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User & Development Manual

FV10X (V2.0) Series

Industrial Fixed-mount Barcode Scanner

Nanjing Bilin Intelligent Identification Technology Co., Ltd.

Ver:20240315

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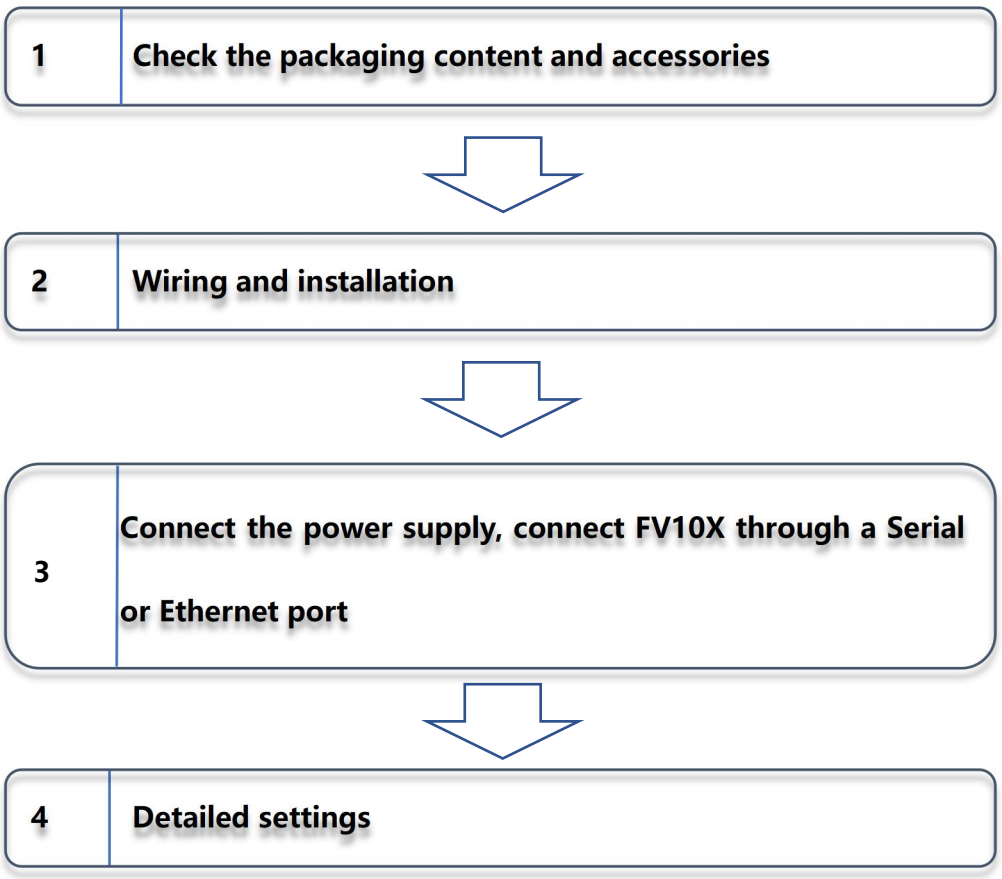
Setup Process

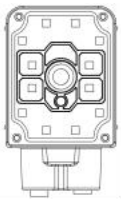
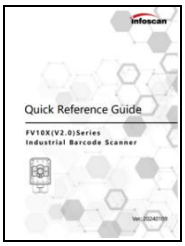


FV104 is a manual focusing barcode reader, while FV105 is an automatic focusing reader.

Most of the content in this manual takes FV105 model as an example, and the few differences between FV104 and FV105 will be described in notes.

1 BEFORE

1.1 Packing list

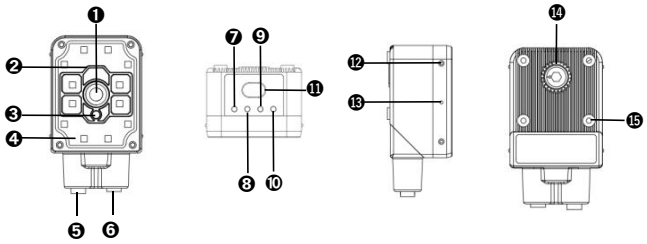
Model	Product Name	Packaging Content	QTY	Image
FV10X-XXXX (V2.0)	Industrial Fixed-mount Barcode Scanner	Host	1	
		Quick Reference Guide	1	
		L-shaped metal fixing piece	1	
		Insulated fixing sheet (acrylic)	1	
		Insulated screw (nylon)	4	
		Focus adjustment wrench (FV104 standard)	1	

1.2 Accessories

Name	Packaging Content	Model	QTY	Image
Cables	Serial port communication cable	H12M1V-S12 M1-D9P-A1	1	
	Ethernet communication cable	H8S-2M-RJ-V 3	1	
Light Source Filter	Full atomization filter (optional)	FT10012DD	1	
	Full polarization filter (optional)	FT10012PP	1	
	Semi-atomized + semi-polarized filter (optional)	FT10012PD	1	
Power Supply	Power adaptor	WT48-2402000-T	1	

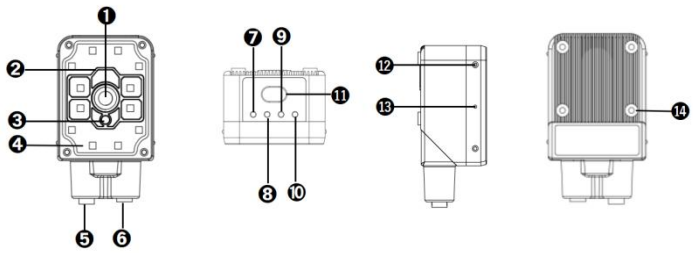
1.3 Component name and function introduction

1.3.1 The product shown below is FV104



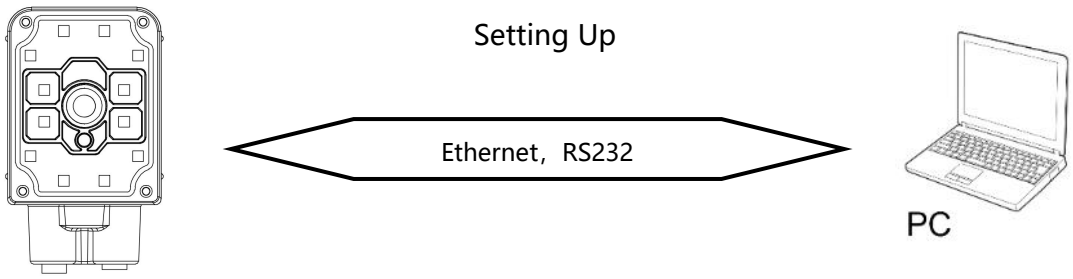
1	Lens
2	Lens cover
3	Laser aimer
4	Array LED light source
5	8 PIN Circular connector (Ethernet communication)
6	12 PIN Circular connector （Serial port communication, Power supply, I/O）
7	PWR （Power indicator - red）
8	GOOD (Reading success indicator - blue)
9	FAIL (Reading failure indicator - red)
10	TRAIN (indicator for one-click automatic parameter adjustment)
11	Trigger button
12	Light source filter buckle
13	Fixing hole for light source filter
14	Focusing adjustment knob
15	M5 Mounting hole

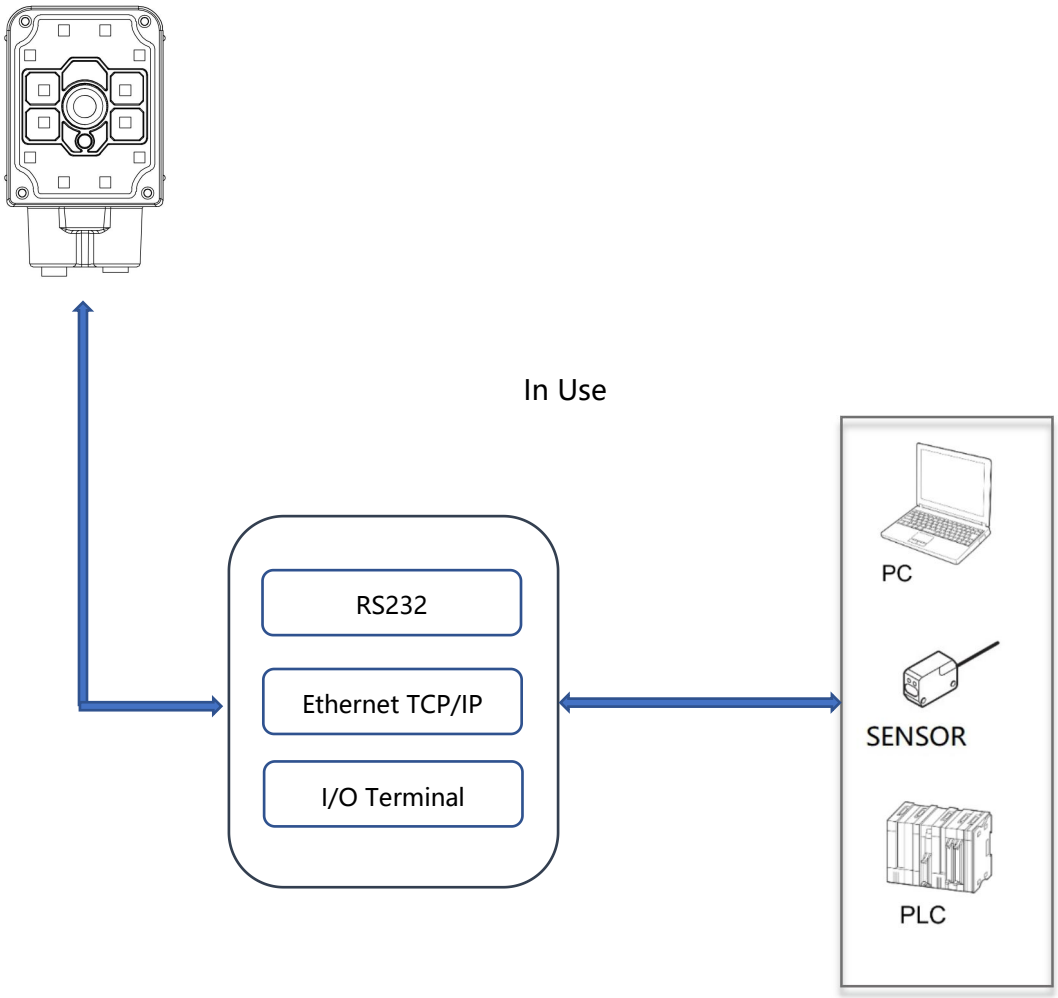
1.3.2 The product shown below is FV105



1	Lens
2	Lens cover
3	Laser aimer
4	Array LED light source
5	8 PIN Circular connector (Ethernet communication)
6	12 PIN Circular connector （Serial port communication, Power supply, I/O）
7	PWR (Power indicator - red)
8	GOOD (Reading success indicator - blue)
9	FAIL (Reading failure indicator - red)
10	TRAIN （indicator of one-click automatic parameter adjustment）
11	Trigger button
12	Light source filter buckle
13	Fixing hole for light source filter
14	M5 Mounting hole

1.4 System configuration

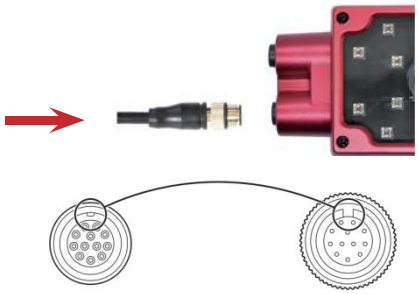




2 Connection and Wiring

2.1 Serial port communication cable connection

A.Connection between Host and Serial port communication cable



The arrow in the figure indicates the connection position of the Serial port cable. Align the protrusion on the cable connector with the groove of the corresponding device port; Rotate the connector screw clockwise to secure it; It is prohibited to plug and unplug the connector during normal working state/configuring process, otherwise it may cause abnormal states of the reader to occur.

B.Connection of the power supply

The arrow in the figure indicates the connection position of the power supply on the Serial port cable.

2.2 Ethernet communication cable connection

Connection between Host and Ethernet communication cable

The arrow in the figure indicates the connection position of the Ethernet communication cable. Align the protrusion on the cable connector with the groove of the corresponding device port; Rotate the connector screw clockwise to secure it; It is prohibited to plug and unplug the connector during normal working state/configuring process, otherwise it may cause abnormal states of the reader to occur.

Note: To power on the device (in working state), a Serial port communication cable must be connected to the device.

2.3 I/O terminal wiring

The I/O terminal is located on the Serial port communication cable. If the device is connected to external signals or drives external devices, this terminal needs to be used for connection with external devices. The picture of the terminals are shown below, and the definitions of the terminals are shown in the table.

Terminal color	Terminal name	Description	Remark
Black	GND	Power grounding	
Purple	GND	Power grounding	
Red	VCC	Power input (output)	Output: Can supply power to external devices (Note ①) Input: Can be connected to 20-30V for power supply
Blue	VCC	Power input (output)	Output: Can supply power to external devices (Note ①) Input: Can be connected to 20-30V for power supply
Pink	IN-C	Input common	Connect to VCC - input signal low level valid; Connect to GND - input signal high level valid
Grey	IN1	Input signal 1	Start reading NPN: ≤16V PNP: ≥5V (Max : 24V)
Dusty pink	IN2	Input signal 2	Reserved
Brown green	OUT-C	Output common	Form voltage feedback with OUT1-OUT4, 5V\24V\external voltage (not exceeding 30VDC)
Red blue	OUT1	Transistor output 1	Read success Internal pull-up optional, effective level selectable (Note ②)
White green	OUT2	Transistor output 2	Read failure Internal pull-up optional, effective level selectable (Note ②)
White	OUT3	Transistor output 3	Internal pull-up optional, effective level selectable (Note ②)
Brown	OUT4	Transistor output 4	Internal pull-up optional, effective level selectable (Note ②)

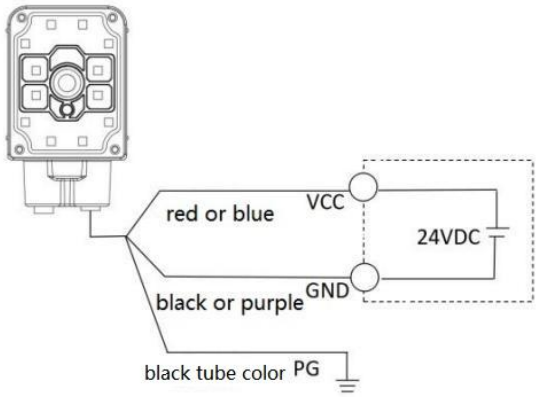
Black	PG	Frame grounding	

Note①: It depends on the voltage of the power adapter connected to the Serial port cable.
Note②: The effective level value can be set and defaults to 24VDC.

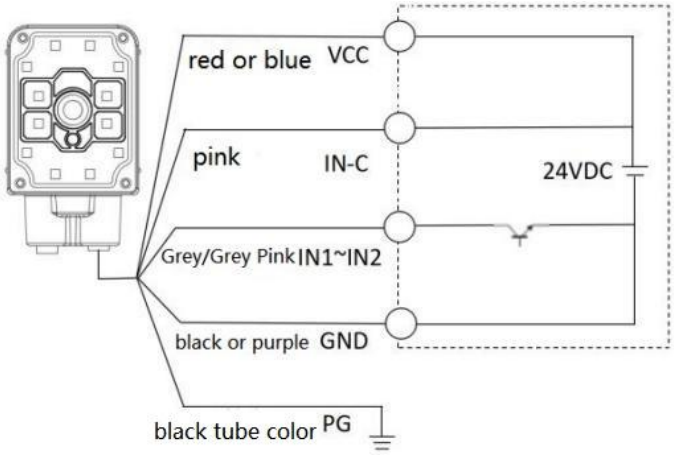
Please strictly follow the instructions when using I/O terminals. If external device is not connected according to the manual instructions or if the connection of external device exceeds the specified limit of load, it may cause damage to the product itself and inability to enjoy warranty and repair services.

2.4 Wiring according to purpose

2.4.1 I/O terminals wiring for power supply



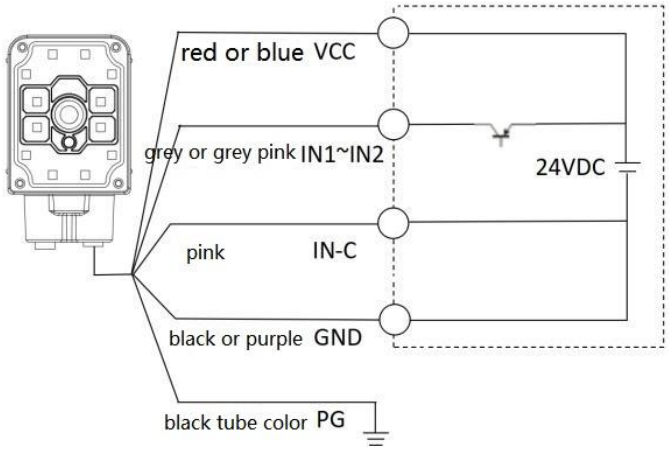
2.4.2 NPN type photoelectric sensor triggering wiring



Select the NPN type, connect the IN-C terminal to the VCC firstly, then connect the photoelectric sensor to the relevant scattered wire terminals. The wiring sequence corresponds to the table below:

Photoelectric sensor	Signal terminal
Brown (+)	VCC
Blue (-)	GND
Black (OUTPUT)	IN1

2.4.3 PNP type photoelectric sensor triggering wiring

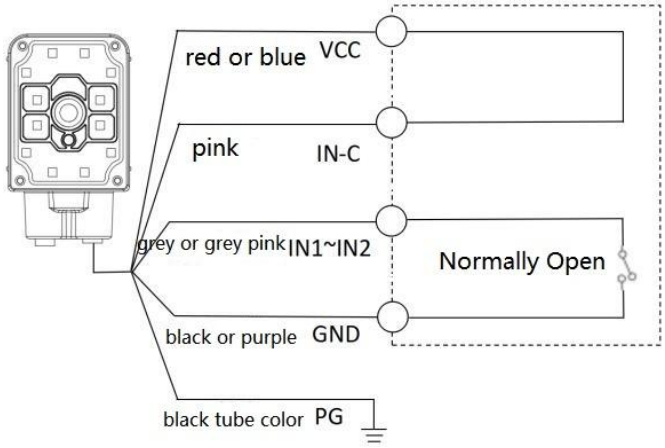


Select the PNP type, connect the IN-C terminal to GND firstly, then connect the photoelectric sensor to the relevant scattered wire terminals. The corresponding wiring sequence is shown as the table:

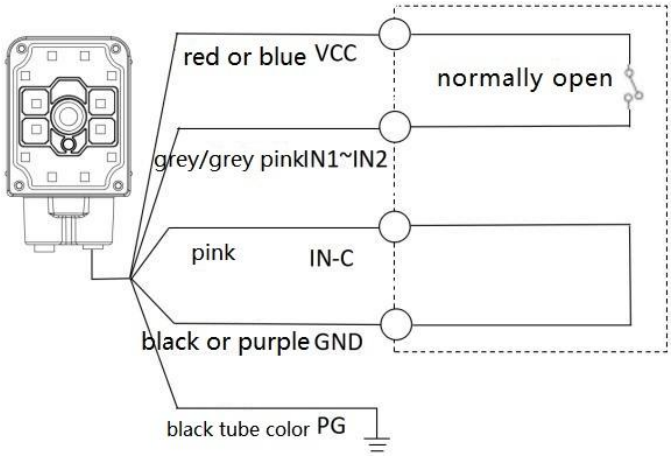
Photoelectric sensor	Signal terminal
Brown (+)	VCC
Blue (-)	GND
Black or other color (OUTPUT)	IN1

2.4.4 Switch and relay triggering wiring

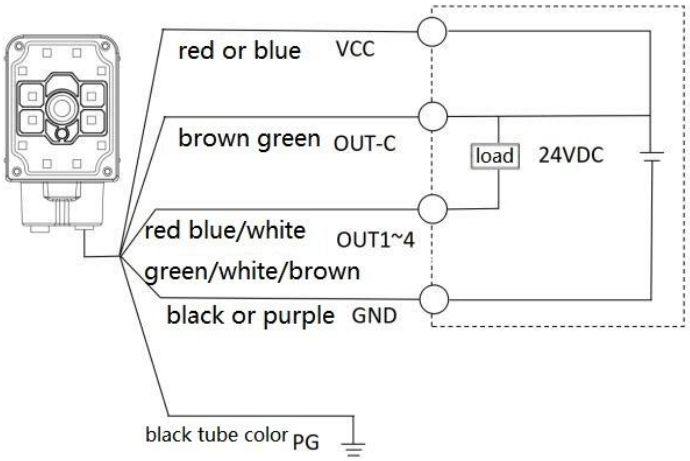
Method 1:



Method 2:



2.4.5 External load wiring



2.4.5.1 Taking NPN type alarm light as an example for wiring

The external load wiring needs to be set with logic, logic setting method: setting interface ->Input/Output Settings ->24V internal pull-up open, the scattered wire terminal VCC is connected to the OUT-C terminal, while the positive pole of the load is connected to the OUT-C terminal (taking the NPN type alarm light as an example), the negative pole is connected to the OUT1 and OUT2 output terminal. When reading succeeds, the green light lights up, when reading fails, the red light lights up and the alarm sounds. The corresponding wiring sequence is shown as following table:

External load (alarm light as an example)	Signal terminal
+ (Power input wire)	OUT-C
- (Green light control wire)	OUT1
- (Red light control wire)	OUT2
- (Buzzer control wire)	OUT2

2.4.5.2 Use relay as an example for wiring

Settings interface ->Input/Output settings ->24V internal pull-up open, connect the VCC of the scattered wire terminal to the OUT-C terminal, while connect the relay coil terminal 1 to the OUT-C terminal, the coil terminal 2 to the OUT 2 output terminal. When reading fails, the relay operates. The corresponding table of wiring sequence is as follows:

Relay	Signal terminal
Coil terminal 1	OUT-C
Coil terminal 2	OUT2

Note: The total maximum operating current of the output terminal load is 200mA, for other currents, please ask Bilin Intelligence's technical support personnel for help.

If external device is not connected according to the manual instructions or if the connection of external device exceeds the specified limit of load, it may cause damage to the product itself and inability to enjoy warranty and repair services.

3 Installation and Angle Adjustment

3.1 Before installation

Please pay attention to the following items and check the installation conditions:

1.No influence of ambient light;

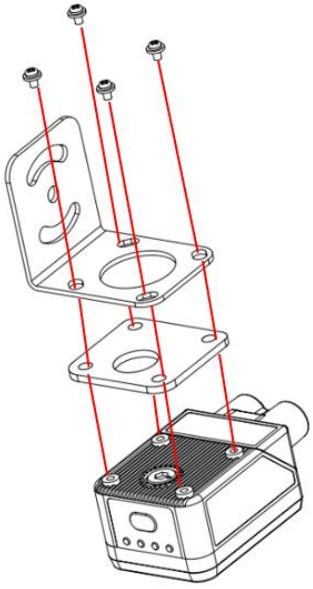
Please avoid sunlight, other lighting, photoelectric sensors, and other ambient light entering the light receiving area of FV105, otherwise it may cause unstable reading or reading errors.

2.Check if the light source of the barcode reader is obstructed;

If the light source is obstructed, the barcode may not be detected.

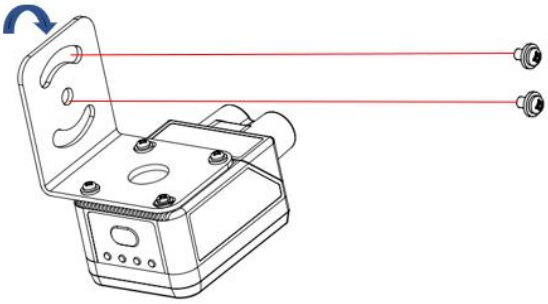
If there are other devices emitting strong light (direct and reflected light) on site, please set up a light shield to prevent such strong light from damaging the barcode reader or causing unsuccessful code reading.

3.2 Installation of L-shaped metal fixing plate and acrylic insulation sheet



Use the installation bracket to obtain the most suitable reading position. The most common installation method is showed in the figure. The installation position of the L-shaped metal fixing plate can be adjusted according to actual needs (the model showed in the above figure is FV104).

3.3 Angle adjustment

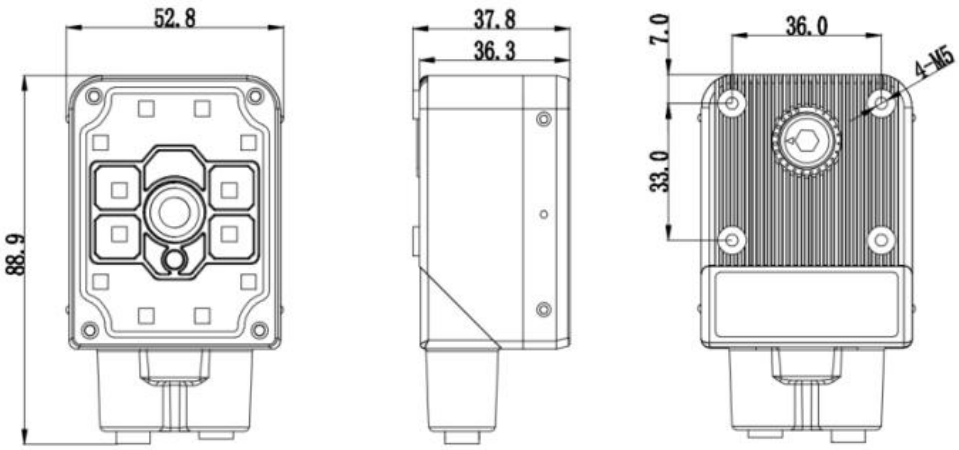


As shown in the figure, adjust the angle of the device to an appropriate angle position, then fix the L-shaped fixing plate firmly with screws.

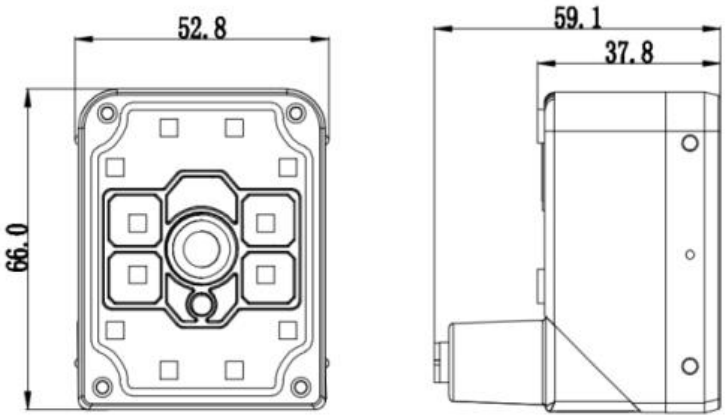
3.4 FV10X Dimensions

(Unit: mm)

General status



Rotate 90°



Note: The dimension of FV104 is same as that of FV105.

3.5 Reading range data sheet

(Unit: mm)

Typical barcode reading distance

Barcode specifications	FV104		FV105S		FV105N		FV105L	
	Nearest	Farthest	Nearest	Farthest	Nearest	Farthest	Nearest	Farthest
3.34mil Code 128	25	121	50	228	50	108	50	337
5mil Code 128	20	202	50	342	50	162	50	505
6.67mil Code 128	20	270	50	456	50	216	50	674
10mil Code 128	25	404	50	684	50	324	50	1010
15mil Code 128	40	607	50	1026	50	487	50	1516
5mil DataMatrix 10-bit	25	110	50	186	50	88	50	275
6.67mil DataMatrix 10-bit	25	147	50	248	50	118	50	367
10mil DataMatrix 10-bit	25	220	50	373	50	177	50	551
15mil DataMatrix 10-bit	25	331	50	559	50	265	50	827

Visual field

Reading distance	FV105S		FV105N		FV105L	
	X-axis visual field	Y-axis visual field	X-axis visual field	Y-axis visual field	X-axis visual field	Y-axis visual field
50	24.5	18	42	32	17	12.8
100	45	34	85	63	29	22
150	65	48	126	93	42	32
200	85	64	167	124	55	42
300	126	94	248	183	81	61
500	208	156	400	300	133	101
1000	408	305	790	590	268	202

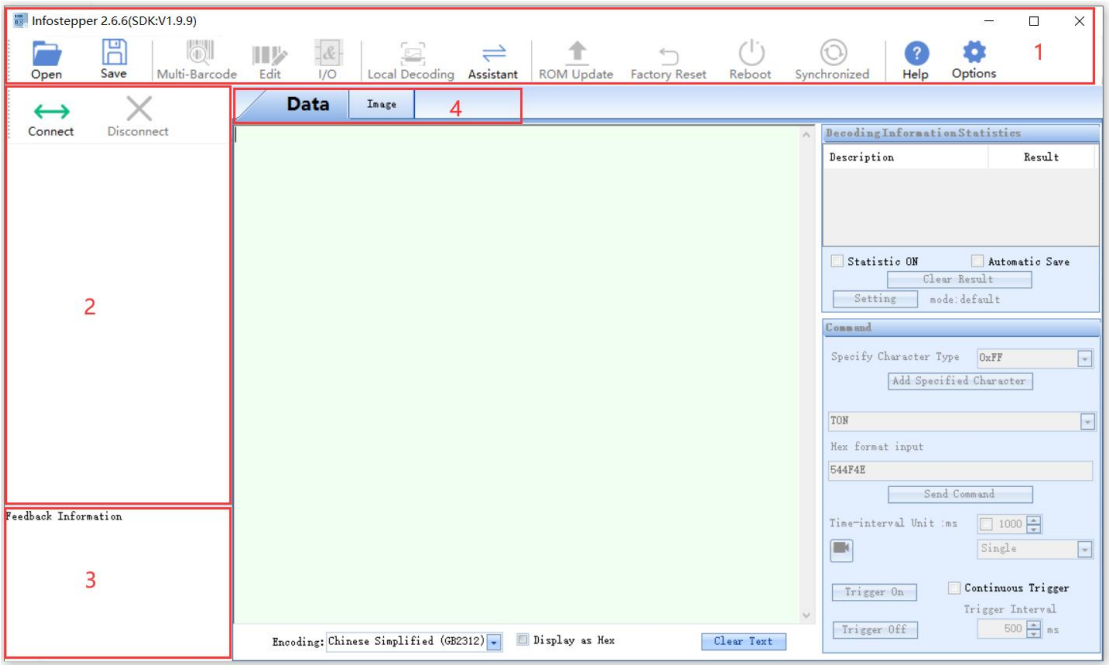
Reading distance	FV104	
	X-axis visual field	Y-axis visual field
50	33	24
100	65	48
150	95	70
200	130	95
300	189	108
400	250	187

4 Connecting FV10X by Configuring Software “infostepper”

“infostepper” Download address:
https://www.infoscan-cn.com/download/software

Unzip the file and run "infostepper. exe".

4.1 infostepper Modules introduction

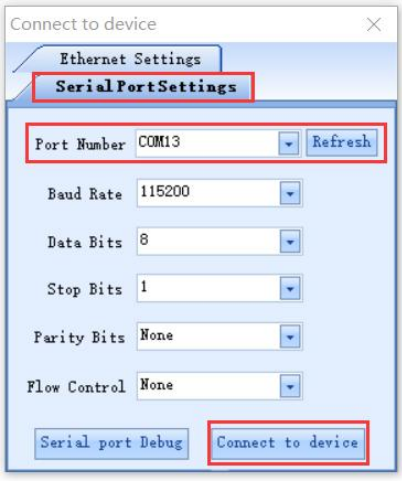


No.	Description
1	Normal toolbar
2	Connecting mode and information display
3	Feedback information
4	Setting (settings after connection, see details in Chapter 6)

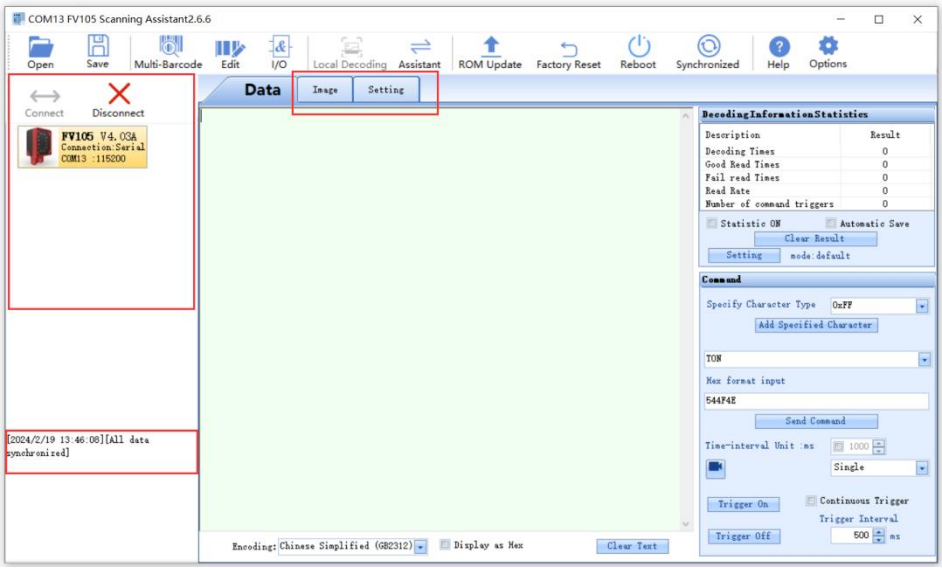
4.2 Connecting way of infostepper

4.2.1 RS232 Serial port connecting mode

After connecting the device directly to the computer's Serial port, check "Device Manager" -> "Port". After confirming the port number, click "Connect" when connecting to the software and the "Connect to device" window pops up. Select "Serial Port Settings" and select the corresponding COM number under "Port Number". If the COM number is not displayed, you can click the "Refresh" button to search; The "Baud Rate", "Data Bits", "Stop Bits", etc. are consistent with the device; As shown in below figure:



Click "Connect to device", after successfully connecting, the device will sound a buzzer prompt, as shown in the figure:



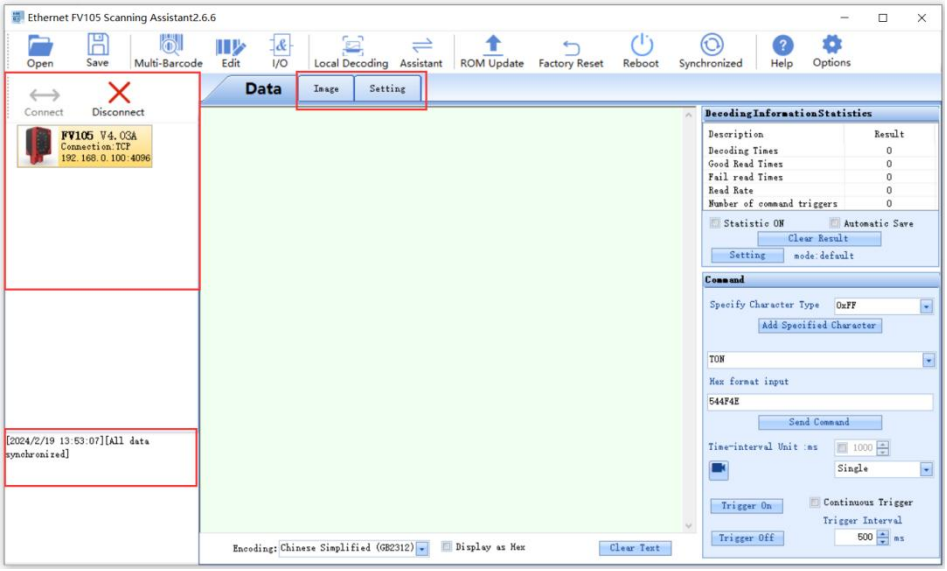
Note: Display the device model and version information, connection method, Serial port number, baud rate, and other information; The feedback information section displays the connecting date, time and other relevant information; After successful device connection and

interaction, you can click "Image" or "Setting" to set up in details for the bar code reader. (In “Image”, due to the limitation of Serial port transmission speed, the "Continuous shooting" function cannot be used.)

4.2.2 Ethernet (TCP/IP) connecting mode

After the device is directly connected to the computer, firstly, modify the IP address parameters of the computer through the following path: "Control Panel" → "Network and Internet" → "Network Connections" → "Ethernet Properties" → "TCPIPv4 Properties" → "Use the following IP address", so that the IP of computer and device (default 192.168.0.100) are in the same network segment. Click "Connect" to open "Connect to device" window, select "Ethernet Settings", select “Network Card” of this computer, and the current device will be automatically found under this network card as follows:

After clicking "Connect to device" and successfully connecting, the device sounds a buzzer prompt, as shown in the figure:

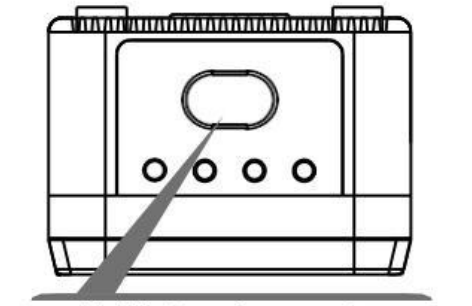


Note: After the device is successfully connected, the device model, version information, connecting mode, IP address and port number information will be displayed; The feedback information section displays the date, time and other related information of the connection; After

successful connection and interaction, you can click "Image" or "Setting" to set up in details for the barcode reader.

5 Quick Set FV105

FV105 is an autofocus device that provides quick settings. As shown in the figure below, place the bar code sample that needs to be read within the field of view. Press and hold the button for 10 seconds to perform automatic focusing first. After successful automatic focusing, enter automatic parameter adjustment (FV104 is a manual focusing device, pressing and holding of the button for 10 seconds only can perform automatic parameter adjustment). There is a buzzer and indicator light indicating the success or failure of autofocus and automatic parameter adjustment. The success or failure of automatic parameter adjustment is closely related to the quality of the barcode being read. When the barcode quality is good, the success rate of automatic parameter adjustment is high and the automatic parameter adjustment process is fast.



Press and hold the button for 10 seconds to start automatic focus and automatic parameter adjustment

Note: In “Image” interface of the software “infostepper” , the automatic focusing and automatic parameter tuning can also be achieved, as shown in Chapter 6.

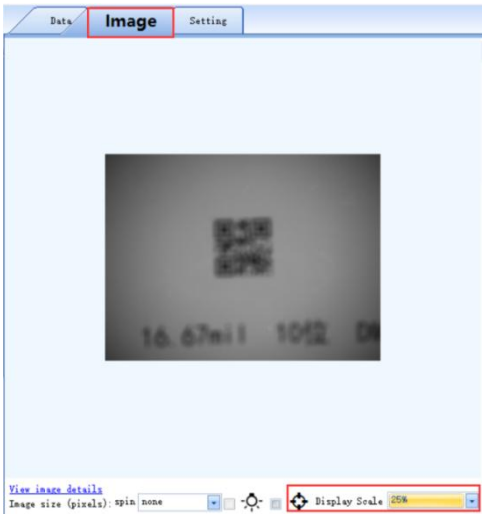
6 Set FV10X in Detail by Configuring Software “infostepper”

6.1 How to check the image

1.Select "Image";

2.Method 1: Click "Image snap";

3.On the "Image" main interface, you can check the captured image;



The captured image in the example is severely blurred, which affects decoding. It is necessary to adjust the focusing parameters of the reader. The display ratio can be adjusted according to needs.

4.Method 2: Click "Continuous shooting" to check the captured images in real-time (recommended).

Note: The "Continuous shooting" function only supports Ethernet connection.

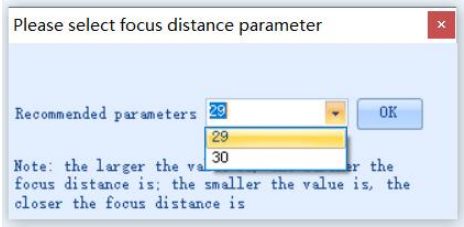
6.2 How to set focusing to make the image clear

FV105:

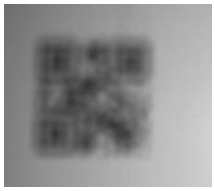
1.Method 1: Select “Imaging Monitor” and click "Autofocus";

2. “Autofocus” dialog box pops up;

3.After successful autofocus, a dialog box pops up, select the “Recommended parameters” , click “OK” ; There may be multiple recommended parameters for choice, which can be selected from the drop-down menu;



4.After successful autofocus, we automatically enter “Continuous shooting” mode. As shown in below image, the barcode area of the image is blurry before autofocus. After successful autofocus, the barcode area of the image is clear, and a green border appears around the barcode, indicating that the barcode can be decoded normally;



Before Autofocus

After Autofocus

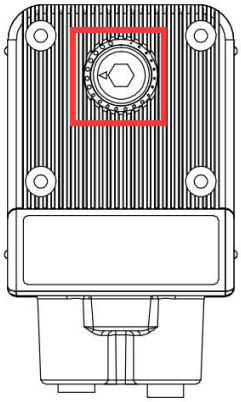
5.Method 2: Click "Continuous shooting". In "Image Settings", modify "Focus Distance" to check and adjust the image clarity in real time.

Note: The above operation can achieve the setting of image focusing clarity for FV105 barcode reader. If the barcode reading environment changes, please perform focusing again.

FV104:

1.Method 1: Select “Imaging Monitor” and click “Continuous shooting”;

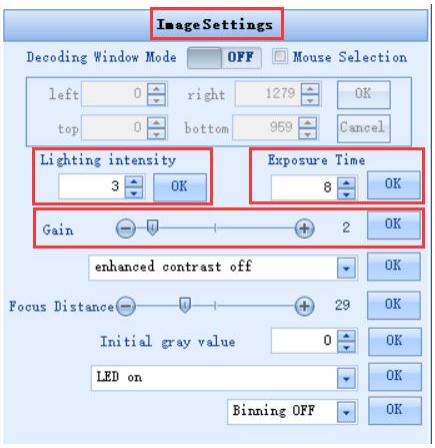
2.The current shot images are displayed in real time. If the image is blurred, use the attached hex wrench to adjust the focus tuning knob and check the real-time focusing status from the image until it is clear;



Note: The above operations can achieve the setting of image focusing clarity for barcode reader FV104. If the barcode reading environment changes, please perform focusing again.

6.3 How to set image parameters

1.Select "Continuous shooting" and check "Image Settings";



2.Method 1: Adjust the parameters of "Lighting intensity", "Exposure Time", "Gain" and check the barcode image changes in real time, as the picture shown below. When the lighting intensity is set to 0, the image is dark, when the lighting intensity is set to 2, the image becomes significantly brighter and the sample barcode appears with a green border, which means the barcode can be successfully decoded;

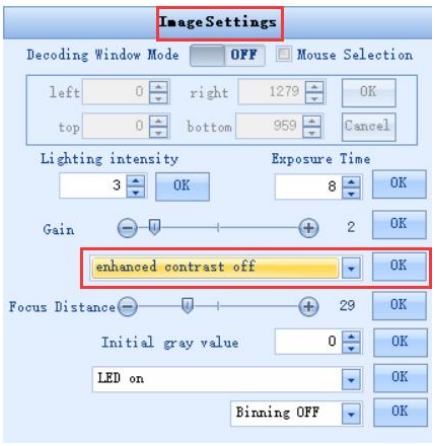
Lighting intensity is set to 0

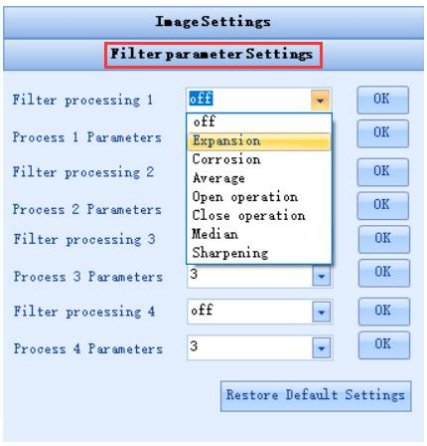
Lighting intensity is set to 2

3.Adjust "Exposure Time", check the image changes in real time, the brightness of the image will change significantly, and the contrast of the image will also change significantly. In static code reading applications, the exposure time has a relatively small impact on the success rate of barcode reading; In dynamic reading applications, the exposure time has a significant impact on the success rate of reading. The "Exposure Time" parameter can be calculated based on barcode size and other parameters;

4.Adjust "Gain", check the changes of the image in real time, the brightness and contrast of the image will change significantly;

5.The reading application of special barcodes requires adjusting the filtering parameters such as contrast.



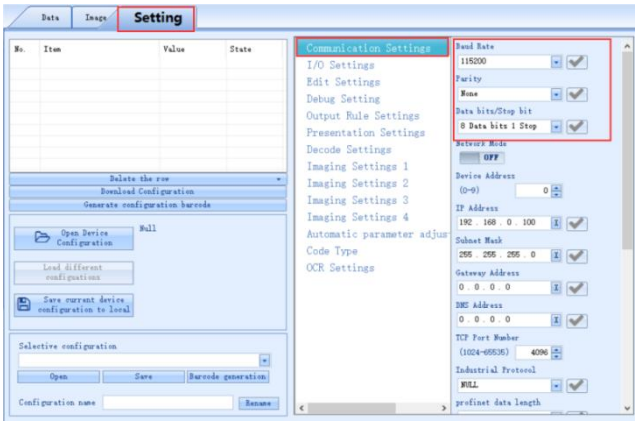


Note: The confirmation and adjustment of image parameters are according to the specific feature of the barcode to be read. The general adjustment method is an adjustment combination of "lighting intensity", "exposure time", "gain" and “filter parameter settings” , in order to meet different barcode reading scenarios.

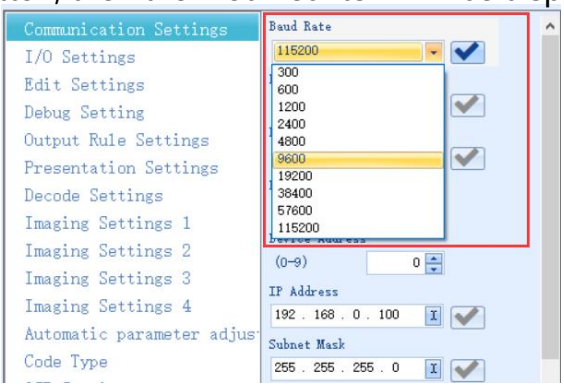
6.4 How to set up Serial port connections according to needs

Only standard RS232 can be supported by model FV10X.

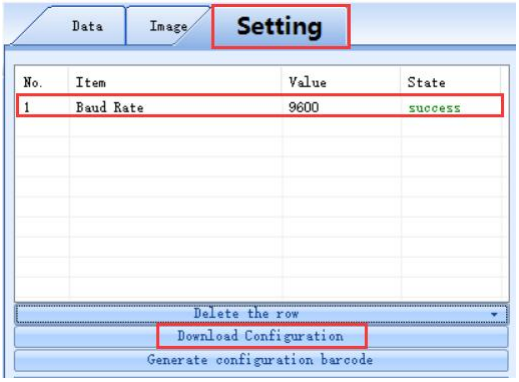
1.Select "Setting" and select "Communication Settings";



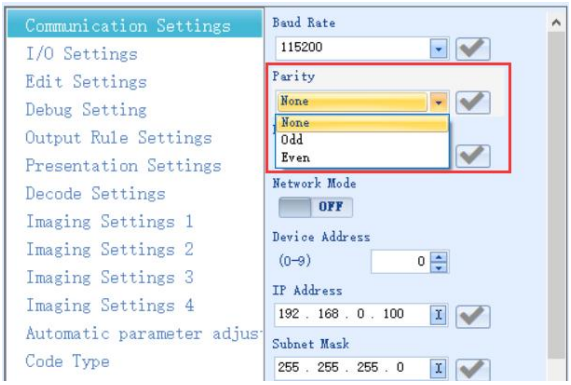
2."Baud Rate", "Parity" and "Data bits/Stop bit" can all be set according to needs. Taking baud rate setting as an example, set the baud rate to 9600, select "9600", click "√" button, then the modified item will be displayed in the setting list;



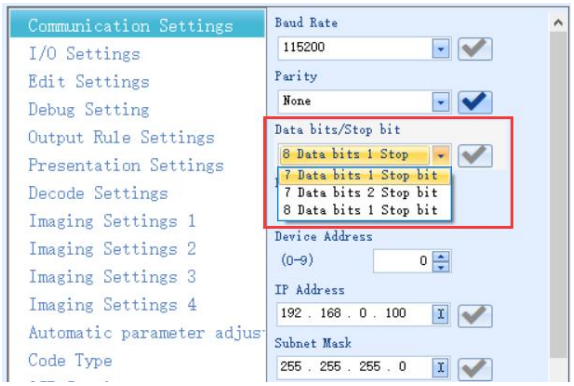
3.Click "Download Configuration". If the setting is successful, the buzzer of the reader will provide feedback, the setting status in the list displays "success", indicating that the baud rate has been set successfully;



4.Likewise, select "Parity" according to needs, click " √ " button and the selected Parity will appear in the setting list. Click "Download Configuration" to proceed;



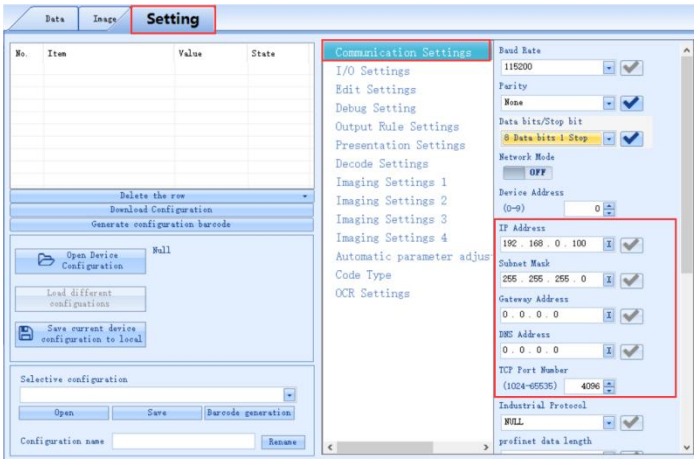
5.Likewise, select "Data bits/Stop bit" according to needs, click "√" , then the selected type of Data bits/Stop bit will appear in the setting list. Click "Download Configuration" to proceed.



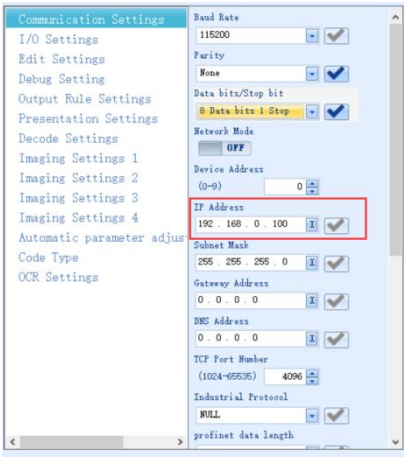
Note: If the "Data bits/Stop bit" is set to a non-default state, then "infostepper" is incapable of connecting with the barcode reader.

6.5 How to set up Ethernet connection according to needs

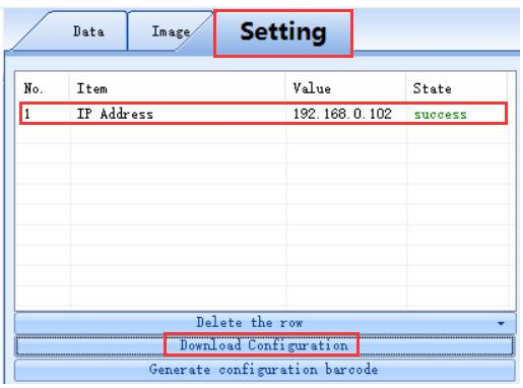
1.Select "Setting", select "Communication Settings";



2. “IP Address”, “Subnet Mask”, “Gateway Address”, “DNS Address” and “TCP Port Number” can be set according to needs. Taking IP Address as an example, the IP address can be entered directly from the keyboard according to needs;



3.After inputting the IP address, click "√" button, then the set IP address will be displayed in the setting list. Click "Download Configuration" button and the reader buzzer will prompt for setting success. The “State” of Setting shows "success", indicating the setting is completed;

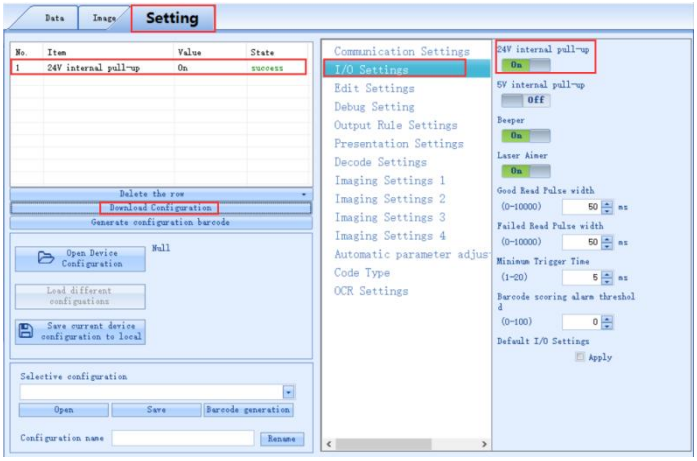


4. “Subnet Mask”, “Gateway Address”, “DNS Address” and “TCP Port Number” can be set as needed according to the setting method of “IP Address”.

6.6 How to set the output signal level and the continuous pulse width of the level

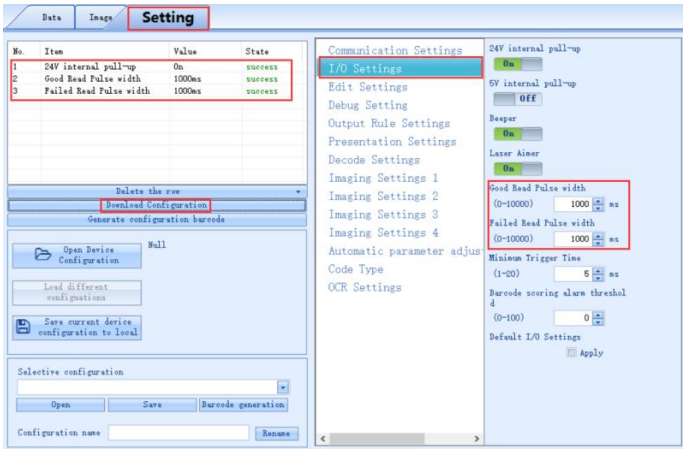
When the output common terminal OUT-C is empty:

1.The barcode reader FV10X provides two specifications of output level signal settings. Select "Setting", then select "I/O Settings". If "24V internal pull-up" is set to “On”, the output signal level is 24V;



2.I/O output logic, OUT1-OUT4 output level signals are all 24V. The default logic uses OUT1 and OUT2, so the default logic can only detect that OUT1 and OUT2 are 24V.
(For the hardware connection of output logic, please refer to Chapter 2 “Connection and Wiring”)

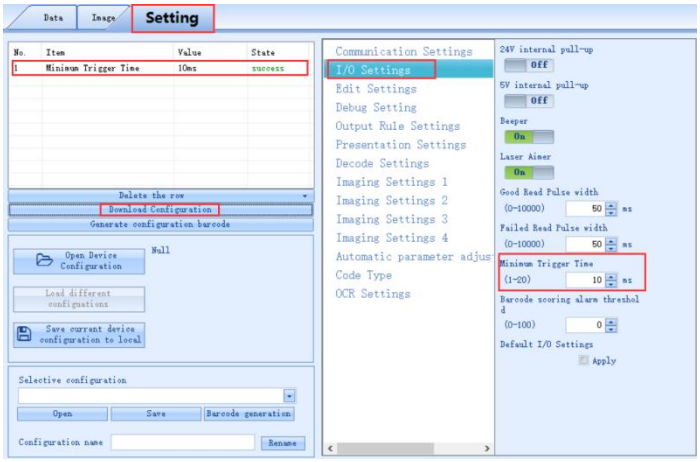
3.The default IO output logic is that OUT1 indicates successful reading, OUT2 indicates failed reading. The output level signal pulse width for both successful and failed reading is 50ms, and the signal pulse width can be set according to needs, with a maximum of 10000ms. After completing the settings according to needs, click "Download Configuration".



Note: OUT-C output common terminal is empty, set pull-up to be effective, OUT1-OUT4 are only electrical signals without load capacity; The OUT-C output common terminal is connected to VCC, and the pull-up is set to invalid. The initial voltage of OUT1-OUT4 is the voltage corresponding to VCC , and with a certain load capacity.

6.7 How to set the minimum effective triggering time

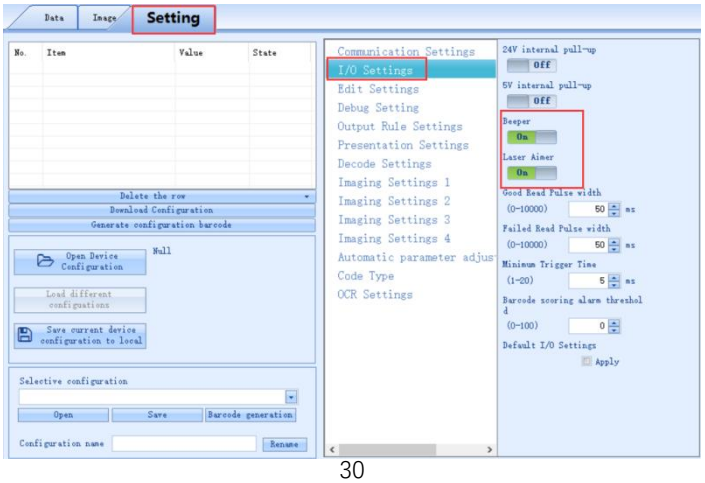
1.For barcode reader FV10X, the effectiveness of external trigger signals (such as photoelectric sensors) can be set according to needs. Select "Setting", select "I/O Settings", the default "Minimum Trigger Time" is 5ms, which can be set according to needs;



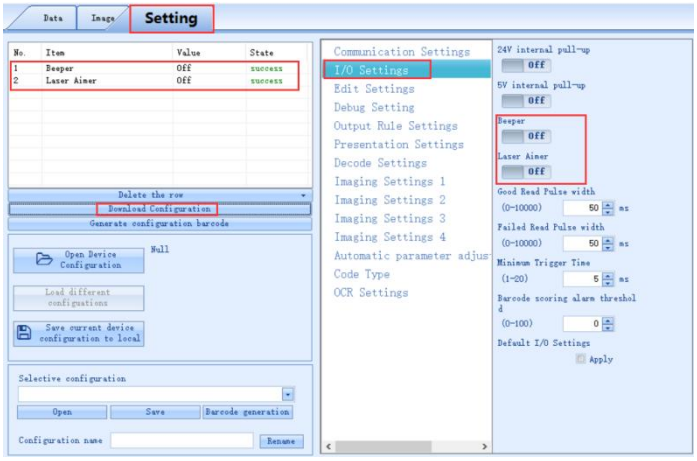
2.Click "Download Configuration" to complete the settings.

6.8 How to set the functions of buzzer and laser aiming when barcode reading is successful or failed

1. The barcode reader FV10X's buzzer (prompt for successful or failed barcode reading) and laser aiming function default to “On” state;

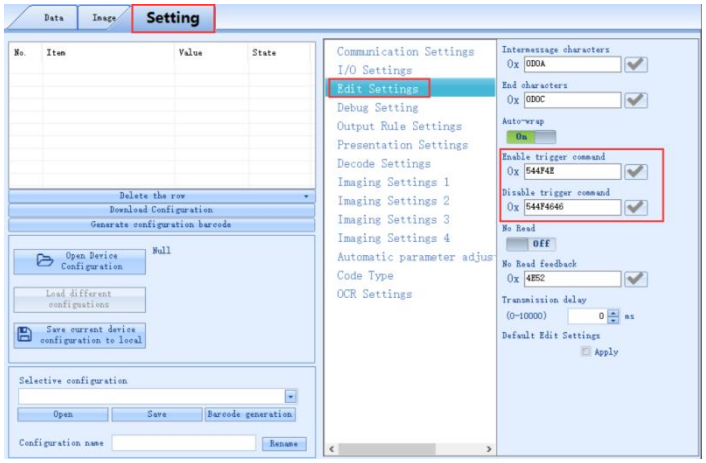


2.When the barcode reader FV10X succeeds or fails to read the barcode, the buzzer will prompt. The “Laser Aimer” function can be set to “Off” state according to needs. Click "Download Configuration" to complete the settings.

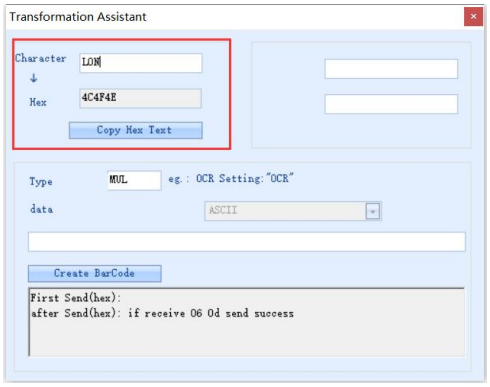


6.9 How to set trigger command and trigger cancel command for the reader

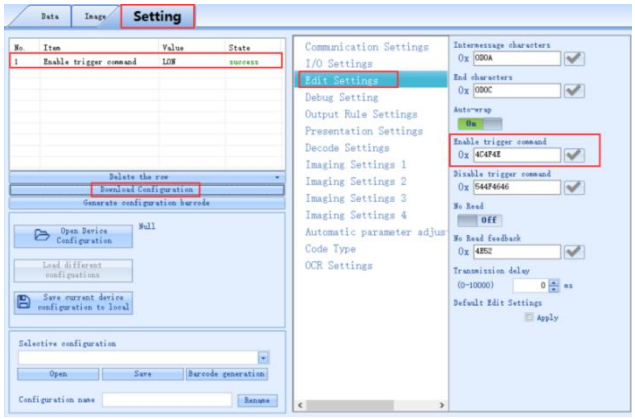
1.The barcode reader FV10X can respond to commands to control barcode reading. The default trigger command (hex) of the reader is "544F4E", the trigger cancel command (hex) is "544F4646", which can be checked in "Edit Settings";



2.Set trigger commands, for example, setting "LON" as the trigger command. Select the "Assistant" tool, entering “LON ”, then “LON” can be automatically converted to the corresponding hexadecimal “4C4F4E” ;



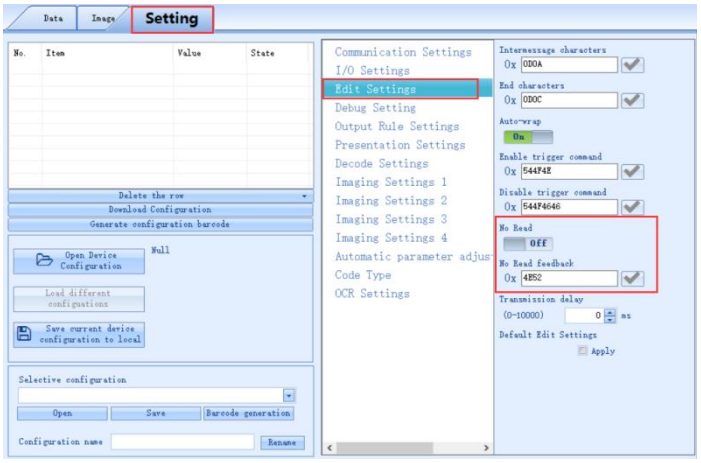
3.Click “Copy Hex Text”, then paste it into the "Enable trigger command", click "√" and check it in the Setting list, then click "Download Configuration" to complete the settings;



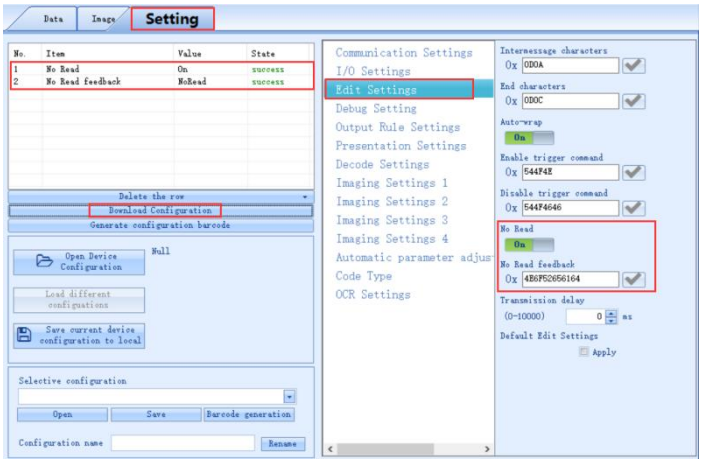
4.The “Disable trigger command” can be set as needed, according to the setting method of “Enable trigger command”.

6.10 How to set the feedback of reading failure

1.The barcode reader FV10X can output the feedback characters for failed reading. The default “No Read feedback” characters (the hexadecimal characters for failed reading feedback) are "4E52", and the switch of “No Read” (reading failure feedback) defaults to “Off” state. You can check it in "Edit Settings";

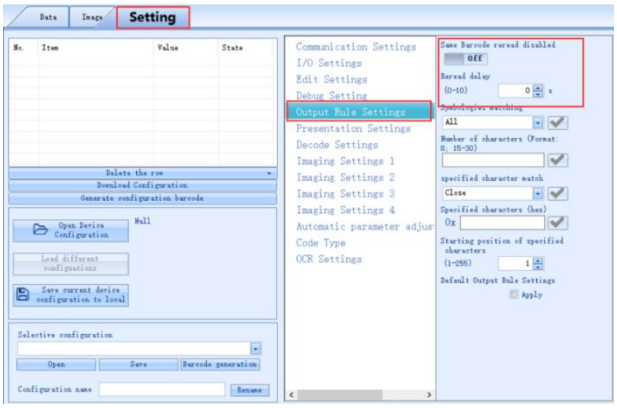


2.For example, set the switch of “No Read” to “On” state, set the “No Read feedback” to "NoRead". Use “Assistant” to convert "NoRead" to hexadecimal, paste the hexadecimal content into the “No Read feedback”, click “√”. Check the Setting list, click "Download Configuration", the setup is completed.

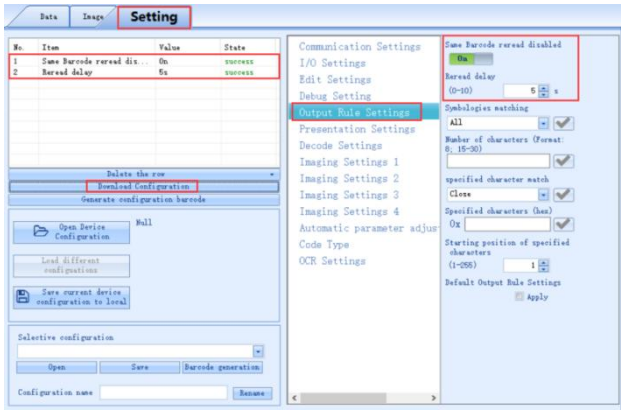


6.11 How to set up shielding for “Same Barcode Reread”

1.The barcode reader FV10X's “Same Barcode reread disabled” is “Off” by default, the “Reread delay” is set to “0” seconds by default; Check the settings in "Output Rule Settings";



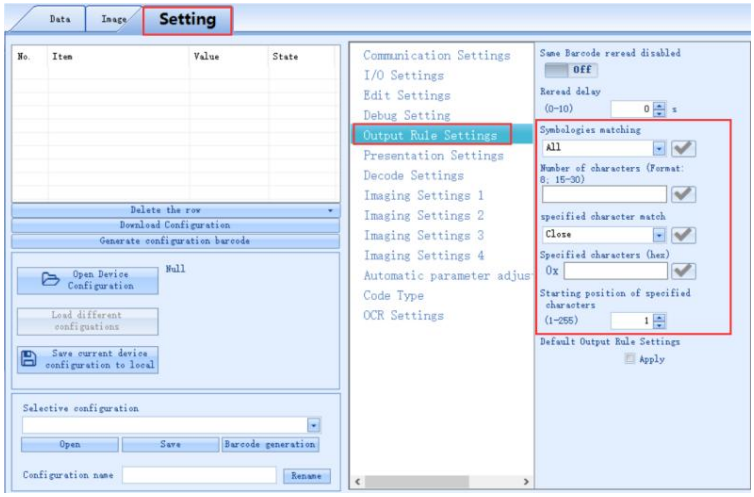
2.For example, the “Same Barcode reread disabled” is set to “On”, the “Reread delay” is set to "5";



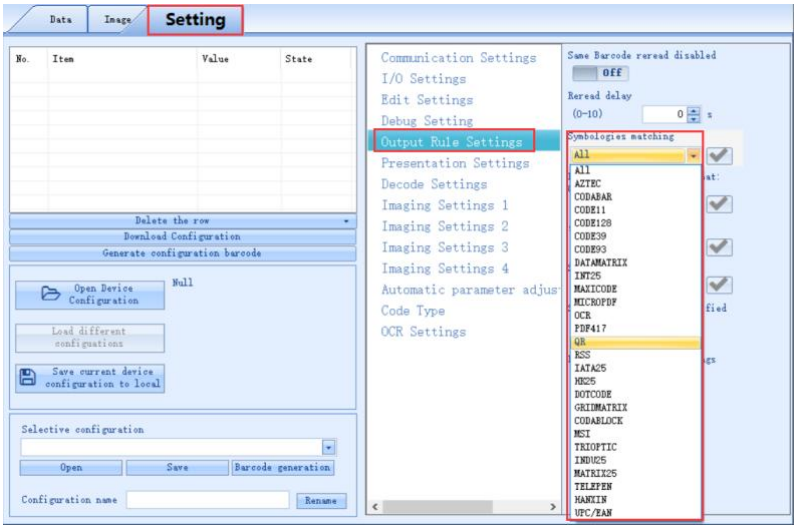
3.Setting the "Reread delay" to 5 seconds means that the function of "Same Barcode reread disabled" maintains 5 seconds; 0s means continuous shielding. When the current barcode reading is successful, the data is output. If the code symbology and data content of the subsequent barcode are consistent with that of the current successfully read barcode, the "Same Barcode reread disabled" continues to be maintained; If the subsequent code symbology or data is different from that of the current successfully read barcode, the "Same Barcode reread disabled" will not be performed.

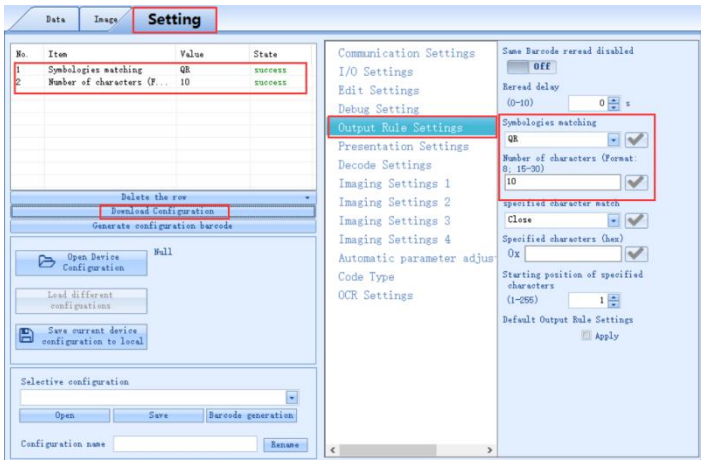
6.12 How to set barcode filtering criteria

1.If it is necessary to filter the output barcode, FV10X provides barcode filtering function, which can be set in "Symbologies matching", "Number of characters", "Specified characters", etc., so as to achieve the purpose of filtering;



2.For example, the output code symbology you need is QR code, 10 characters, the settings are as follows:

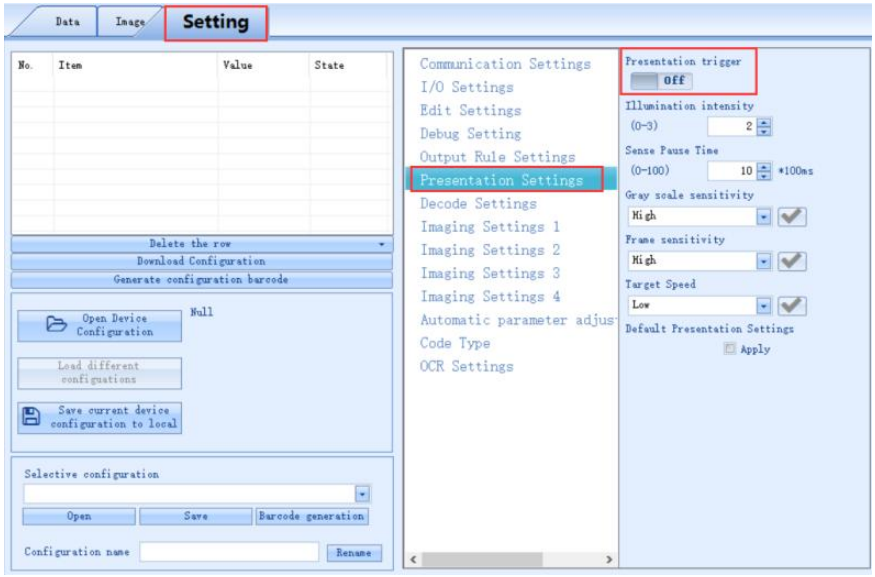




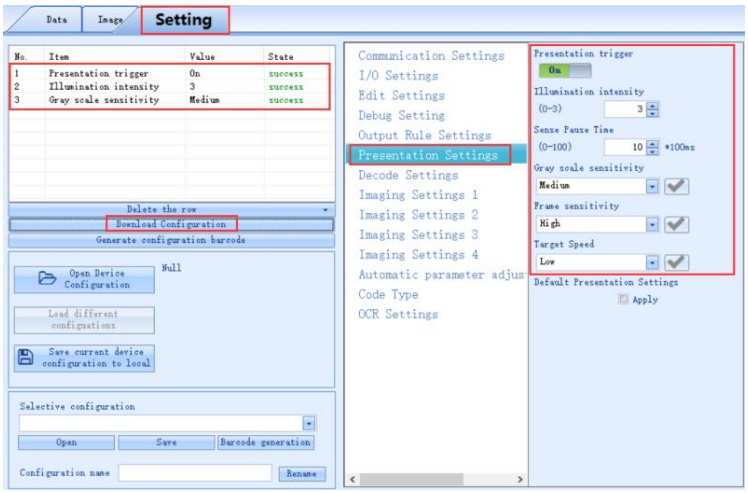
3. “Specified character match” can be set for filtering.

6.13 How to set up presentation mode

1.Barcode reader FV10X has a certain ability of presentation reading. The presentation mode set in “Presentation trigger” defaults to “Off” state, as follows;



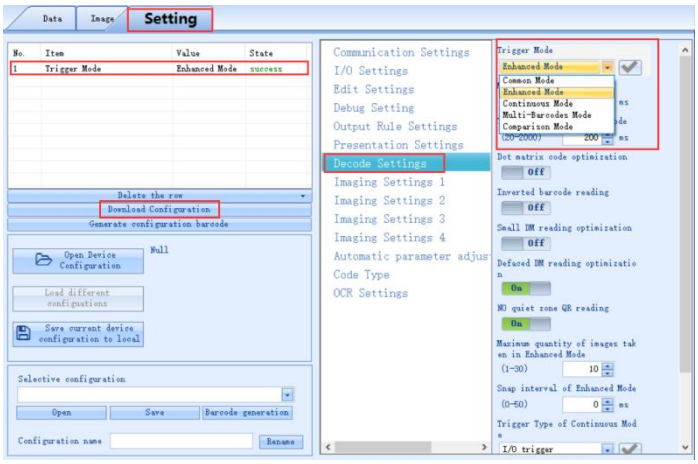
2.Set “Presentation trigger” to “On” . The “Illumination intensity” , “Sense Pause Time” , “Gray scale sensitivity” , “Frame sensitivity” , “Target Speed” etc., can be set;



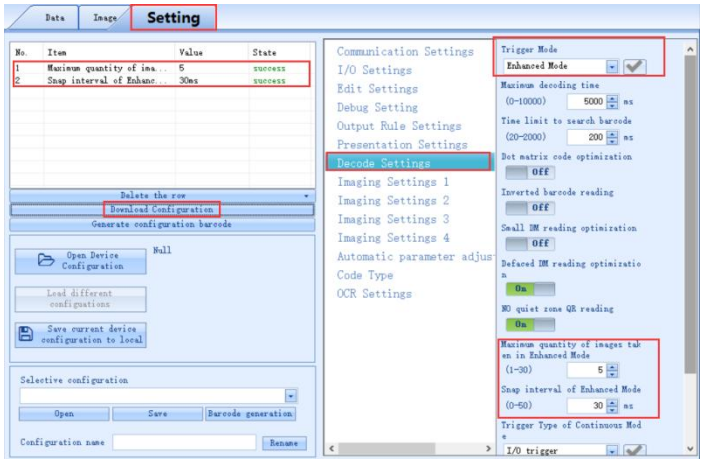
3.Reader FV10X’ s presentation mode is suitable for specific environments.

6.14 How to set the filtering conditions for high-speed and high-frequency dynamic reading in enhanced mode

1.The default decoding trigger mode of barcode reader FV10X is normal mode, which can meet most dynamic reading applications in the market. For high-speed and high-frequency dynamic reading applications, the “Enhanced Mode” can be selected. Check "Decode Settings" - "Trigger Mode" , select "Enhanced Mode" , click “√” button, then click "Download Configuration" to open the enhanced mode;

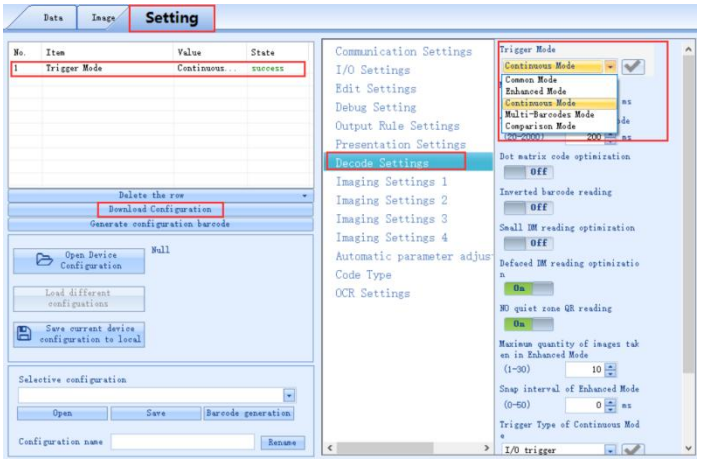


2.The “Maximum quantity of images taken in Enhanced Mode” is 10 by default, ranging from 1 to 30, which can be adjusted according to actual application needs; The default “Snap interval of Enhanced Mode” is 0, with values ranging from 0 to 50, which can be adjusted according to actual needs;

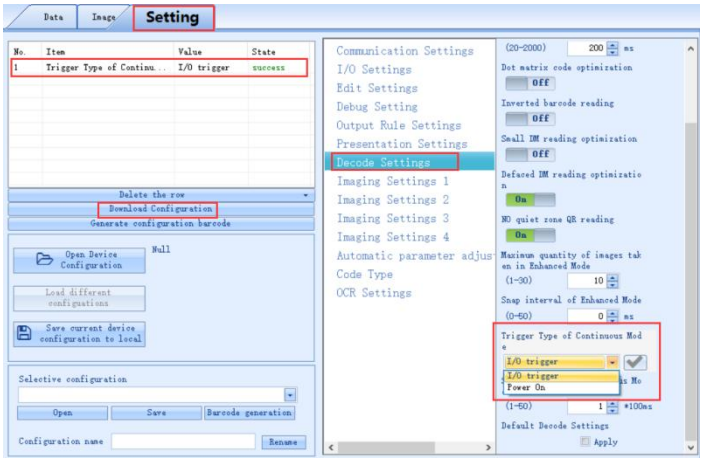


6.15 How to set filtering conditions for continuous triggering mode

1.In “Trigger Mode”，“Continuous Mode” can be selected;

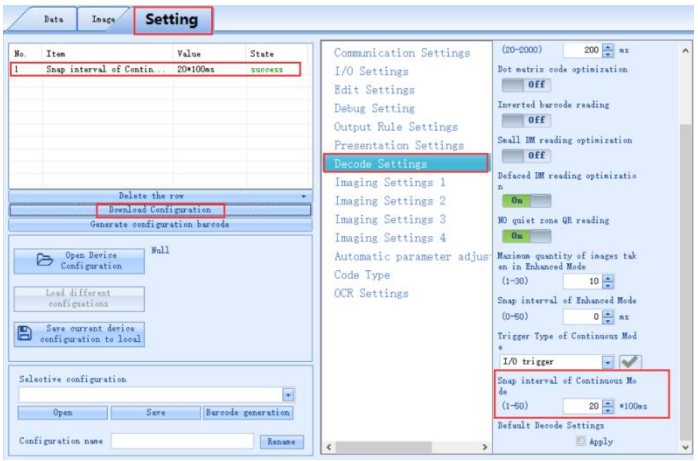


2.The trigger types of continuous triggering mode include “I/O trigger” and “Power On”, the default is I/O trigger;



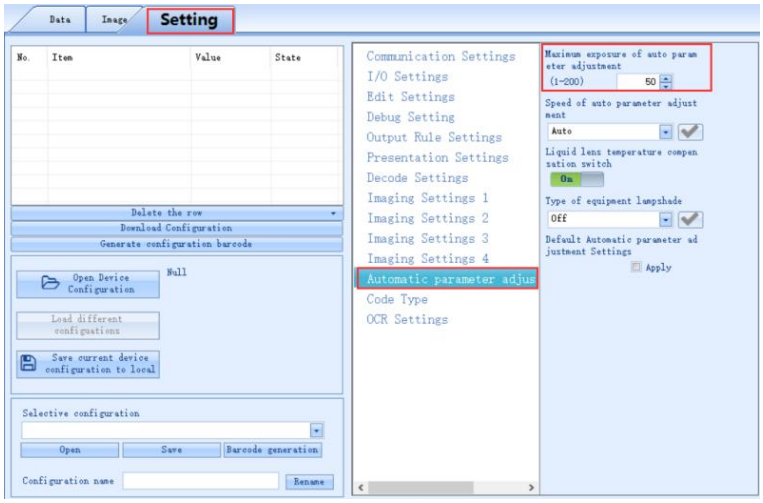
3.Snap interval time in continuous trigger mode

The default value of “Snap interval of Continuous Mode” is 0*100ms, you can set the value ranging from 1 to 50 according to the actual needs.

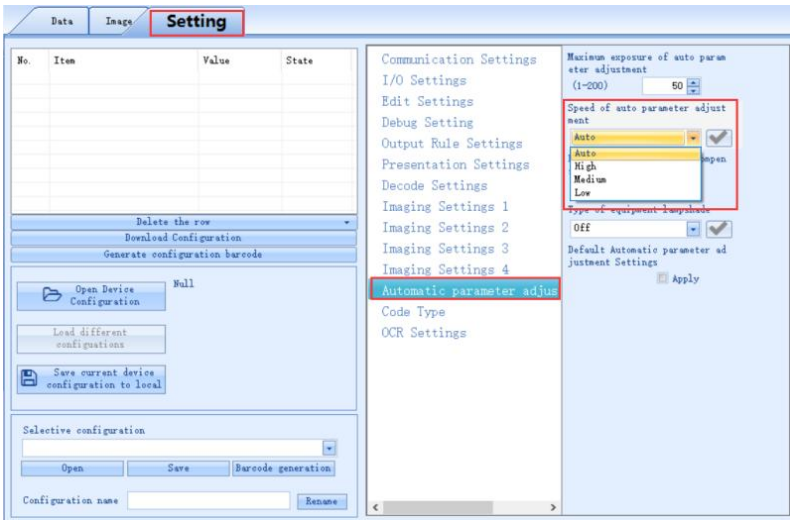


6.16 How to set filtering conditions for automatic parameter adjustment

1.The maximum exposure time for automatic parameter adjustment: Controls the maximum amount of light input. Check the setting of "Maximum exposure of auto parameter adjustment", the default value is 50 and the optional value range is 1-200, which can be set according to actual application needs;

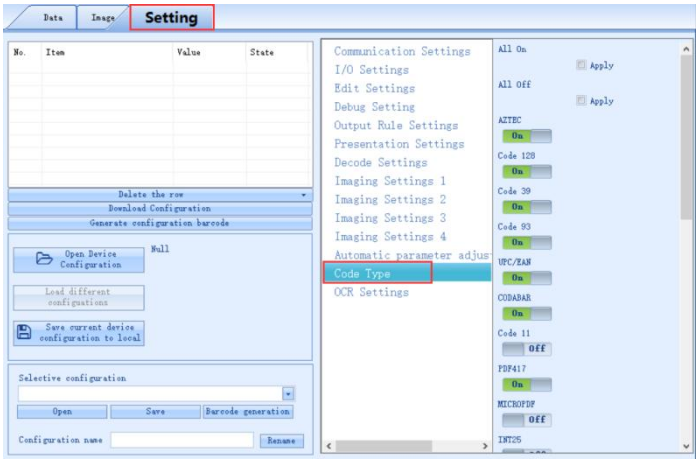


2.Setting of “Speed of auto parameter adjustment”: The default is “Auto”. Automatic, high-speed, medium-speed or low-speed can be selected.



6.17 How to set the code symbology filtering criteria for the tested barcode

1. “Setting” - “Code Type”;



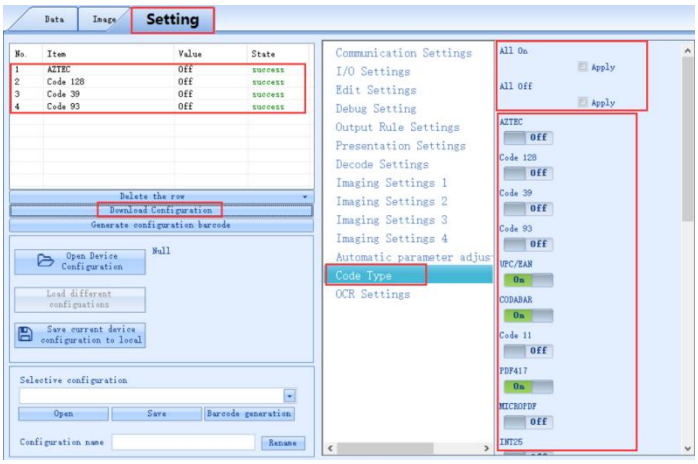
2. “Code Type” settings:

“All On”: Tick in the check box - Click “Download Configuration” - all code symbologies are on;

“All Off”: Tick in the check box - Click “Download Configuration” - all code symbologies are off;

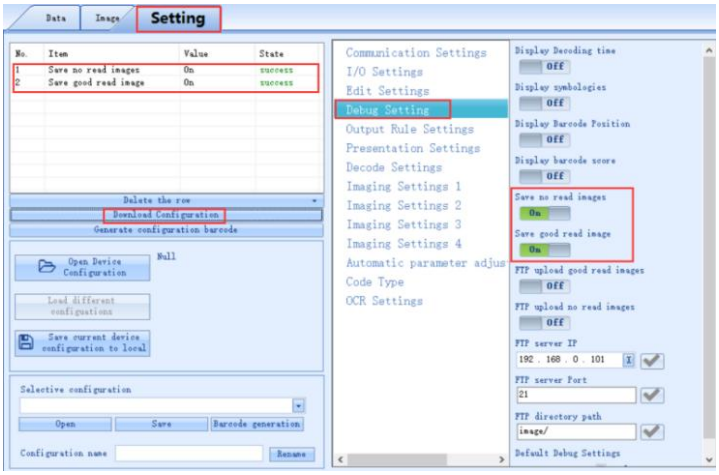
Each code symbology can be turned on or off separately, with corresponding switch button;

Non-essential code symbology can be turned off in application, so as to improve the decoding efficiency.



6.18 How to set to check images of Successful/Failed decoding

1.Enter “Setting” - “Debug Setting”, open “Save no read images” and “Save good read image”;

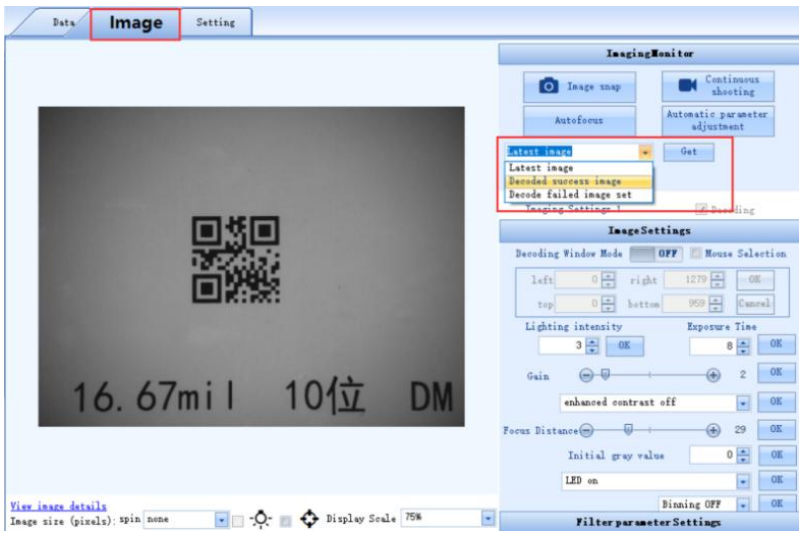


2.Enter “Image” interface - “Get” - Check “Latest image”, “Decoded success image” or “Decode failed image set”;

“Latest image”: The most recent images captured by the barcode reader (decoding success/failure);

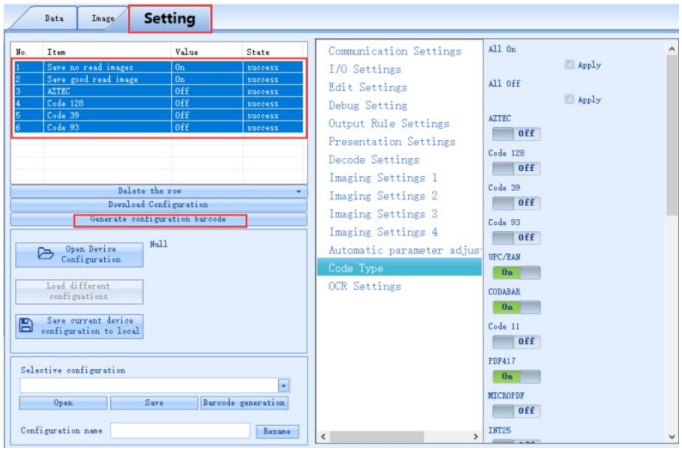
“Decoded success image”: The most recent image with successful decoding;

“Decode failed image set”: The most recent images of failed decoding.

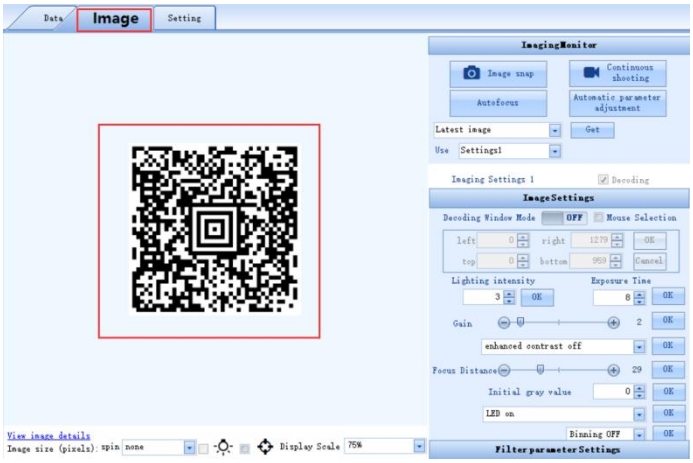


6.19 How to generate setting codes with setting items

1.After “Download Configuration” successfully, select the setting items as needed, click “Generate configuration barcode” to generate the setting code;

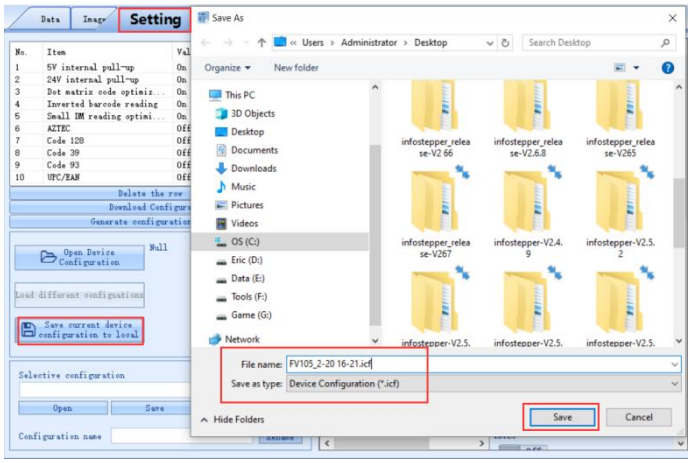


2.According to the prompts, you can paste it into a Word file or check it in Image interface (see the setting code below in “Image” interface), then use the barcode reader to scan the setting code to complete the parameters settings.

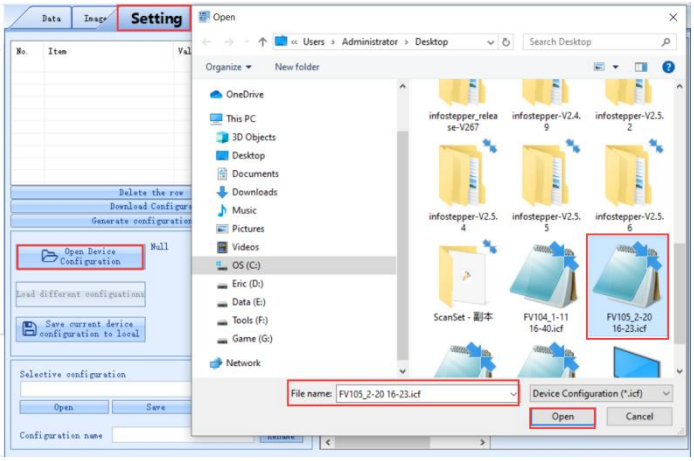


6.20 Saving and opening configuration files of setting items

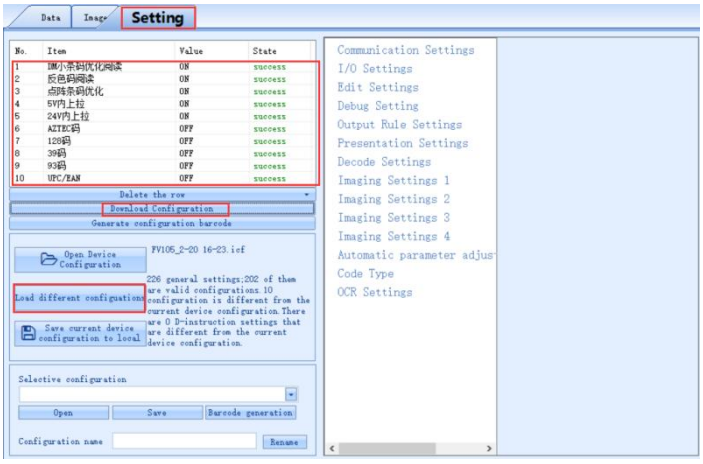
1.Saving the configuration file to local: In Setting interface, click on “Save current device configuration to local”；



2.Opening a configuration files: Click “Open Device Configuration” and select the corresponding configuration file;

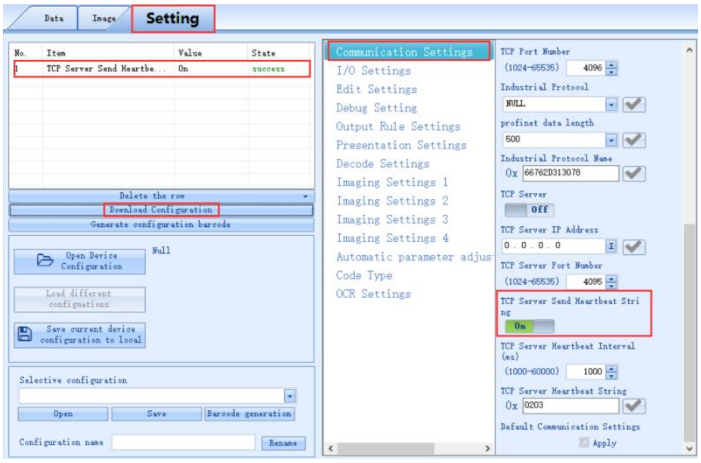


3.Select “Load different configurations”，then you can check the setting items in the Setting list. Click "Download Configuration" to complete the quick import of local configurations.

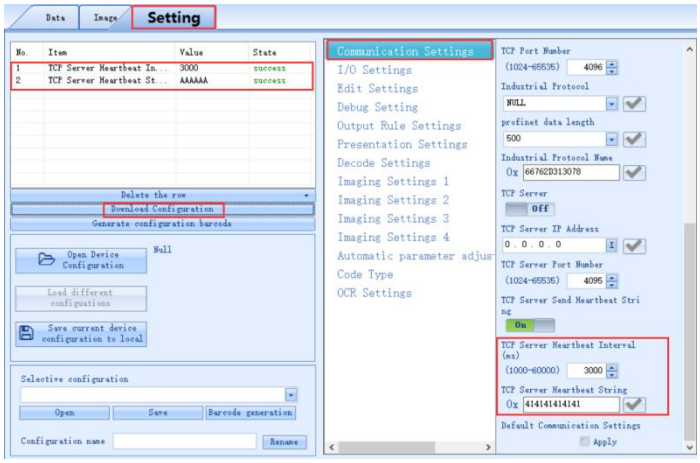


6.21 How to set heartbeat string

1.In "Communication Settings", set "TCP Server Send Heartbeat String" to "On", then this function is activated; After 20 seconds, the string will be sent at default interval time;



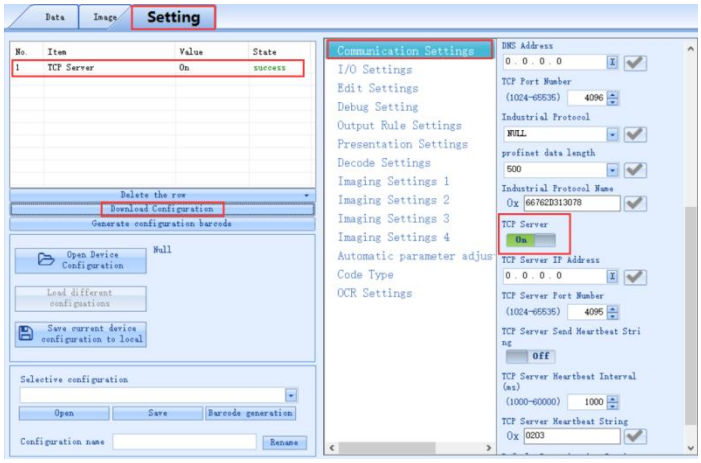
2."TCP Server Heartbeat Interval (ms)" and "TCP Server Heartbeat String" can be set according to needs. The heartbeat string can be set to a maximum of 6 characters;



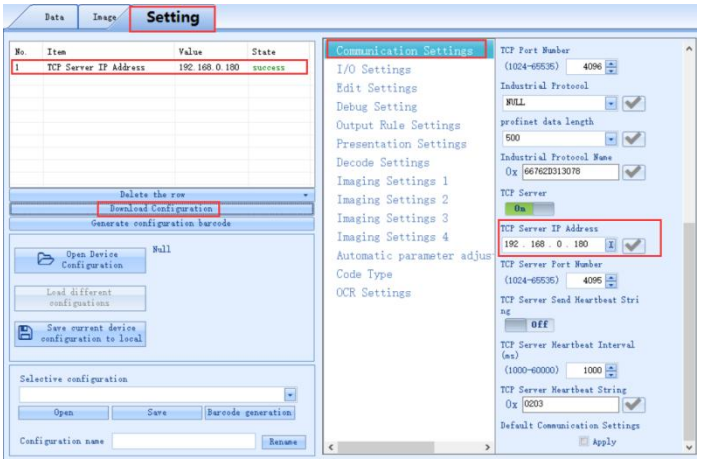
Note: The heartbeat string function is only used to detect whether the device is connected. If not necessary, simply maintain the default state (“Off” state).

6.22 How to set Client mode

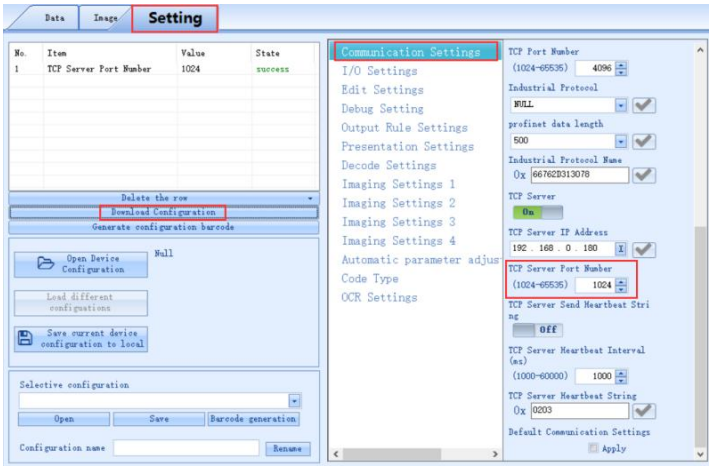
1.In "Communication Settings", set "TCP Server" to "On" to enable this function; (This function requires the Server to disable the firewall)



2.The "TCP Server IP Address" needs to be set as the IP address of the PC (the PC receives data);



3. "TCP Server Port Number" can be set as needed. The parameter setting range is 1024 to 65535.



6.23 How to use automatic parameter tuning to adjust image parameters

1.Connect to infostepper via Ethernet and select "Image";

2.Click "Continuous shooting" to enter real-time shooting mode;

3.Check the real-time images captured; Place the barcode at the center of the Image interface, ensuring the barcode is in reader's field of view; Perform the focusing operation. For specific focusing operations, you can refer to the content in Chapter 6.2;

4.After focusing, check the image and ensure it is in a relatively clear status; Perform "Stop continuous shooting" ;

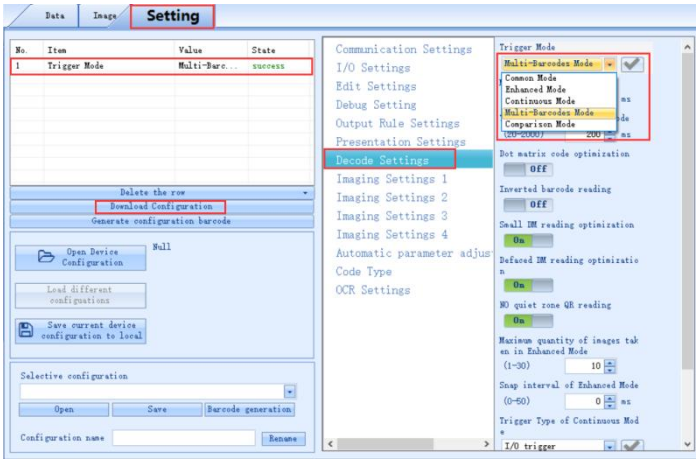
5.Perform "Automatic parameter adjustment". During the automatic parameter adjustment process, you can find the image is changing in real-time until the automatic parameter adjustment is completed. If the automatic parameter adjustment is successful, it will automatically enter the "Continuous shooting" which is a real-time image checking mode. A green or red border will appear around the barcode which has been successfully read; If the automatic parameter adjustment fails, you can find the failure prompt in feedback information window;

6.During the automatic parameter adjustment process, the automatic parameter tuning operation can be paused at any time as needed; This function meets most of the barcode reading needs; For barcodes in special states, it is recommended to manually adjust the image parameters according to actual situation.

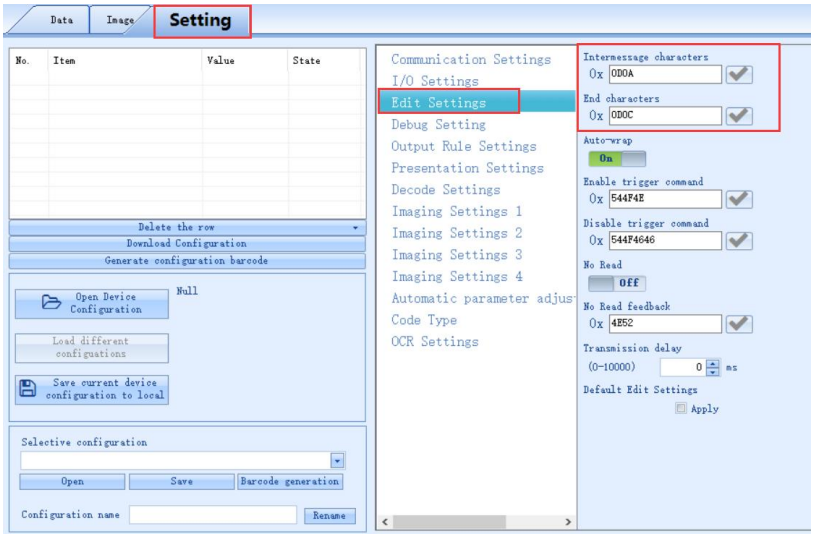
7 Settings for Special Applications

7.1 How to setup multi-barcode mode and multi-barcode reading rules

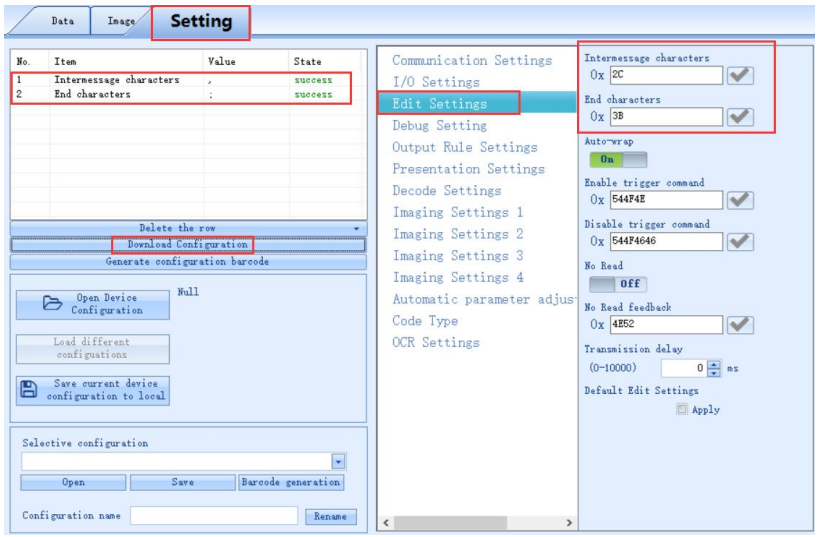
1.The "Multi-Barcodes Mode" of reader FV10X can be selected in Setting - Decode Settings - Trigger Mode;



2.Multiple barcode interval characters and end characters can be set in "Setting" - "Edit Settings" - "Intermessage characters" and "End characters". The default "Intermessage characters" (hex) is 0D0A, the default "End characters" (hex) is 0D0C;

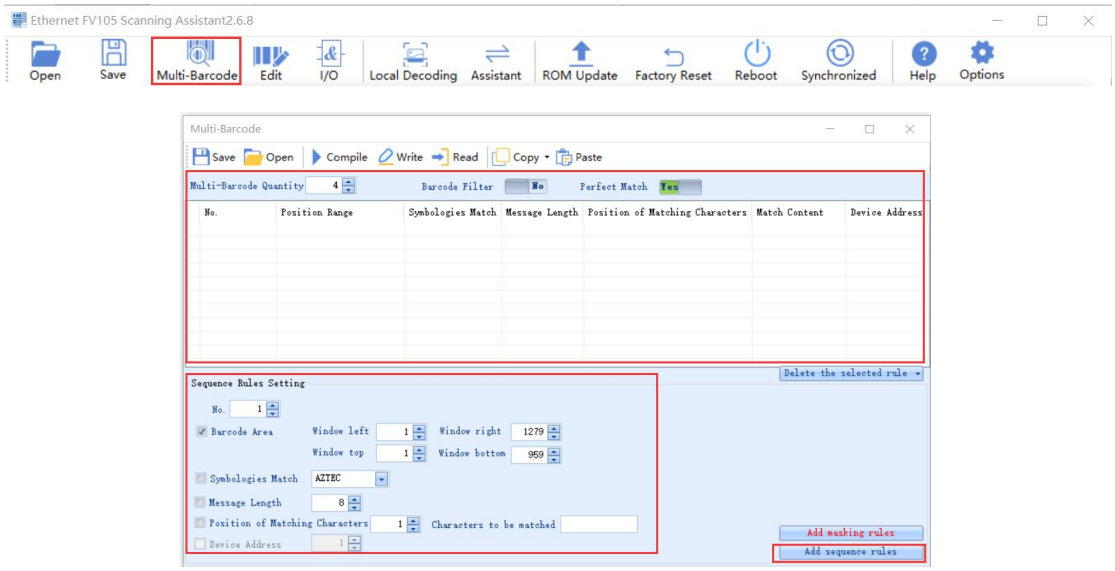


3.For example, set “Intermessage characters” to 2C (comma in hexadecimal), and “End characters” to 3B (semicolon in hexadecimal);



The data output after successful reading are shown as below:

4.Click "Multi-Barcode" of the standard toolbar, a dialog box pops up, where you can set multi-barcode rules.



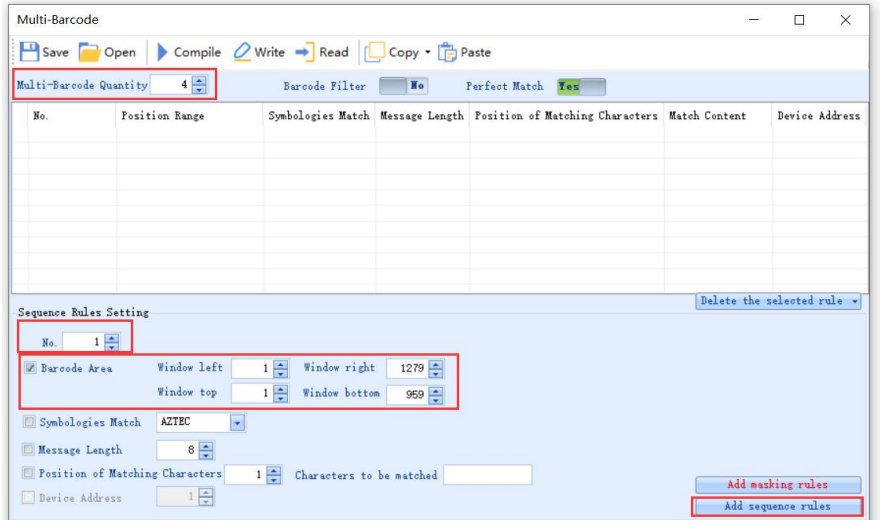
“Multi-Barcode Quantity” : The number of barcodes can be set according to needs;

If the quantity is set to “0” : The barcodes identified by the reader will all be

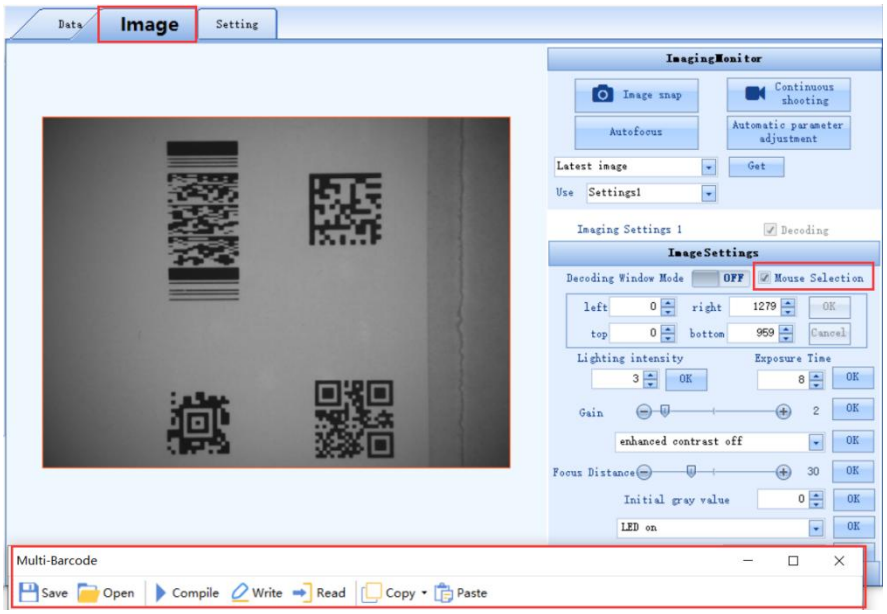
decoded and output;
If the quantity is set to "non-0" : The quantity of decoding information is same as the set quantity. For example, if the quantity is set to 3, then it outputs 3 barcode information.

7.2 How to set up selection, positioning and sorting of multiple barcodes

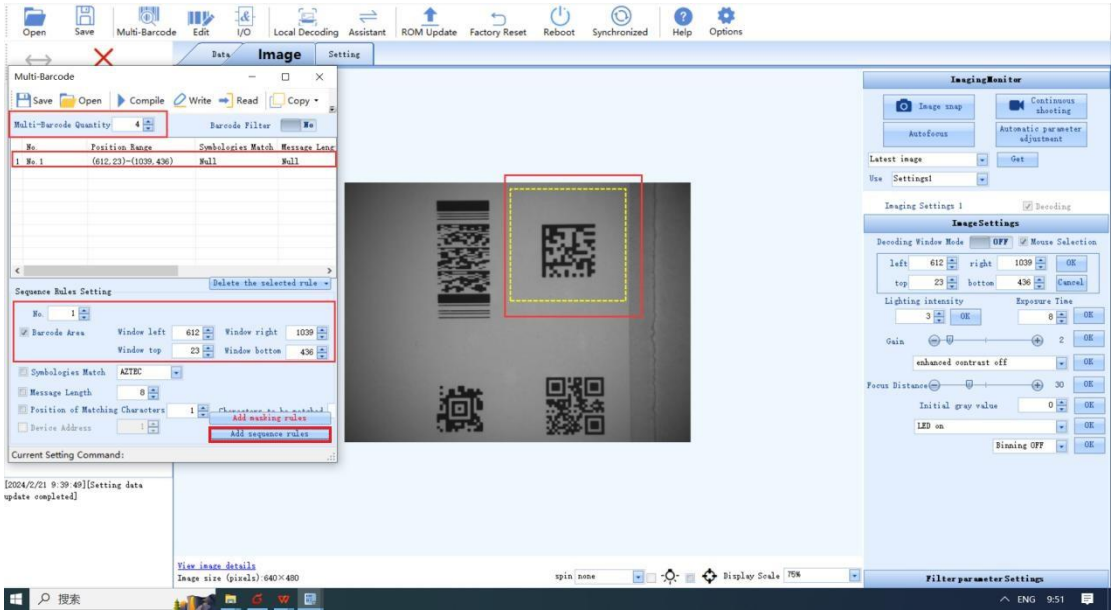
1.Open "Multi-Barcode", set the barcodes output sequence as needed;



2.Pull the "Multi-Barcode" window aside, select "Mouse Selection" in "Image Settings";



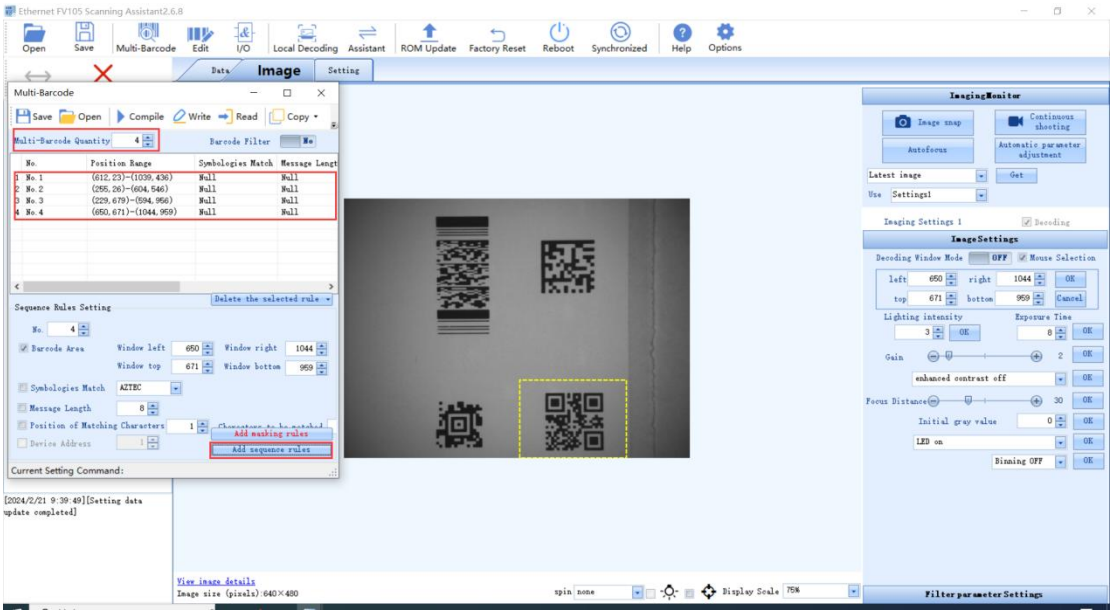
3.After selecting an area by mouse, the information of the selected barcode area will be automatically updated to the corresponding setting items in "Multi-Barcode", click "Add sequence rules", as shown in the figure:



If you need to set a second barcode, set the output sequence to “No.2” and select a new barcode area;

Likewise, set the third and fourth barcode. “Multi-Barcode Quantity” must match the number of barcodes in the output sequence.

After completing the above settings, click “Compile” and “Write” . Then the barcodes have been output according to sorting rules through barcode area selection.



4.Sorting can also be set by the following rules:

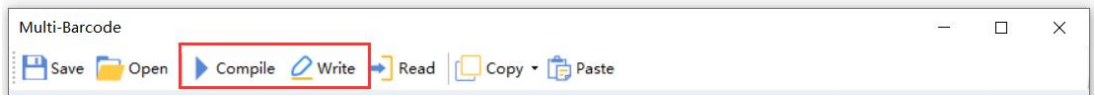
Code symbology matching: You can select the code symbologies needed in “Symbologies Match” (one of the barcode rules);

Barcode length: You can select the length of the barcode in “Message Length” (one of the barcode rules);

Matching characters position: Select in “Position of Matching Characters” . For example, for barcode ABC23, if to find the position of “C” , then the “Position

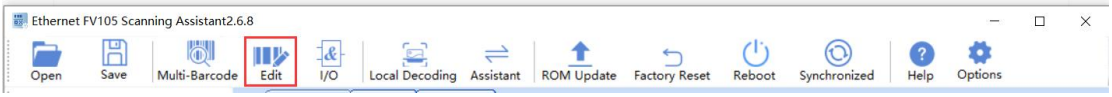
of Matching Characters" is "3".
Characters to be matched: Enter the characters in "Characters to be matched" as a bar code rule.

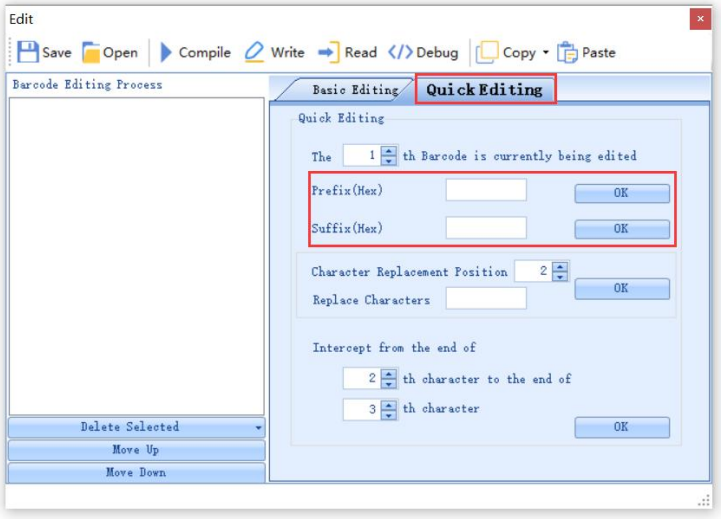
Note: The new rule needs to be added to the rules list. Click "Compile" and "Write", then the rule takes effect.



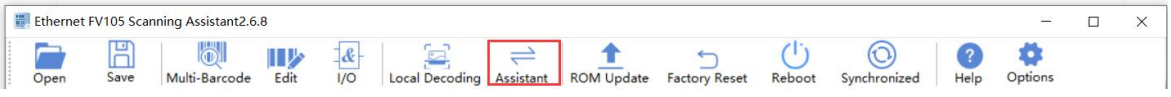
7.3 How to set the prefix or suffix of barcode content

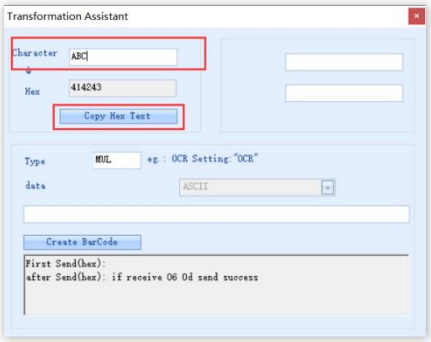
1.Open "Edit";



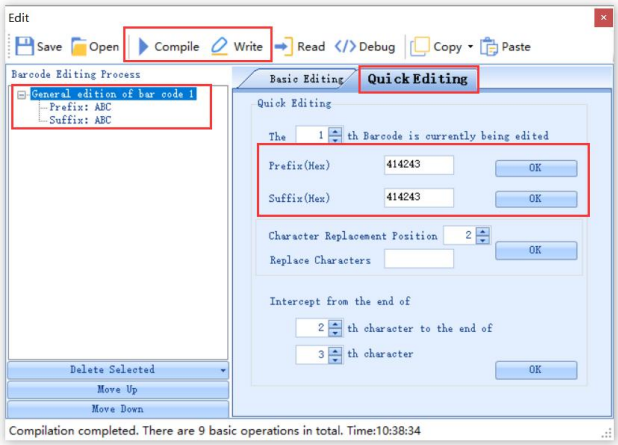


2.You can enter the desired characters in the text boxes after "Prefix (Hex)" and "Suffix (Hex)". The input text should be in hexadecimal which can be obtained in "Assistant" tool;
For example, if you need to add "ABC" characters before and after the barcode, click to open the "Transformation Assistant" dialog box, enter "ABC", it will be automatically converted to hexadecimal characters "414243", then click "Copy Hex Text";

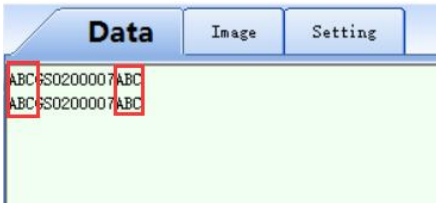




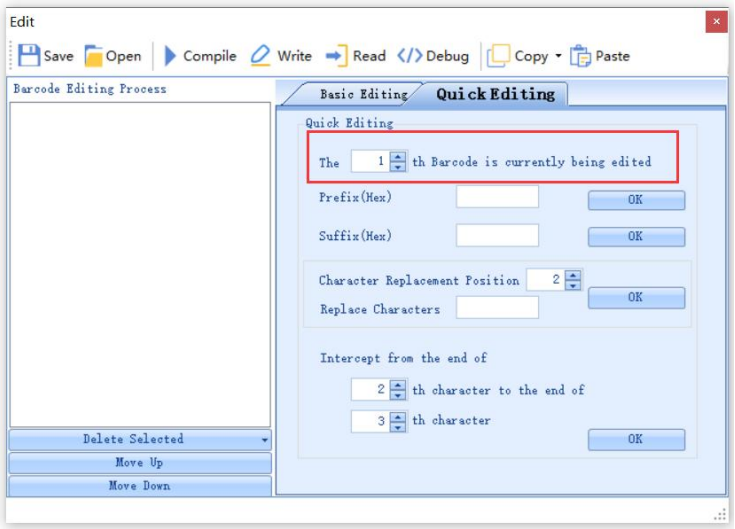
3.Paste the copied hexadecimal text into the corresponding Prefix and Suffix input box in “Quick Editing” . Then click “OK” , “Compile” and “Write” to complete the settings;



As shown in below picture, the prefix and suffix of the bar code information is "ABC".



4.In multi-barcode mode, it is also possible to add prefix and suffix to multiple different barcodes. Select the sequence number of the currently edited barcode on “Quick Editing” page.



7.4 How to set IO logic

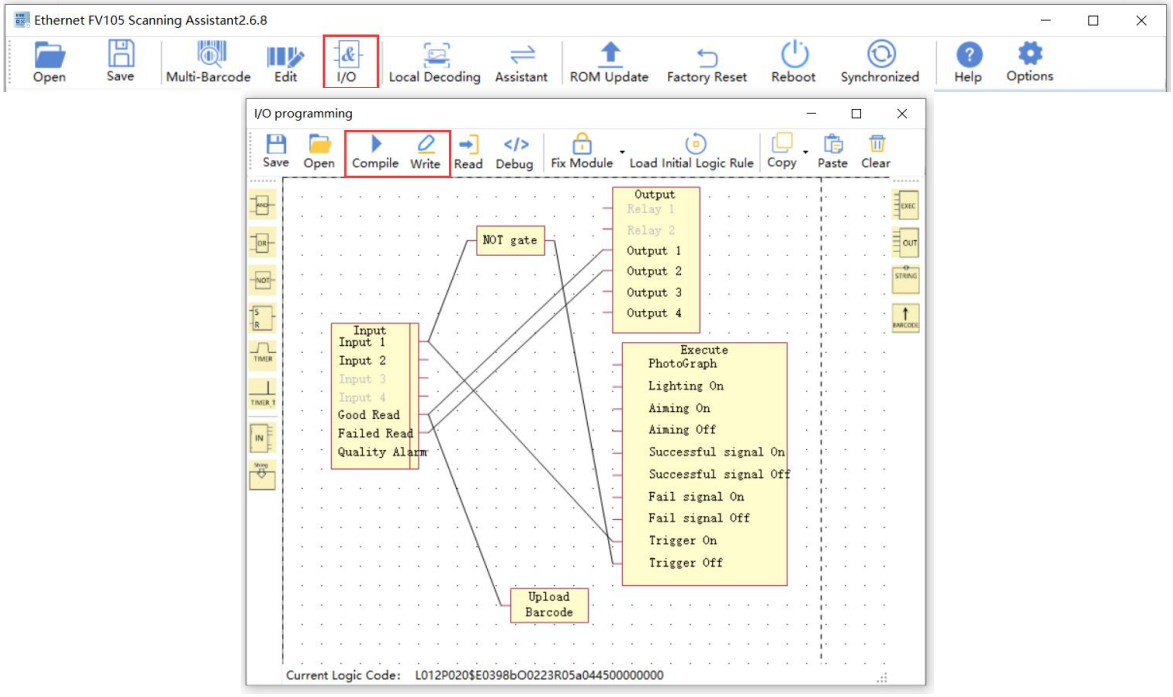
Open “I/O” from normal toolbar.

“Save” : Save the current I/O logic;

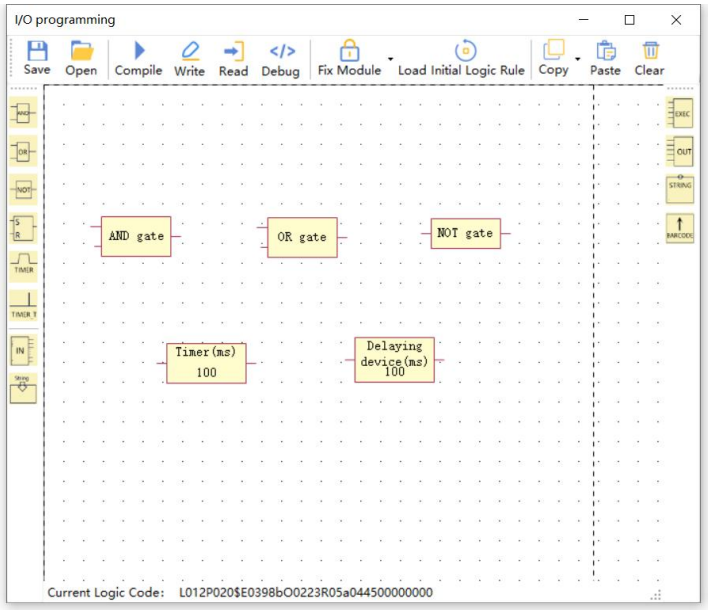
“Open” : Open the configured I/O logic;

“Load Initial Logic Rule” : Restore the I/O logic to the factory state;

“Compile” , “Write” : The modified I/O logic takes effect only after clicking Compile and Write.



Introduction to common functional modules:



The input and output states are represented by 1 and 0.

“AND” : When both inputs are 1, the output is 1 and the others are 0;

“OR” : When both inputs are 0, the output is 0 and the others are 1;

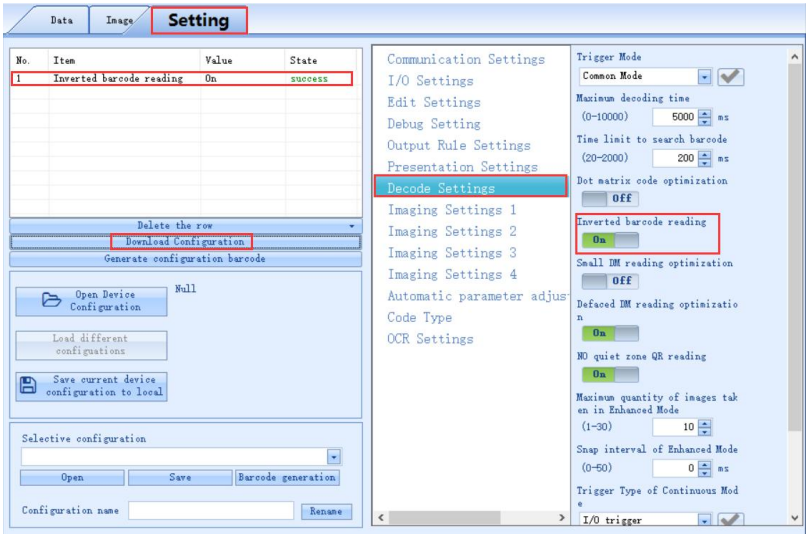
"NOT" : When the input is 1, the output is 0; When the input is 0, the output is 1;

"Timer" : During the process of doing something, there is a timer in the background. It will trigger another task when the scheduled time is up;

"Delaying device" : The duration of maintaining the current working state during the process of doing something.

7.5 How to set up inverted barcode applications

In "Setting" - "Decode Settings", enable "Inverted barcode reading", then click "Download Configuration".

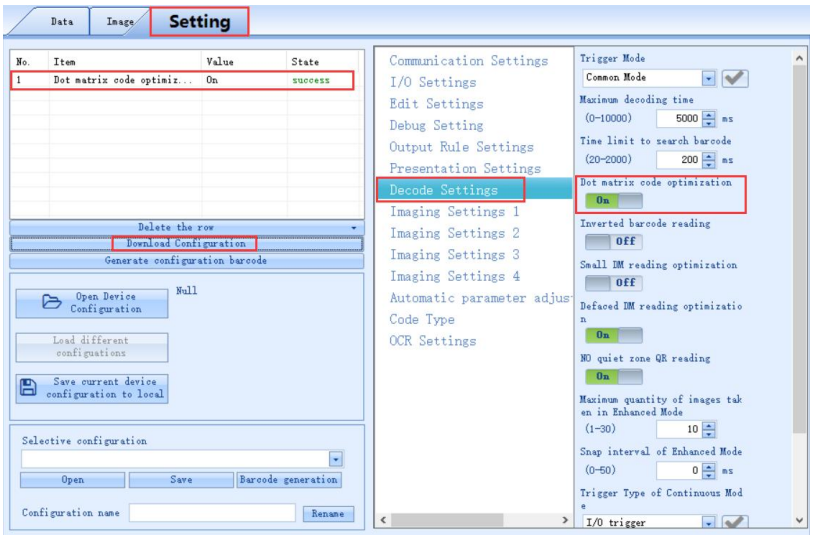


"Inverted barcode reading" disabled

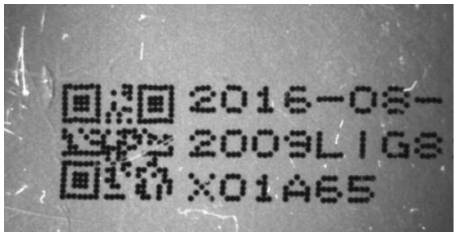
"Inverted barcode reading" enabled

7.6 How to set up Dot Matrix barcode applications

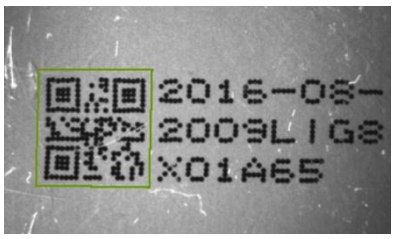
In “Setting” - “Decode Settings”, open “Dot matrix code optimization”, then click “Download Configuration”.



“Dot matrix code optimization” disabled



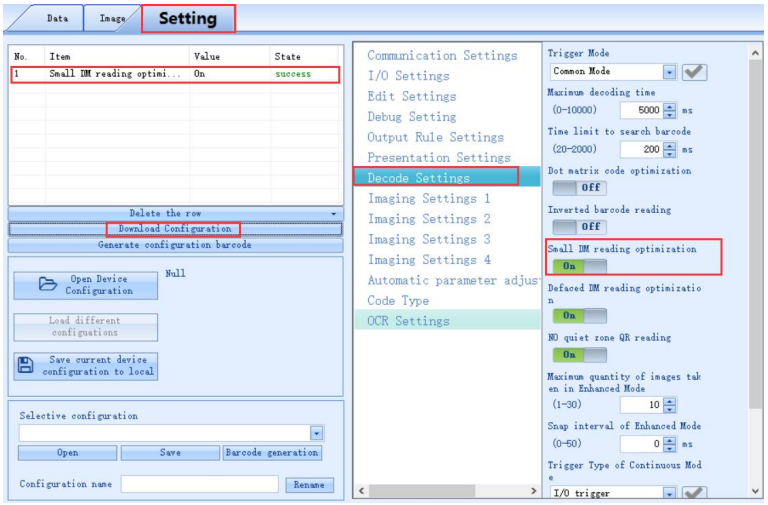
“Dot matrix code optimization” enabled



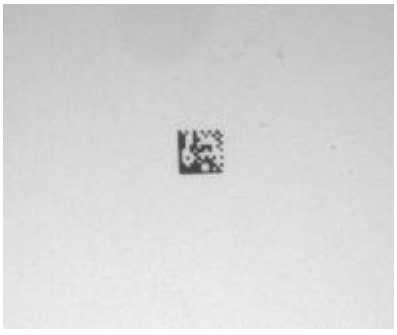
7.7 How to set up the application of small DM barcode and defaced DM barcode

Small DM barcode optimization reading:

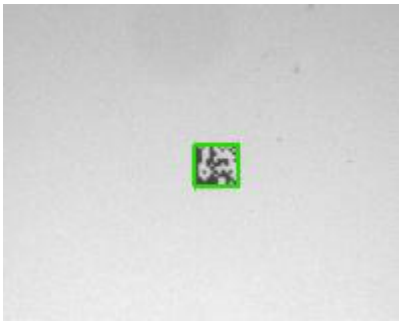
Open “Setting” - “Decode Settings”, open “Small DM reading optimization”, then click “Download Configuration”.



“Small DM reading optimization” disabled

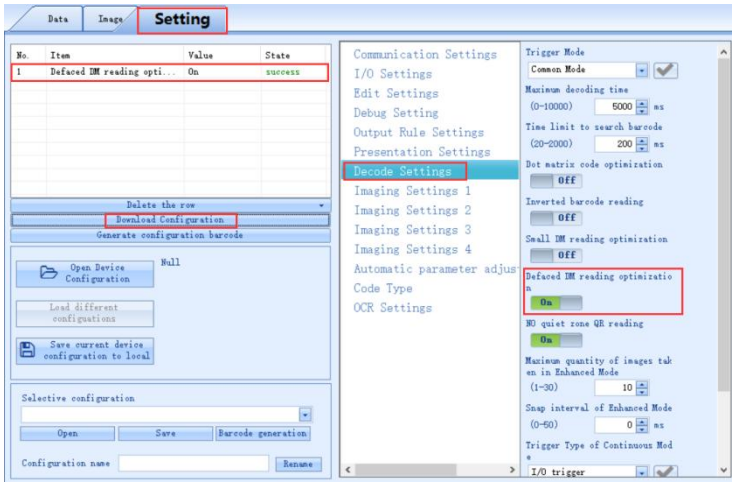


“Small DM reading optimization” enabled

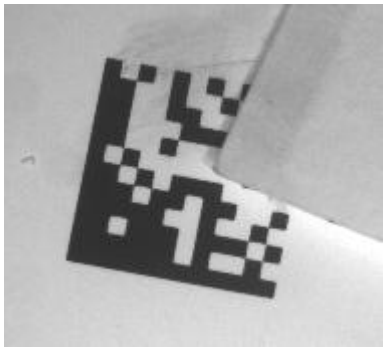


Defaced DM barcode optimization reading:

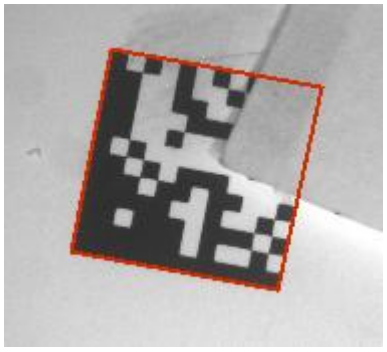
Open “Setting” - “Decode Settings”, open “Defaced DM reading optimization”, then click “Download Configuration”.



“Defaced DM reading optimization” disabled



“Defaced DM reading optimization” enabled

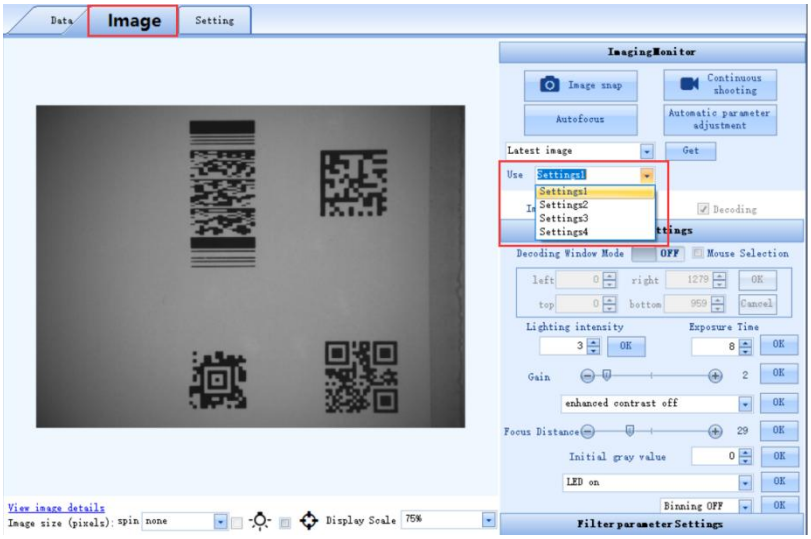


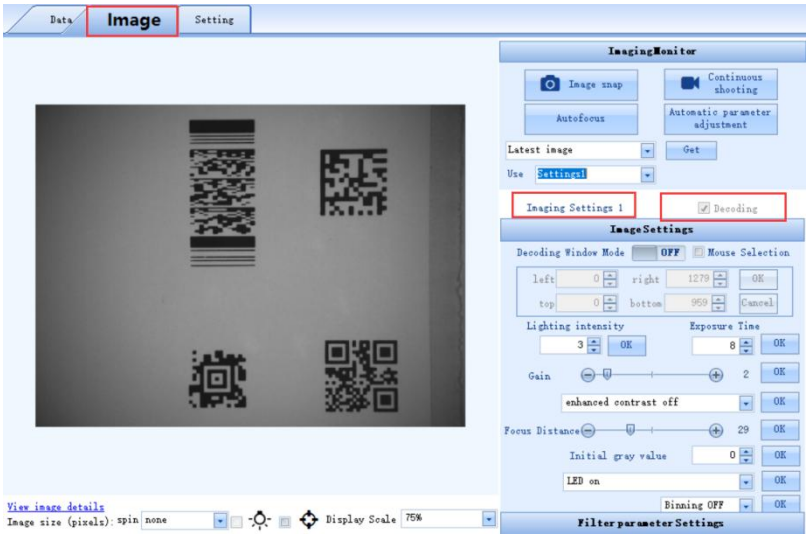
7.8 Set the application of polling reading

The polling reading application is mainly applied to the same batch, and in different situations such as code symbologies, coding medium, barcode quality, position, etc., different setting parameters need to be used to poll and decode; It can be set through the Image and Setting interface.

Image interface

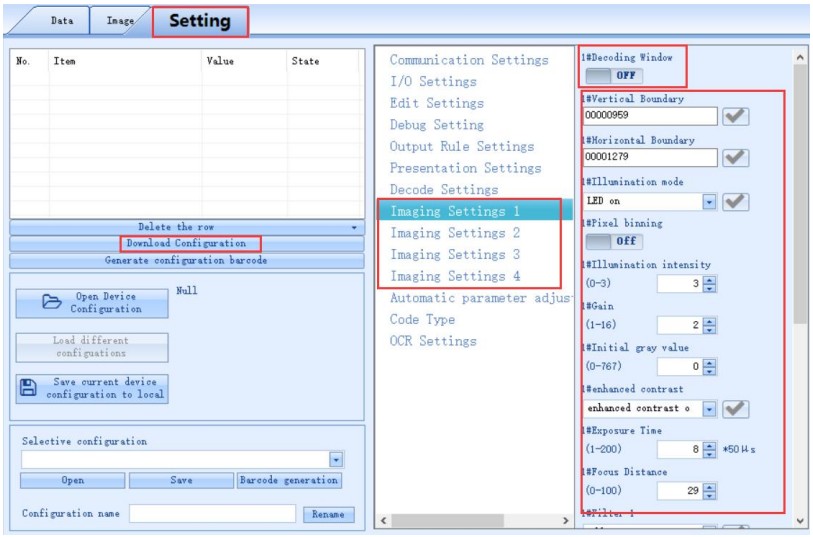
A total of 4 sets of parameter group (group1-group4) are available for polling and decoding. The default is parameter group 1, and parameter group 2-4 can be selected. When setting each parameter group, it is necessary to confirm the corresponding imaging parameter group settings and tune the parameters to suit barcode reading. Each imaging parameter group can be set separately. After the setting is completed, if the current parameter group is required to participate in polling decoding, it is necessary to tick the checkbox of "Decoding", then the polling decoding setting is completed.





Settings interface

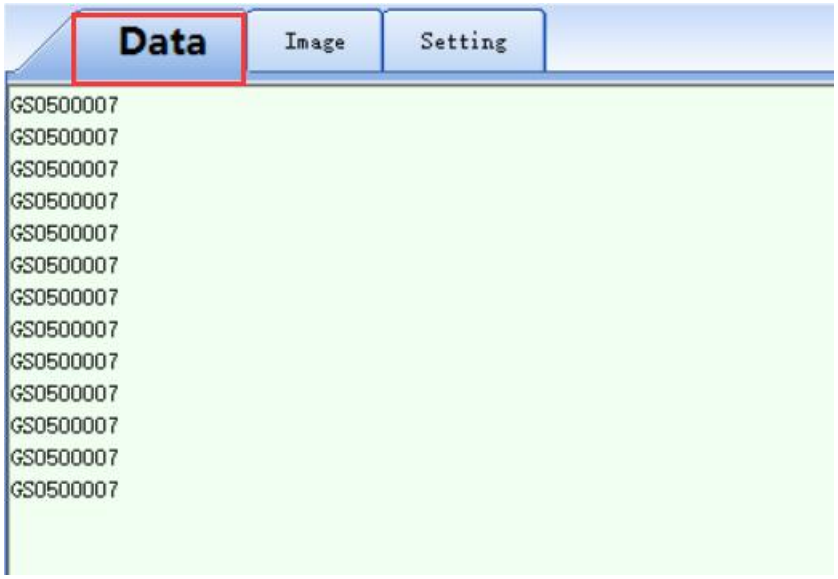
Set the needed parameters in the corresponding imaging parameter group, and tune the parameters to suit barcode reading. After setting, if the parameter group is required to participate in decoding, open "Decoding Window" to “ON” and click “Download Configuration”.



8 Other Operations

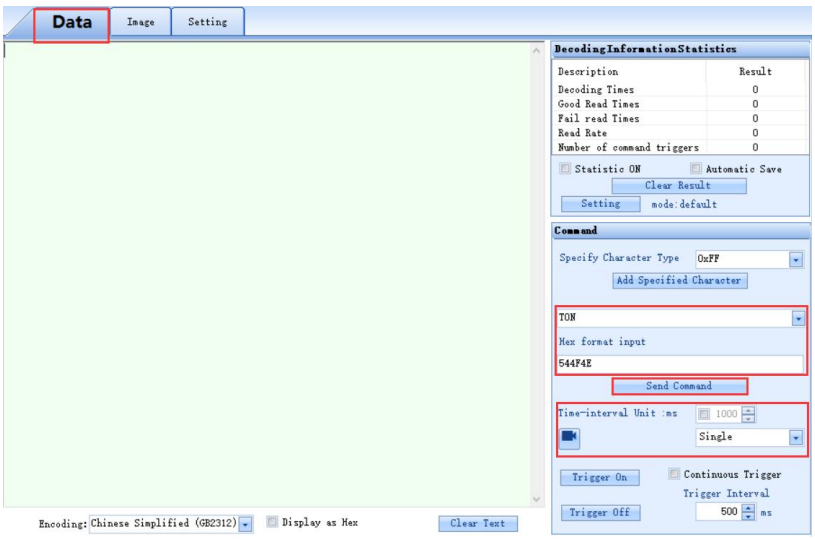
8.1 How to check the decoding data after successful setup

When device triggers, if the decoding is successful, the barcode information will be displayed in “Data” interface. As shown in below figure:



8.2 How to trigger devices through commands

In “Data” interface, select the corresponding command and click “Send Command” to trigger the device. The default trigger command for the device is "TON", and the trigger cancel command is "TOFF". To set command triggering interval, you can check in "Time-interval", the default is 1000ms/time.

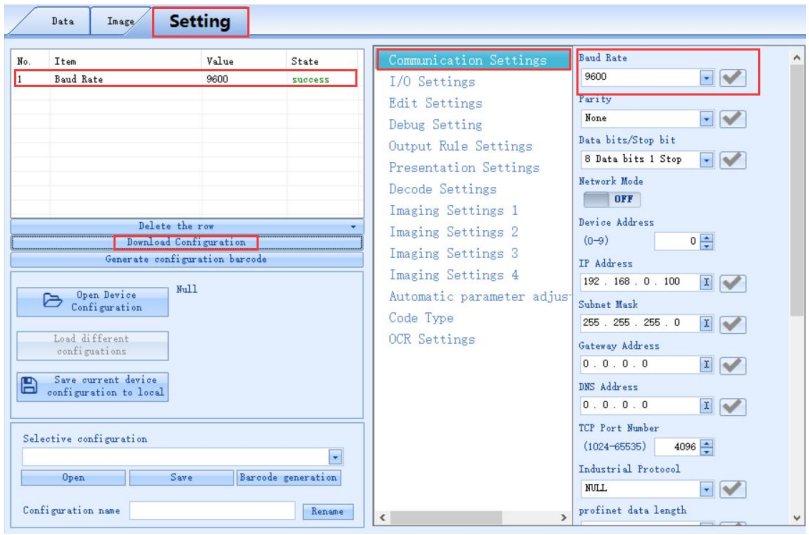


If you need to replace trigger command or trigger cancel command, you can make changes in “Setting” - “Edit Settings”, referring to the details in Chapter 6.9.

8.3 How to realize data input from the keyboard

Connect the QHQ cable DB9 (male) end to the Serial communication cable DB9 (female), and connect the USB end to the PC end.

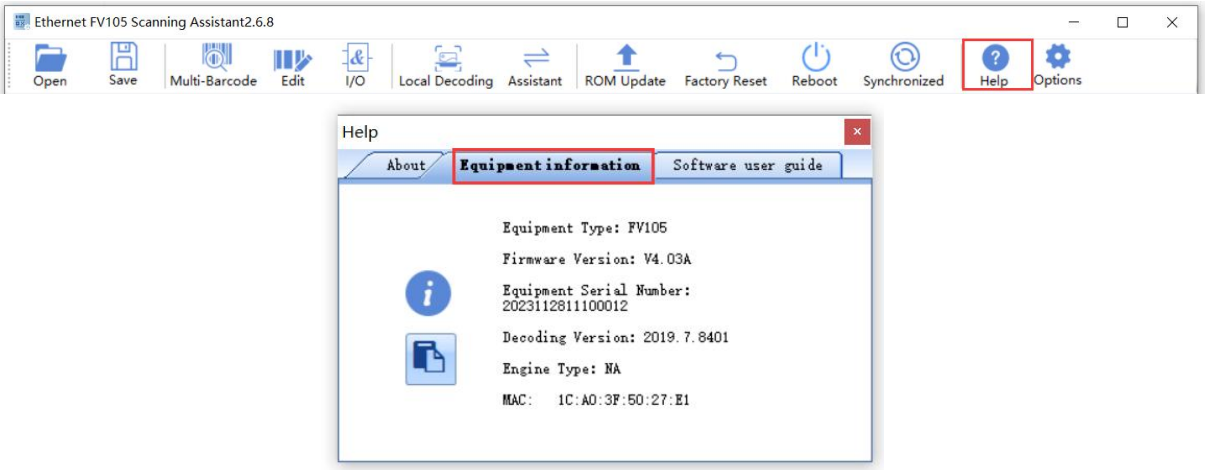
In “Communication Settings”, set the “Baud Rate” to 9600, other Serial port settings are factory default parameters. Click “Download Configuration”, then the output data is the data input from the keyboard. The data can be checked in a text file (in English mode).



Note: The QHQ cable is an optional accessory. If it's needed, please ask our sales or technical personnel to purchase.

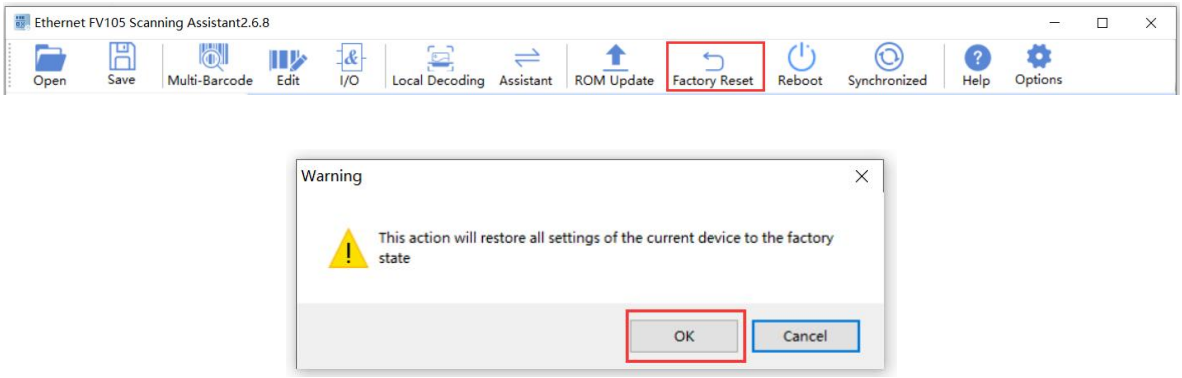
8.4 How to check the firmware version information of the reader

Click “Help” button and click on “Equipment information” to check the current device model, firmware version, etc. As shown in the figure:

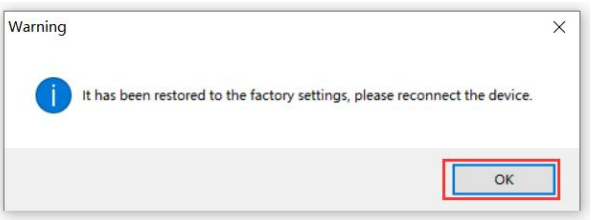


8.5 How to restore the factory settings for the reader

Click “Factory Reset”, the “Warning” dialog box pops up, then click "OK".

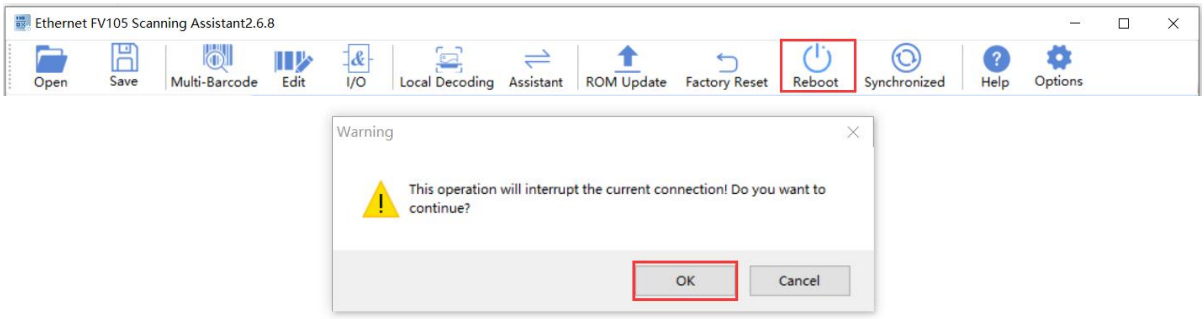


When you hear the device prompt sound and a "Warning" dialog box pops up, click "OK", then the device has been successfully restored to the factory.

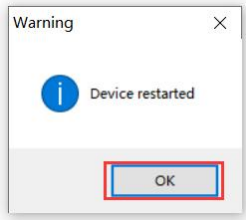


8.6 How to use “infostepper” to restart the barcode reader

1.Click "Reboot" button and a "Warning" dialog box pops up, then click "OK". As shown in the figure:

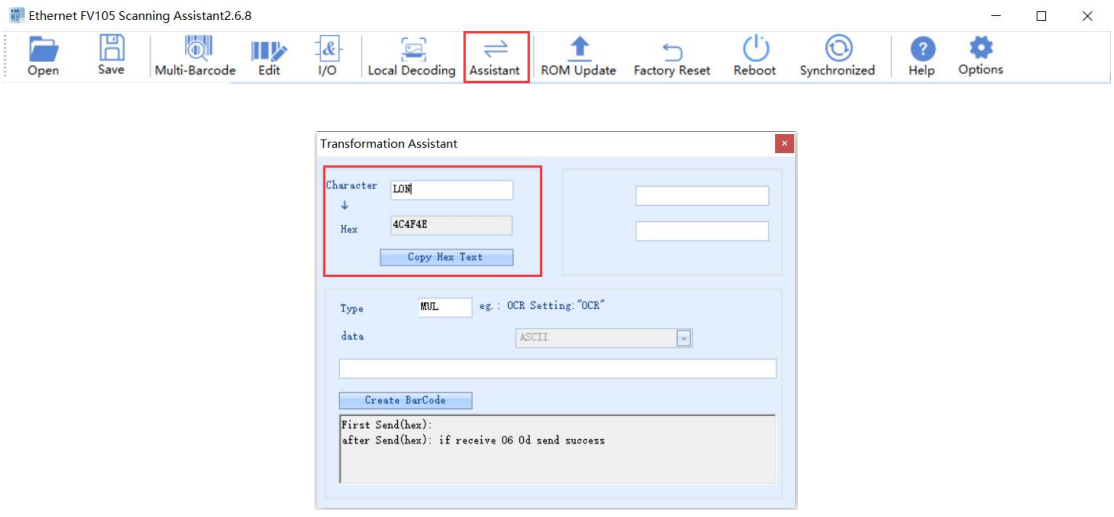


2.A "Warning" dialog box pops up, as shown in below figure. Click "OK" to complete the restart of the barcode reader. The buzzer prompts when the reader restarts. The “infostepper” has been restored to its initial state, you can connect it again.



8.7 How to convert characters to “Hex” (hexadecimal)

Click on “Assistant”, enter the characters needed, they will be automatically converted to hexadecimal characters. Click “Copy Hex Text” and paste it to the corresponding location you need.



9 Factory Settings

9.1 Factory settings description

Factory Settings Description	
Serial communication method	Baud rate：115200；Parity bit：NA Data bits：8；Stop bit：1
TCP Port number	4096
USB communication mode	Simulated Serial port
Default IP address	192.168.0.100
Default subnet mask	255.255.255.0
Default 24V/5V internal pull-up	Closed
Default trigger command	TON (544F4E)
Default trigger cancel command	TOFF (544F4646)
Default character feedback for reading failure	Closed (NR,4E52)
Default transmission delay	0s
Decoding time; Code symbologies information; Barcode position	Closed
Default duplicate barcode shielding	Closed
Trigger mode	Normal mode
Default maximum decoding time/Time limit for barcode search	5000ms/200ms
Dot matrix barcode optimization/inverted barcode reading/DM small barcode optimization	Closed
Optimization reading for defaced DM code/QR code reading without quiet zone	Opened
Default enabled code symbologies	128 code,39 code,93 code,UPC/EAN code,CODABAR code,PDF417 code,AZTEC code,DM code,QR code
Lighting intensity/Exposure time/Gain	3/8/2

10 Programming Guidance (C# Code Example)

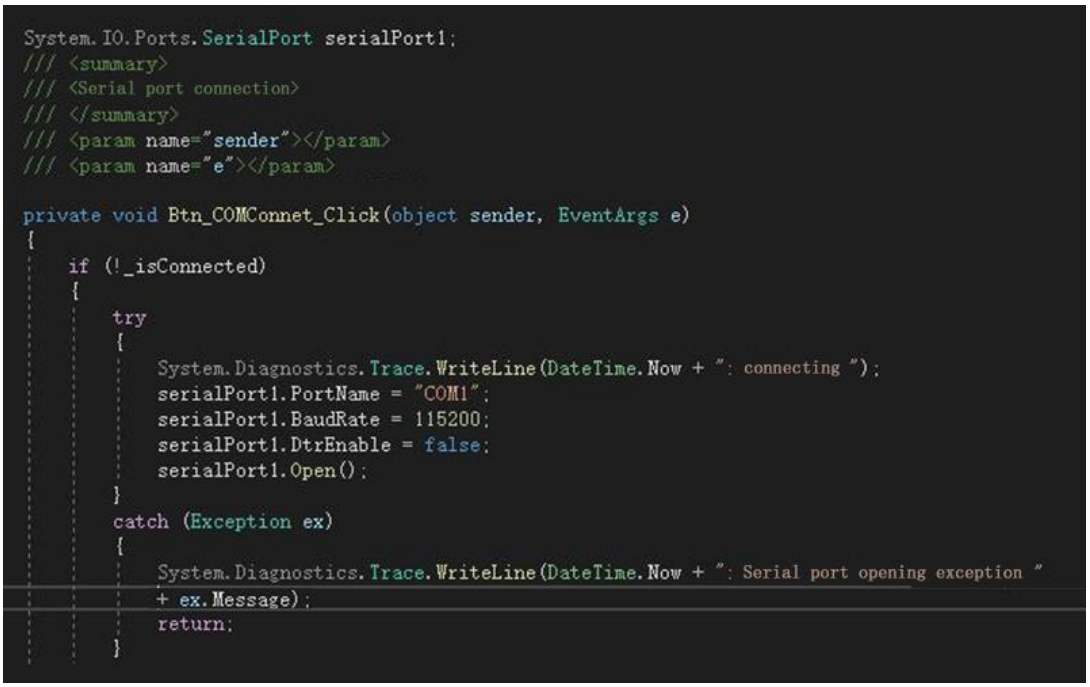
In order to reduce the threshold for code access, the transmission of device decoded data does not use private protocols. Familiar with using Serial/Network Assistant to control device triggering, it’ s able to quickly complete code writing after receiving device decoding data.
The example code here is in C# language. Other languages can refer to the relevant data transceiving code of the Serial/Network Assistant for writing, after becoming familiar with device operation.

10.1 Serial Port

1.Open Serial port
For parameters such as port number and baud rate, you can refer to the connection parameters of the host computer or Serial/Network Assistant.

```
System.IO.Ports.SerialPort serialPort1;
serialPort1.PortName = "COM1";
serialPort1.BaudRate = 115200;
serialPort1.DtrEnable = false;
serialPort1.Open();
```

For actual development, the error handling can be added as needed, as shown in the following figure:



```
System.IO.Ports.SerialPort serialPort1;
/// <summary>
/// <Serial port connection>
/// </summary>
/// <param name="sender"></param>
/// <param name="e"></param>

private void Btn_COMConnet_Click(object sender, EventArgs e)
{
    if (!_isConnected)
    {
        try
        {
            System.Diagnostics.Trace.WriteLine(DateTime.Now + ": connecting ");
            serialPort1.PortName = "COM1";
            serialPort1.BaudRate = 115200;
            serialPort1.DtrEnable = false;
            serialPort1.Open();
        }
        catch (Exception ex)
        {
            System.Diagnostics.Trace.WriteLine(DateTime.Now + ": Serial port opening exception "
            + ex.Message);
            return;
        }
```

2.Send trigger command
Trigger command defaults to “TON”;
To send a trigger command：serialPort1.Write("TON");
Support custom trigger commands, setting method can be found in chapter 6.9;
In addition to command triggering, other triggering methods are also supported, as shown in chapter 2.4.2~2.4.4.

3.Receive barcode data
Add the method of barcode data receiving
serialPort1.DataReceived += serialPort1_DataReceived;
Barcode data can be received in serialPort1_DataReceived
byte[] buffer = new byte[serialPort1.BytesToRead];
int len=serialPort1.Read(buffer, 0, buffer.Length);
Console.WriteLine(Encoding.ASCII.GetString(buffer, 0, len));

The default is to upload the barcode data as is, and a carriage return and line feed will be added at the end of a barcode for distinguishing. If necessary, you can refer to chapter 7.3 to modify the prefix/suffix of the barcode data, as it is convenient for the program to determine the integrity of the received barcode. It also supports setting the data uploaded after reading failure, which can be used to determine whether the decoding is successful or not, as shown in chapter 6.10.

```
private void serialPort1_DataReceived(object sender, System.IO.Ports.SerialDataReceivedEventArgs e)
{


    byte[] buffer = new byte[serialPort1.BytesToRead];
    int len=serialPort1.Read(buffer, 0, buffer.Length);
    //The obtained data defaults to the original barcode data, the encoding method can be selected
    according to the barcode content
    //Generally, English codes are encoded in ASCII, while Chinese codes are encoded in UTF8
    Console.WriteLine(Encoding.ASCII.GetString(buffer, 0, len));
```

10.2 TCP communication through network port

1.Establish a TCP connection

The IP address and port number settings of the device can refer to chapter 6.5.

private Socket _mySocket;

_mySocket = new Socket(AddressFamily.InterNetwork, SocketType.Stream, ProtocolType.Tcp); _mySocket.Connect(IPAddress.Parse("192.168.0.100"), 4096);

```
private Socket _mySocket;
/// <summary>
/// Ethernet connection
/// </summary>
/// <param name="sender"></param>
/// <param name="e"></param>

private void Btn_NetConnect_Click(object sender, EventArgs e)
{
    if (!_isConnected)
    {
        _mySocket = new Socket(AddressFamily.InterNetwork, SocketType.Stream, ProtocolType.Tcp);
        try
        {
            System.Diagnostics.Trace.WriteLine(DateTime.Now + ":connecting");
            _mySocket.Connect(IPAddress.Parse("192.168.0.100"), 4096);
        }
        catch (Exception ex)
        {
            System.Diagnostics.Trace.WriteLine(string.Format("{0}:TCP connection exception {1}", DateTime.Now,
            ex.Message)); return;
        }
```

2.Send trigger command

Trigger command defaults to “TON”;

To send trigger command:

_mySocket.Send(Encoding.ASCII.GetBytes("TON"));

Support custom trigger commands, setting method can be found in chapter 6.9;

In addition to command triggering, other triggering methods are also supported, as shown in chapter 2.4.2~2.4.4.

3.Data reception

There are many ways for Socket to receive data, you can choose one of them according to the actual application scenario. Here below is one of the methods, for more methods, please refer to the official guide.

Create a new thread

Thread TRec = new Thread(RecvMsg) { IsBackground = true };

TRec.Start();

Open a loop in the thread to continuously check if there is any data that needs to be read

if(_mySocket.Available<=0)

```
{
Continue;
}
If there is, read the data and process it
byte[] buffer = new byte[_mySocket.Available];
int length = _mySocket.Receive(buffer);
Console.WriteLine(Encoding.ASCII.GetString(buffer, 0, length));
```

The device supports setting the data uploaded after reading failure, which is used to determine whether the decoding is successful or not, as shown in chapter 6.10.