters	Description
History Record	Enable single-item time consuming
Statistics	Reading partial bar codes means the read is successful (when this function is disabled, if 10 bar codes need to be read and 8 bar codes are actually read, the bar code reading will fail). You can enable, disable, and clear statistics.
Time settings	NTP Mode, Get System Time, Auto Time Sync, Connected Auto Time Sync, and Use Camera Time are available.
Discover the standard camera	Select it to find earlier version cameras.
Auto-Reconnect	Enable the function, and then the camera can be automatically reconnected after disconnection.

4.3.4 System

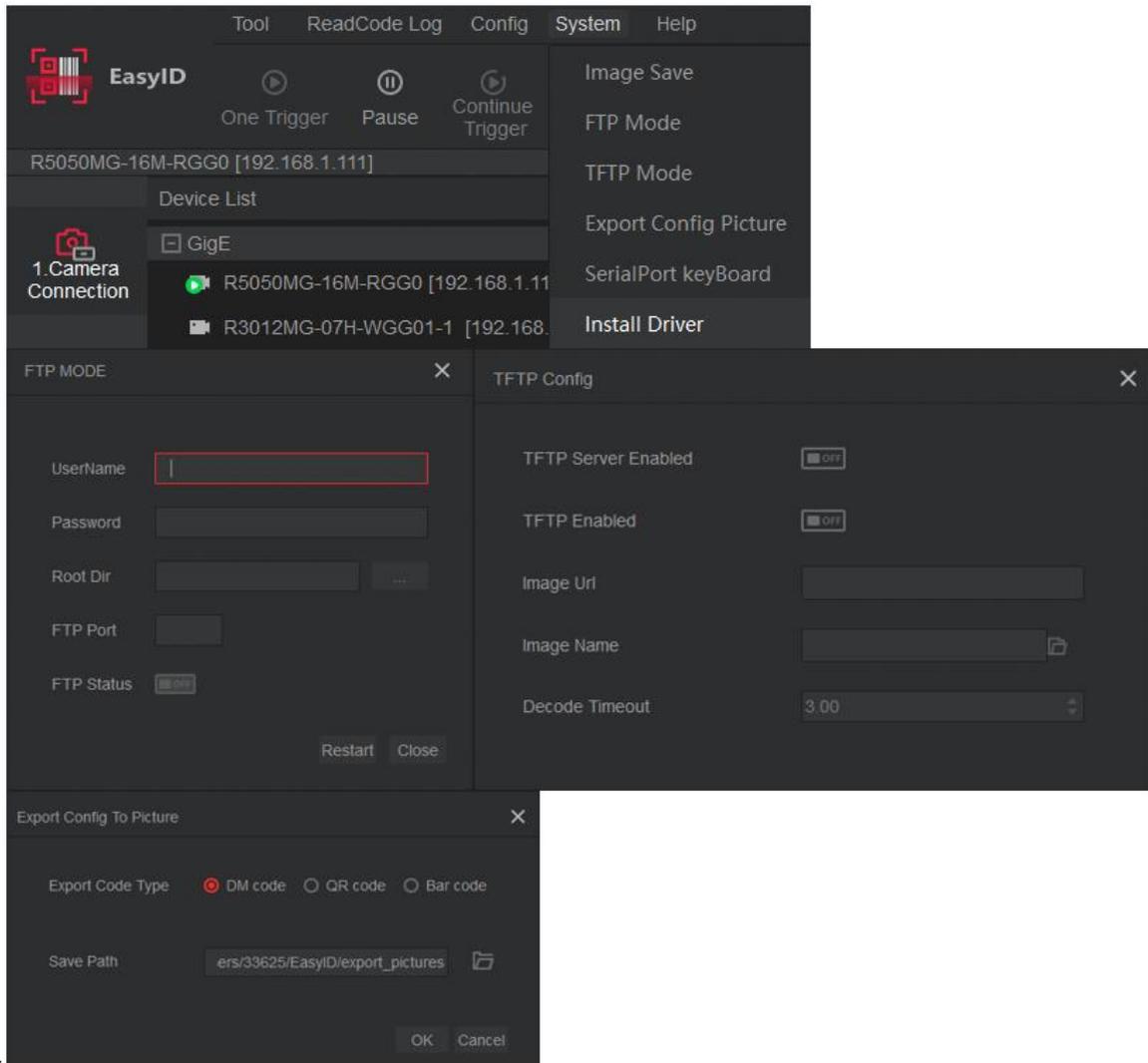


Figure 4-29 Configuration

Table4-16 System settings

Parameters	Description
Image Save	You can save images according to the reading status, and select the storage path.
FTP Services	Start the FTP server that comes with EasyID, which is generally used with the FTP image storage function of the camera. FTP image storage: You can store images according to different reading

	status, and customize the image name and storage path.
TFPT Mode	Start the TFTP server that comes with EasyID. The commissioning function is encrypted.
Export Configuration Picture	Export the parameter configuration as a picture (Code128/DM or QR code), and the code reading device can read and configure the parameters by reading the code.
Virtual keyboard	Output focus or specify output to a certain position with mouse.
Install drivers	Used for installing drivers

4.3.4.2 Image Storage

Picture Save is one of the most commonly used functions, which can save all decoded pictures according to the usage scenario for traceability. Besides, if the image is unable to decode, you can provide the images to sales or technical support for parameter adjustment or algorithm optimization. Save image

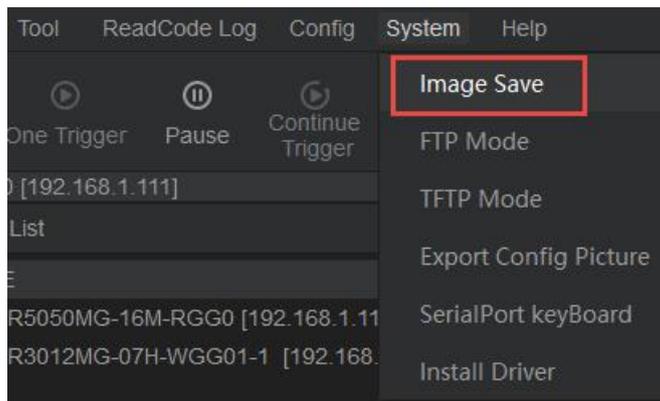


Figure 4-30 Image saving

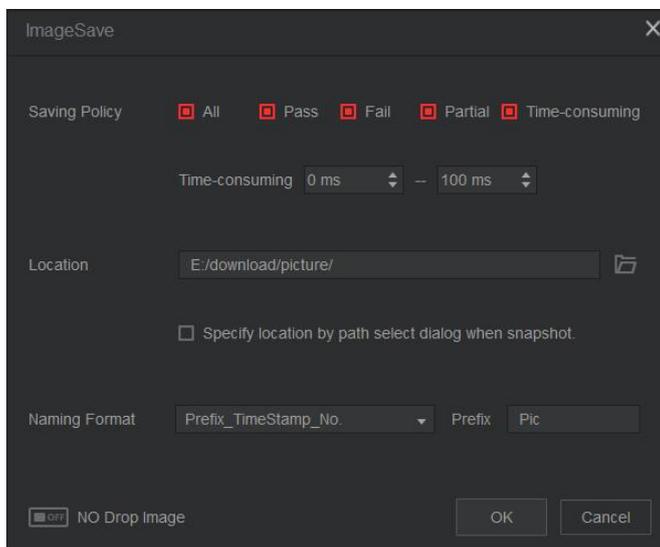


Figure 4-31 Image saving

You can save the images in BMP or JPEG format.

You can select storage strategies including all pictures, decoding, decoding failure, partially decoded.

Save images in the following two methods:

- Click Auto Save in the control bar of the image display page, and then every image received will be saved.

- Click Manual Save in the control bar of the image display page to save images manually.

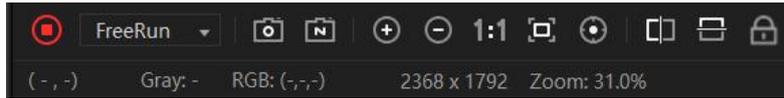


Figure 4-32 Image saving

4.3.4.3 Virtual keyboard

Virtual keyboard of the EasyID client can debug device quickly.

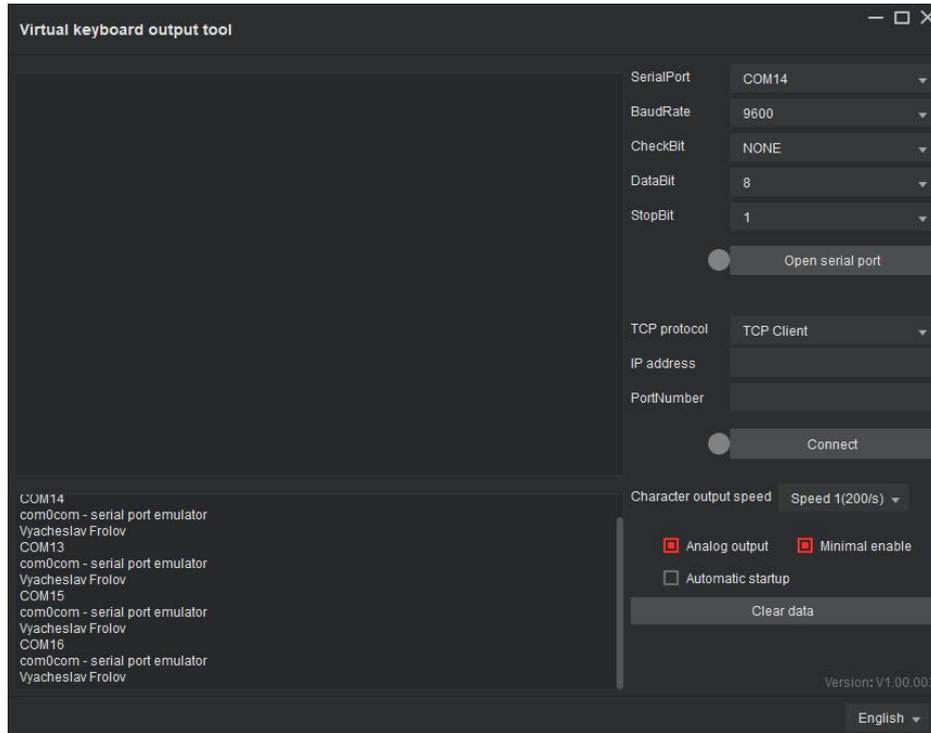


Figure 4-33 Virtual keyboard

Table4-17 Parameters for virtual keyboard

Parameters	Description
virtual serial port keyboard	For details on serial port configuration, see “Communication Settings”. You can click Open serial port , and then use virtual keyboard through serial port.
virtual network port keyboard	For details on network port configuration, see “Communication Settings”. You can click Connect , and then use virtual keyboard through network port.
Character Output Speed	5 levels are optional: Speed 1 (200/s); Speed 2 (250/s); Speed 3 (330/s); Speed 4 (500/s); Speed 5 (1000/s). Under the premise of normal use, low speed transmission is preferred, which is more stable and reliable.
Analog Output	Enable or disable output function of virtual keyboard.
Minimal enable	Enable or disable the minimization function.
Auto run at startup	Enable or disable automatic startup.
Clear data	Click to clear the data.
Switch Language	Change the language between English and Chinese.
Display column	On the left is the display bar for content display.

Serial Port Simulation

- Check the serial port number of the receiving end by referring to the connected cable.
- Double-click EasyID client to open it, and then select Configuration List > Serial Port Configuration. Select the check box of serial port to enable this function, and then configure the parameters according to actual needs.
- Open the EasyID client, and then select Configuration List > Results Method. Select Packing Serial Port Results, and then configure results output.

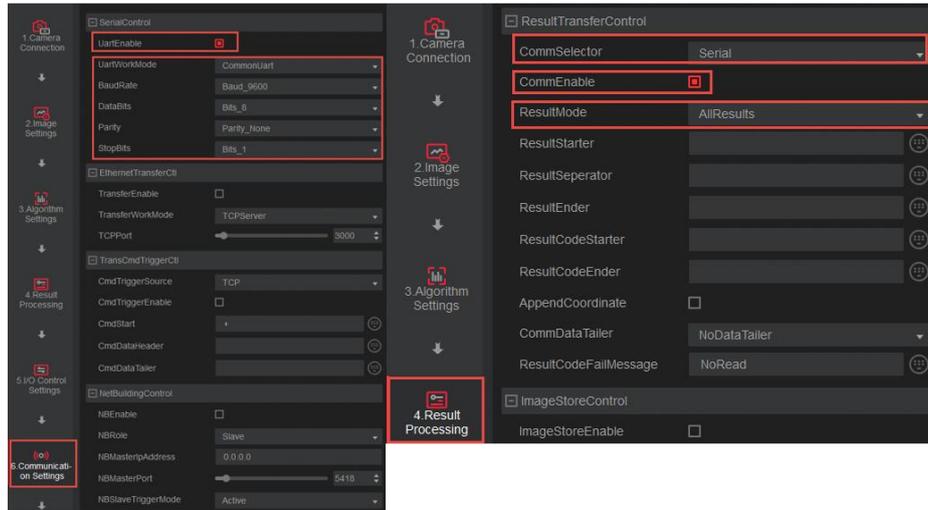


Figure 4-34 Serial Port Setup of EasyID Client

- Select Virtual Keyboard Output Tools, and then select serial port number, check serial port configuration. After check, click Open. When the device recognizes the code, it will output data and display it on the left.

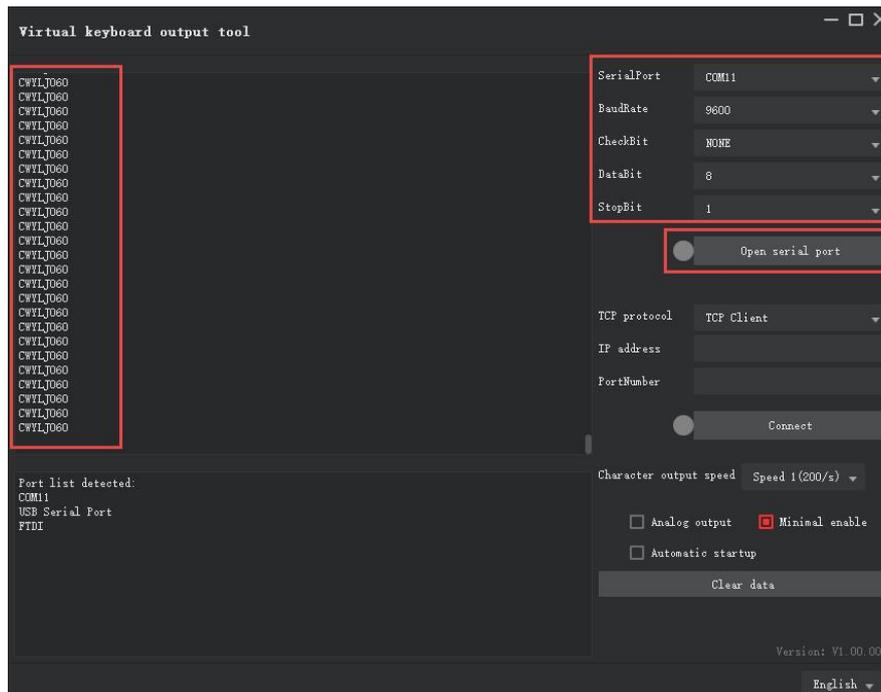


Figure 4-35 Serial Port output result



- Check parameter configuration of EasyID client and output tool and ensure the data are exactly the same, otherwise, the serial port may be disconnected or garbled.

TCP Service Settings: The reader can serve as either a TCP client or a TCP server.

Use TCP server serve as a TCP client as an example, the configuration is similar to the configuration of serial port communication.

➤ Open EasyID client, select configuration list > network communication configuration. Select the check box of Transmission, and then configure the Reader as the TCP client. Set the serial port and enter the IP address.

➤ Open EasyID client, select configuration list > Result Processing. Select the check box of Transmission, and then configure the Reader as the TCP client. Set the serial port and enter the IP address.

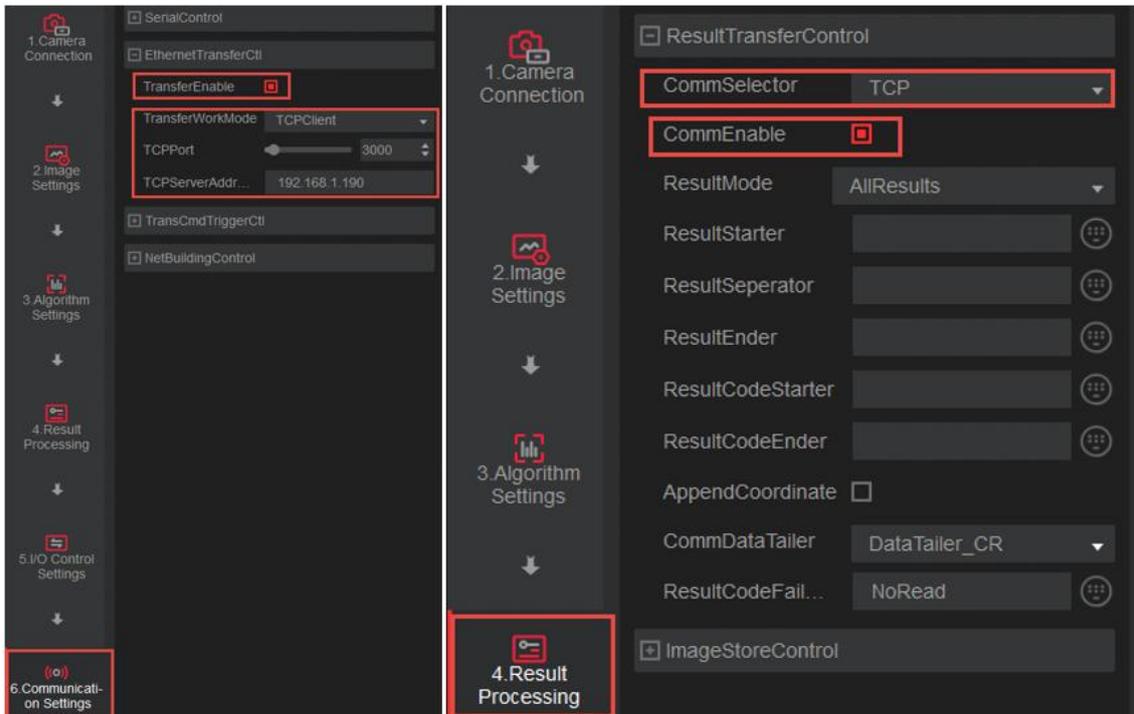


Figure 4-36 TCP configuration on EasyID Client

➤ Enter the "Virtual Keyboard Output Tool", and then select TCP protocol as "TCP server". Make sure that the port number and EasyID are configured, and then click "Open". When the device recognizes the code, the data will be output and displayed in the left.

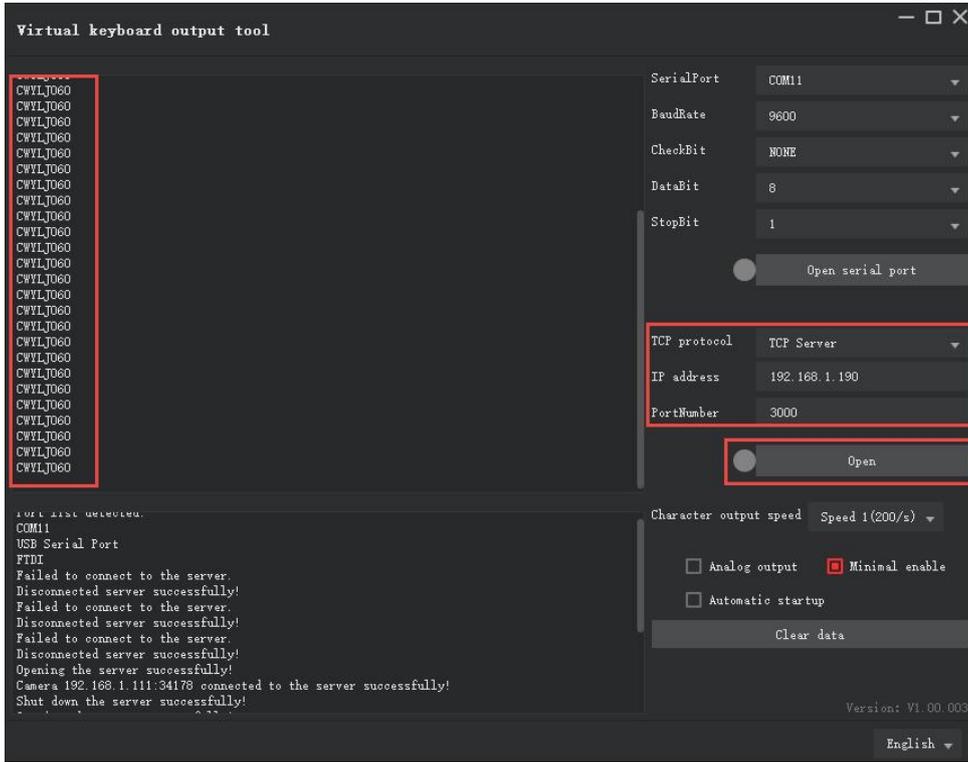


Figure 4-37 TCP transmission results

4.3.5 Help

Table4-18 Parameter description of menu

Parameters	Range or Options	Description
Automatic startup	/	Select the check box, and then the system will automatically start
Language	/	You can select Chinese or English
User's Manual	/	Click to view the User's Manual
About	-	You can view the version information of the client and company information.

- Algorithm results will be displayed in list on the page.
- Click Export to the results in txt format.
- Configure the filter to filter the results.

Trigger Time(ms)	ReadCode Time(m)	Result State	Recode Type	ReadCode Content	Quality Evaluation	Quality Grade	Quality Grade Judgment
2023/04/24 16:2...	21	Partial	Barcode_Matrix ...				
	6	NoRead	Barcode				
	14	Complete	QR	CWYLJ060	ISO15415-1 D...	ISO15415- DPM-	ISO15415.NA DPM.NA
2023/04/24 16:2...	22	Partial	Barcode_Matrix ...				
	6	NoRead	Barcode				
	15	Complete	QR	CWYLJ060	ISO15415-1 D...	ISO15415- DPM-	ISO15415.NA DPM.NA
2023/04/24 16:2...	21	Partial	Barcode_Matrix ...				
	6	NoRead	Barcode				
	14	Complete	QR	CWYLJ060	ISO15415-1 D...	ISO15415- DPM-	ISO15415.NA DPM.NA
2023/04/24 16:2...	22	Partial	Barcode_Matrix ...				
	6	NoRead	Barcode				
	15	Complete	QR	CWYLJ060	ISO15415-1 D...	ISO15415- DPM-	ISO15415.NA DPM.NA
2023/04/24 16:2...	24	Partial	Barcode_Matrix ...				

Figure 4-38 Algorithm display

In start read mode, you can enable the statistics function to display related statistics. Click Clear to clear the statistics and start again.

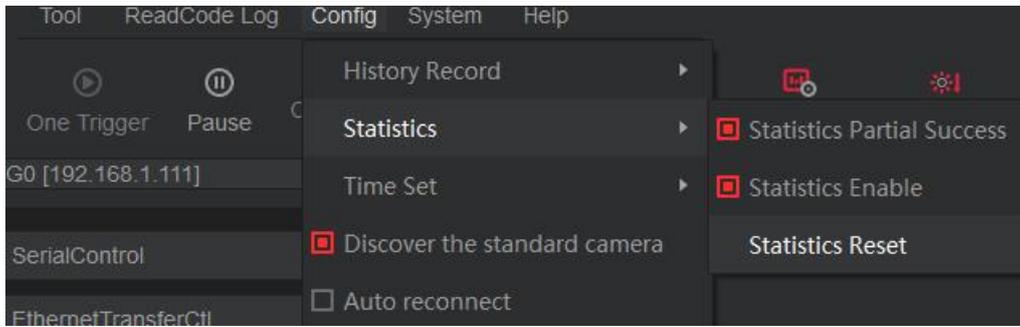


Figure 4-39 Statistics Operations

History	Statistics	Quality
12041	11984	57
Total	Succeed	Failed
		99.527%
		Rate

Figure 4-40 Statistical information display

Click the detailed quality evaluation information to expand the detailed quality evaluation index. Select a certain read record to display the detailed quality evaluation information.

History	Statistics	Quality					
Trigger Time(ms)	ReadCode Time(m)	Result State	Recode Type	ReadCode Content	Quality Evaluation	Quality Grade	Quality Grade Judgment
2023/04/24 16:2...	21	Partial	Barcode_Matrix ...				
	6	NoRead	Barcode				
	14	Complete	QR	CWYLJ060	ISO15415-1 D...	ISO15415- DPM-	ISO15415:NA DPM:NA
2023/04/24 16:2...	22	Partial	Barcode_Matrix ...				
	6	NoRead	Barcode				
	15	Complete	QR	CWYLJ060	ISO15415-1 D...	ISO15415- DPM-	ISO15415:NA DPM:NA
2023/04/24 16:2...	21	Partial	Barcode_Matrix ...				
	6	NoRead	Barcode				
	14	Complete	QR	CWYLJ060	ISO15415-1 D...	ISO15415- DPM-	ISO15415:NA DPM:NA
2023/04/24 16:2...	22	Partial	Barcode_Matrix ...				
	6	NoRead	Barcode				
	15	Complete	QR	CWYLJ060	ISO15415-1 D...	ISO15415- DPM-	ISO15415:NA DPM:NA
2023/04/24 16:2...	24	Partial	Barcode_Matrix ...				

Figure 4-41 Quality Evaluation

5 FAQ

5.1 The application cannot find the camera device

Possible causes:

- ✧ The camera does not start normally, and the power supply does not meet the product requirements.
- ✧ Abnormal network cable connection.
- ✧ The camera and the client are not under the same network segment.
- ✧ Whether it is a non-standard protocol camera.

Solutions:

- ✧ Check power supply: make sure to use appropriate power supply and cable;
- ✧ Check the network connection: Check whether the reader indicator light is normal to ensure that the camera and the client are in the same LAN.

5.2 The application can find the camera device, but the connection fails.

Possible causes:

- ✧ The camera is not started successfully.
- ✧ The camera and the client are not under the same network segment.
- ✧ The camera is connected with other clients.

Solutions:

Restart the camera, try modifying IP to make it in the same LAN with the client. You can also try disconnect other connected clients and connect the current client again.

5.3 Camera disconnection

Possible causes:

- ✧ Network adapter or cable failures.
- ✧ Unmatched configurations of network adapter and camera.

Solutions:

- ✧ Perform cross verification for hardwares, if failure happens, replace the corresponding hardware.

- ✧ Check the NIC configuration.

5.4 The algorithm effect does not meet the expected value.

Possible causes:

- ✧ The image FoV or illumination does not meet the requirements.
- ✧ Illogical parameter configuration or algorithm failed to start.
- ✧ Whether the code itself has defects.

Solutions:

- ✧ Check the camera FoV and the illuminator. Review the camera parameters such as trigger mode, trigger delay, input smoothing, exposure and gain and illumination.
- ✧ Check whether the algorithm is started. Review the algorithm parameters, including type, scale, timeout, number, filter and error code rate.

5.5 Unable to enable external trigger.

Possible causes:

- ✧ Incorrect cable connection of external trigger.
- ✧ The trigger mode is not set to external trigger.

Solutions:

- ✧ Select the required trigger mode and make sure that the external cable connection is correct.

6 Clean and Maintenance

This section mainly introduces the clean and replacement of the color filter.

We installed a fully transparent protective glass for the black and white cameras, mainly to prevent dust from falling on the surface of the image sensor. The color camera is installed with a low-通 color filter that can cut off the near-infrared wave segment. If users have special requirements, such as not using color filter or using color filter of other transparent curves, the entire filter bracket outside the image sensor can be replaced (no need to remove the shell).

If the color filter surface requires cleaning, use special detergent made for optical materials so that no marks left after cleaning.