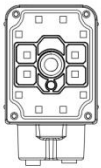
Quick Reference Guide

FV10X(V2.0)Series
Industrial Barcode Scanner



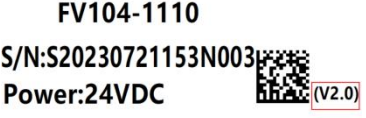
Ver: 20230926

Applicable Model Declaration

This reference guide is only for use of FV10X series v2.0 devices.

If mismatched guide book is used, it may result in the inability to use the device properly or damage to the device. We are unable to provide warranty service to damaged devices caused by this reason.

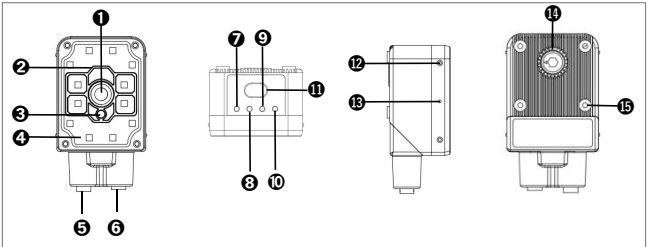
Please check the marked position on the device label as below picture to find the device version information.



Packing List

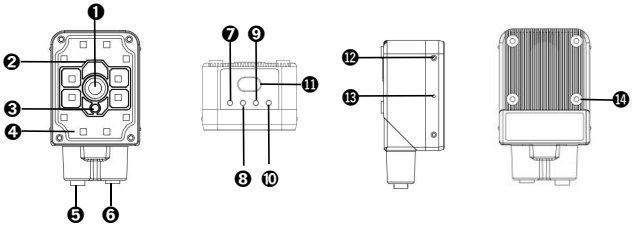
Content	Unit	QTY	Remark
FV10X（V2.0）Host	pc	1	
Fixed installation screws	pc	4	Material: nylon
Fixed installation insulating gasket	pc	1	Material: acrylic
L-shaped metal fixing piece	pc	1	Material: stainless steel
Quick Reference Guide	pc	1	This guide is only applicable to Version 2.0
Focus adjustment wrench	pc	1	For manual-focusing model FV104

Product Overview -1 (The following drawing is FV104)



1	Lens
2	Lens Cover
3	Laser Aimer
4	Array LED Illumination
5	8 PIN Circular Connector (Ethernet communication)
6	12 PIN Circular Connector（Serial communication, Power supply, I/O）
7	PWR（Power indicator - red）
8	GOOD（Reading success indicator - blue）
9	FAIL (Reading Failure indicator - red）
10	TRAIN（One-click automatic parameter adjustment indicator）
11	Trigger Button
12	Illumination Kit Buckle
13	Fixing Hole For Illumination Kit
14	Focusing Adjustment Knob
15	M5 Mounting Hole

Product Overview -2 (Drawing below is FV105)



1	Lens
2	Lens Cover
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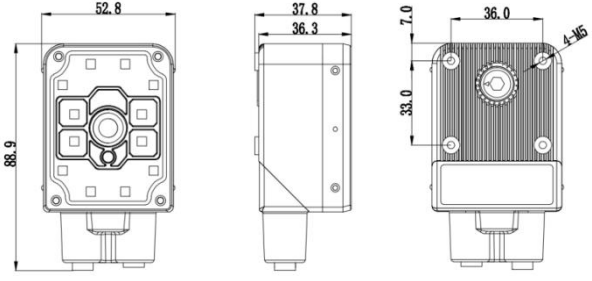
5	8 PIN Circular Connector (Ethernet communication)
6	12 PIN Circular Connector（Serial communication, Power supply, I/O）
7	PWR (Power indicator - red)
8	GOOD（Successful reading indicator - blue）
9	FAIL（Failed reading indicator - red）
10	TRAIN（One-click automatic parameter adjustment indication）
11	Trigger Button
12	Illumination Kit Buckle
13	Fixing Hole For Illumination Kit
14	M5 Mounting Hole

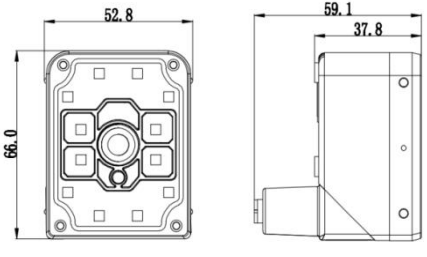
Product Dimensions -1

(unit：mm)

General status

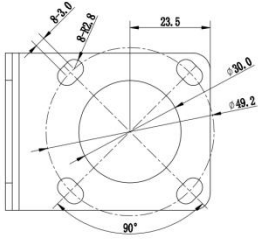


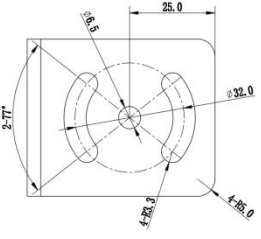
Body rotation 90 degrees

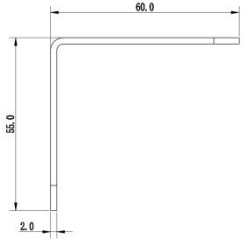


L-shaped Fixing Plate Sizes

(unit：mm)







Installation Inspection

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

1. No impact of ambient light;

Please avoid ambient light such as sunlight, other lighting, and photoelectric sensors entering the FV10X receiving area, otherwise it may cause unstable reading or reading errors.

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

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

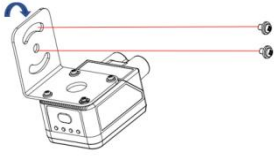
If there are other devices emitting strong light (direct and reflected light) on site, please set up a light shield to avoid such strong light from damaging the code reader or causing unsuccessful code reading.

Sketch Of Using Fixing And Insulating Sheets

Use the mounting bracket to obtain the most suitable reading position. The figure shows the most common installation method. The

installation position of the L-shaped metal fixing plate can be adjusted according to actual needs (the picture shown is FV104).

Angle Adjustment Sketch

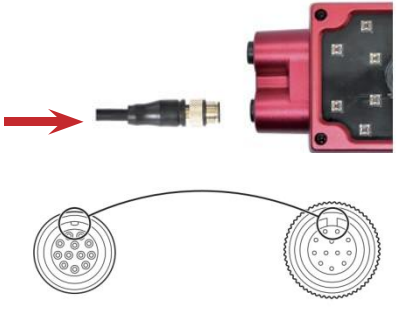


As shown in the figure, adjust the angle of the device to an appropriate angle position and screw the L-shaped fixing plate firmly.

Connection And Wiring Diagram

Serial communication cable connection

a. Connection between Host and Serial communication cable



The arrow in the figure refers to the connection position of the Serial cable. Align the concave position of the cable connector with the corresponding concave position of the 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. Connecting the power supply

The arrow in the figure indicates the connection position of the power supply on the serial cable

Ethernet communication cable connection

Connection between Host and Ethernet communication cable

The arrow in the figure indicates the Ethernet communication cable connection location

Align the concave position of the cable connector with the corresponding port of the device; 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 communication cable must be connected to the device.

I/O Signal

1.Picture of signal terminal appearance

The I/O terminal is located on the serial cable. If the device is connected to external signals or drives external devices, this terminal needs to be used for connection with external devices.

2. Explanation of signal terminal definition

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	
Grey	IN1	Input signal 1	Start reading
Dusty pink	IN2	Input signal 2	
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 Optional internal pull-up, effective level selectable (Note ②)
White green	OUT2	Transistor output 2	Read failure Optional internal pull-up, effective level selectable (Note ②)
White	OUT3	Transistor output 3	Optional internal pull-up, effective level selectable (Note ②)
Brown	OUT4	Transistor output 4	Optional internal pull-up, effective level selectable (Note ②)
Black	PG	Frame grounding	

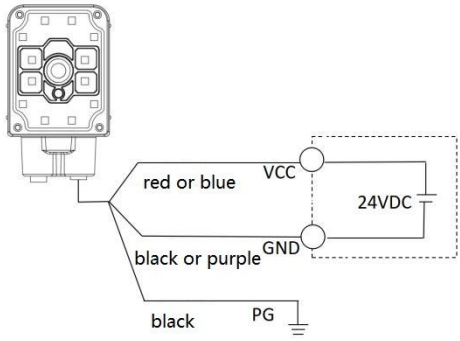
Note ①: It depends on the voltage of the power adapter connected to the Serial cable

Note ②: The effective level value can be set and defaults to 24VDC

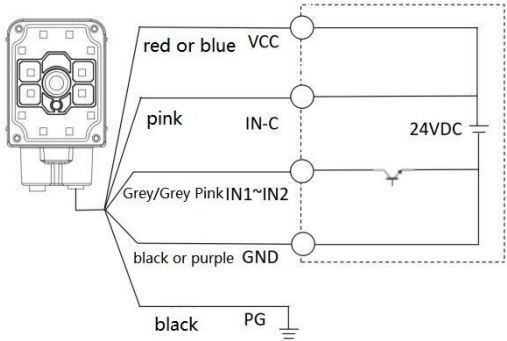
Please strictly follow the instructions when using I/O terminals. If external device is not connected according to the usage specifications or if the connection exceeds the specified load, it may cause damage to the product itself and cannot enjoy warranty and repair services.

3. Wiring according to purpose

3.1 Using I/O terminals for power supply and wiring



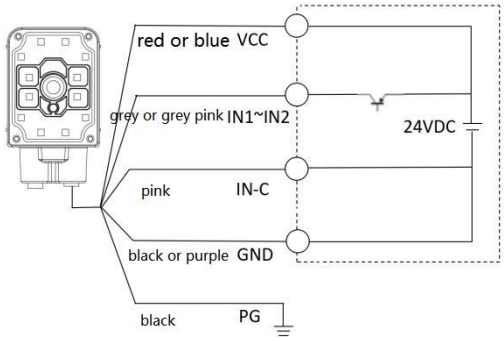
3.2 NPN Photoelectric sensor trigger wiring



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 corresponding wire sequence is shown as below table:

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

3.3 PNP Photoelectric sensor triggering wiring

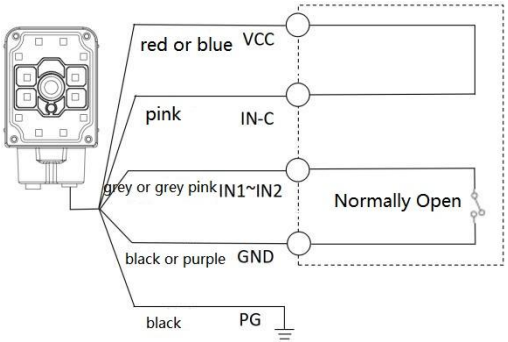


Select the PNP type, connect the IN-C terminal to GND firstly, then connect the photoelectric sensor to the relevant scattered wire terminals. The corresponding wire sequence is shown as below table:

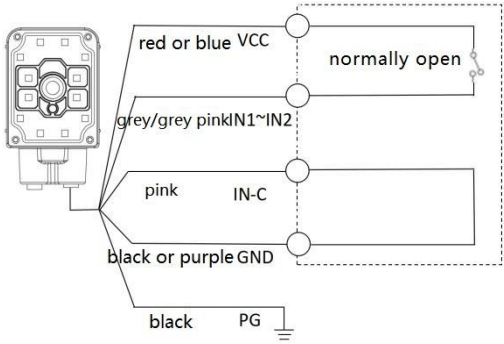
Photoelectric sensor	Signal terminal
Brown (+)	VCC
Blue (-)	GND
Black or other color (OUTPUT)	IN1

3.4 Switch and relay triggering wiring

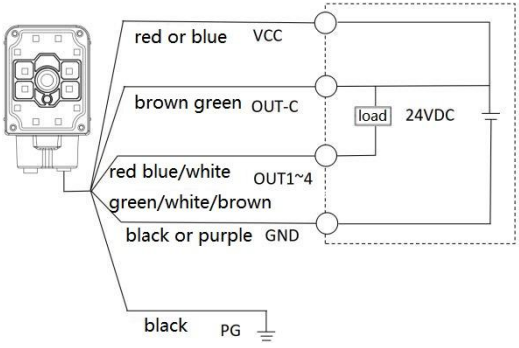
3.4.1 Method 1



3.4.2 Method 2



3.5 External load wiring



3.5.1 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 (taking NPN type alarm light as an example) is connected to the OUT-C terminal, the negative pole is connected to the OUT1 and OUT2 output terminals. When the reading is successful, the green light will light up, when reading fails, the red light will light up and the alarm will sound. The corresponding wire sequence is shown as following table:

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

3.5.2 Using 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, at the same time, 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 is closed. The corresponding wire sequence table is as follows:

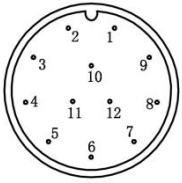
Relay	Signal terminal
Coil terminal 1	OUT-C
Coil terminal 2	OUT2

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

If external device is not connected according to usage specifications or if the connection exceeds the specified load, it may cause damage to the product itself and warranty services are not available.

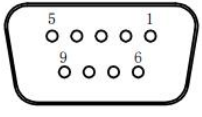
4. Definition of cable pins

4.1 12 PIN Definition of serial cable



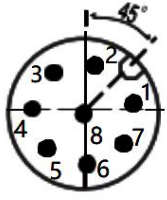
12pin circular connector (pin)	Core cable
1	VCC
2	GND
3	IN2
4	OUT3
5	OUT4
6	IN-C
7	OUT2
8	OUT1
9	IN1
10	OUT-C
11	RS232-TX
12	RS232-RX

4.2 DP9 Female end (hole)

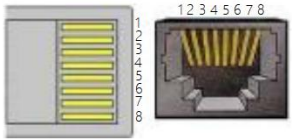


2	TX
3	RX
5	GND

4.3 8 PIN Ethernet cable definition



1	TX-
2	RX+
3	RX-
4	
5	
6	
7	TX+
8	



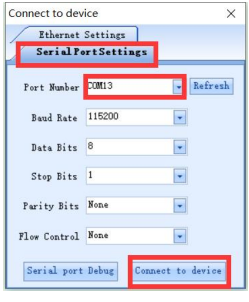
1	TX+
2	TX-
3	RX+
6	RX-

Setting Tool infostepper Configuring Settings (Recommended Settings)

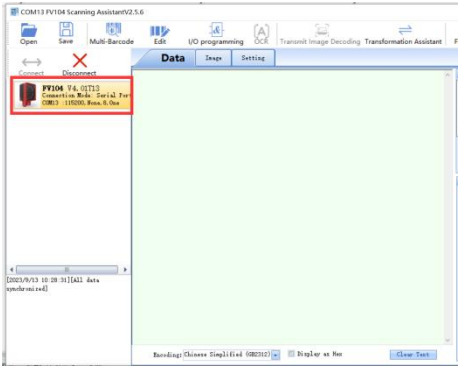
1. Connection interface

1.1 RS232 Serial port connection method

After the device is directly connected to the computer, firstly, check "Device Manager" -> "Port". When connecting to the software, click "Connect" 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 "Refresh" button to find.



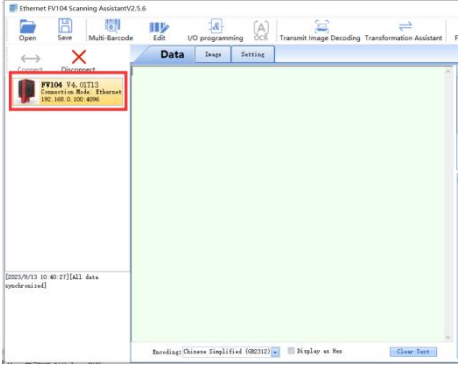
Click on "Connect to device" and the interface will be as follows after the Serial port connection is successful:



1.2 Ethernet connection method

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 computer and device's IP (default 192.168.0.100) are in the same network segment. When connecting to the software, click "Connect" to open the "Connect to device" window, select "Ethernet Settings" and automatically find the current device.

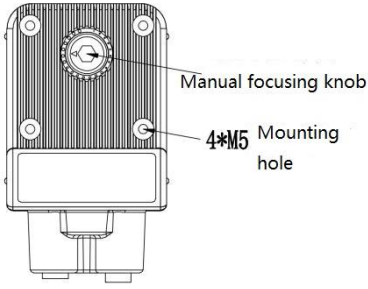
Click on "Connect to device" then, the Ethernet connection interface is as follows:



2. Image configuring

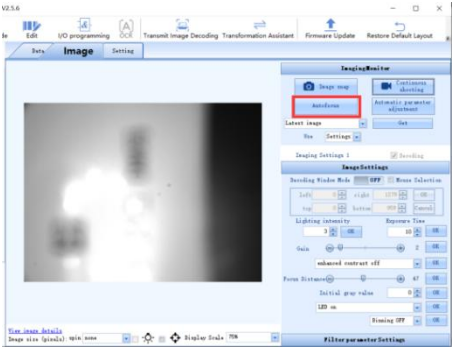
2.1 Focusing method

2.1.1 Manual focusing device focusing adjustment (FV104 series only)

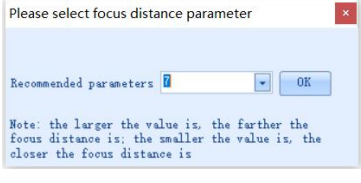


Use the focusing adjustment wrench provided in the packing list to rotate the focusing knob, observe the image and adjust the image to be clear (the dots around the knob correspond to relevant scales, dots from small to large correspond to the focusing distance from near to far)

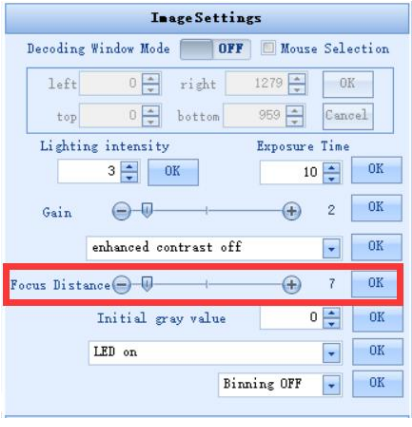
2.1.2 Autofocus device focus adjustment (FV105 series only)



The device is fixed at a certain height, click on "Autofocus" and the device will perform autofocus. If the autofocus is successful, the buzzer will prompt for success (there is a difference in the failure prompt) and automatically switch to continuous shooting for easy viewing of the focusing effect. If the effect is not ideal after successful focusing, you can select the value in the "Recommended Parameters" in the pop-up window and select the parameter value that can meet the relatively better focusing effect. Click OK to close the pop-up window. If the autofocus fails, the buzzer prompts for failure.



2.1.3 Manual setting of focusing parameters for autofocus devices (FV105 series only)



The device is fixed at a certain height, click on continuous shooting to view the real-time image in the image section. Adjust the "Focus Distance" data by clicking on "+" or "-" and view the image while adjusting. Continue adjusting until a clear image of the barcode with a green box appears.

2.2 Image parameter adjustment method

2.2.1 Automatic parameter adjustment

Firstly, ensure that there are readable barcode samples in the field of view;

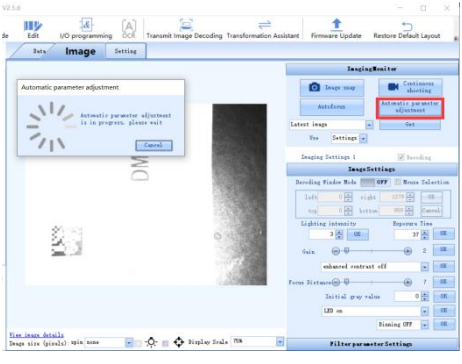
When automatic focusing is completed (focusing successfully), click on "Automatic parameter adjustment" to automatically adjust parameters, including exposure time, gain and lighting mode;

If the automatic parameter adjustment is successful, the buzzer will sound a successful prompt and automatically jump to continuous shooting, making it easy to check the parameter adjustment effect;

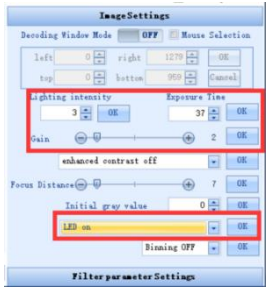
If automatic parameter adjustment fails, the buzzer will sound a failure prompt;

Before automatic parameter adjustment, the "Imaging Settings" can be adjusted as shown in the following figure to ensure efficient automatic parameter adjustment.

The "Automatic parameter adjustment" process interface is shown as the following figure:

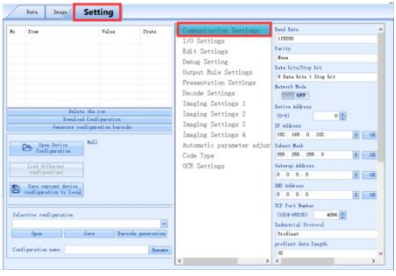


2.2.2 Manually setting image parameters



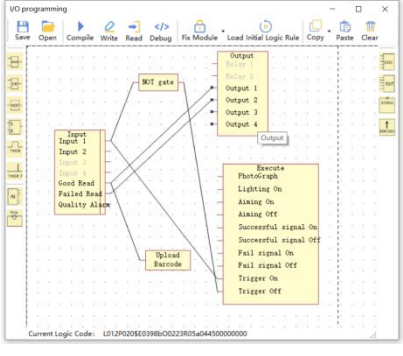
Fix the device at a certain height, click on continuous shooting, view the real-time image in the image section. Adjusting the data of "Lighting intensity", "Exposure Time" and "Gain", view the image while adjusting. Continuously adjust until the barcode image is clear and a green box appears.

3. Communication settings interface



You can modify and set the required communication related items on the Setting interface.

4. I/O Logic setting interface



You can modify and set the needed I/O logic through the "I/O programming" interface.

Technical parameter specifications

Model	FV104 series	FV105 series
Sensor	1/3 inch CMOS sensor, global shutter	
Image Resolution	1280×960	
Frame Rate	Up to 60 frame/s	
Lens Type	Manual Focusing	Liquid lens, auto-focus
Focal Length	FV104:7.5mm	FV105N:6mm FV105S:12mm FV105L:16mm
Angle of View	37° (horizontal), 28° (vertical)	FV105N: 45° (horizontal), 33.8° (vertical), FV105S: 22° (horizontal) 16.5° (vertical) FV105L: 15° (horizontal) 11.25° (vertical)
Roll/ Pitch/ Yaw	360° (roll) / 65° (pitch) / 65° (yaw)	
Trigger Mode	Command trigger; I/O trigger; Continuous reading mode; Key trigger, etc.	
LED Indicator	4pcs LED indicator lights (power, reading success, reading failure, automatic parameter adjustment)	
Illumination Source	12pcs LED lights / Can be controlled in groups / High-brightness light source / Polarized light source;	
Illumination Source Colour	Red / White LED light source available	
Front Cover of Illumination	Atomization Cover / Polarization Cover / Atomization+Polarization Cover (combined use with high-brightness light source)	
Aiming Mode	Laser cross aiming	
Laser Safety Level	Class2	
Communication InterfaceCommunication Interface	Ethernet, Serial port	
Communication Protocol	Ethernet: TCP/IP, FTP, Profinet, Modbus TCP, EtherNet/IP Serial port: RS232	
Power Supply	20 ~ 30 VDC	
Power Consumption	2.2W (Standby), 12W (Peak), 4W (Average)	
Operating Current	Standby: 110mA, Peak: 600mA, Average: 200mA	
Number of Input Signals	2	
Type of Input Signal	NPN or PNP	

Effective Voltage of Input Signal	NPN: ≤16V PNP: ≥5V (Max : 24V)	
Number of Output Signals	4	
Output Load Capacity	Single Maximum: 100mA@24VDC Total Maximum: 200mA@24VDC	
Shell Material	Aluminum alloy	
Weight	196.3g (excluding cables)	FV105N: 192.5g (excluding cables) FV105S: 195.4g (excluding cables) FV105L: 191.3g (excluding cables)
Dimensions (L×W×H)	88.9mm×52.8mm×37.8mm	
Operating Temperature	-25℃~ 60℃	
Storage Temperature	-40~70℃	
Relative Humidity	5% ~ 95% non-condensing	
Ambient Light Immunity	0~100,000Lux	
Vibration Resistance	10 ~ 55 Hz, double amplitude 0.75mm, 3 hours in x, y or z direction	
IP Rating	IP65	
ESD Protection	±10KV Indirect coupling surface, ±16KV Direct air discharge	
Explosion Proof Grade (specified model)	Exib IIA T4 Gb	
Certifications	CE, RoHS, etc.	
Readable Code Symbologies	1D, 2D and stacked codes that meet national and international standards	
Maximum Reading Accuracy	1D code: 1.6 mil 2D code: 2 mil	FV105N 1D code: 1.67 mil 2D code: 2.5 mil FV105S 1D code: 3.3 mil 2D code: 5 mil FV105L 1D code: 0.67 mil 2D code: 1mil

Technical parameter specifications

Reading characteristic data sheet

unit: mm

Barcode specifications	FV105S		FV105N		FV105L	
	Nearest	Farthest	Nearest	Farthest	Nearest	Farthest
3.34mil Code 128	50	228	50	108	50	337
5mil Code 128	50	342	50	162	50	505
6.67mil Code 128	50	456	50	216	50	674
10mil Code 128	50	684	50	324	50	1010
15mil Code 128	50	1026	50	487	50	1516
5mil DataMatrix	50	186	50	88	50	275
6.67mil DataMatrix	50	248	50	118	50	367
10mil DataMatrix	50	373	50	177	50	551
15mil DataMatrix	50	559	50	265	50	827

Barcode specifications	FV104	
	Nearest	Farthest
3.34mil Code 128	25	285
5mil Code 128	20	425
6.67mil Code 128	20	570
10mil Code 128	25	700
15mil Code 128	40	905
5mil DataMatrix	25	105
6.67mil DataMatrix	25	155
10mil DataMatrix	25	260
15mil DataMatrix	25	395

Visual Field

Reading distance	FV105S		FV105N		FV105L	
	X-axis field of view	Y-axis field of view	X-axis field of view	X-axis field of view	X-axis field of view	X-axis field of view
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 field of view	**Y-axis field of view**
50	33	24
100	65	48
150	95	70
200	130	95
300	189	108
400	250	187

Command Triggering

Default triggering command: TON

Default cancel triggering command: TOFF

Restore factory settings barcode

Scan the barcode below to restore to the default factory settings

Factory settings description	
Serial communication parameters	115200, N,8,1
Default IP Address	192.168.0.100
Default subnet mask	255.255.255.0
OUT1-OUT3 output	Low level is effective
Trigger mode	Normal mode

Sample barcode

1 2 3 A B C
Code 39

ABCD1234
Code 128

0 12345 67890 5
UPC A

9 783456 789019
EAN-13

A 1 2 3 4 5 6 7 8 B
Codabar

5 5 6 7 8 9 0 1 2 3

Interleaved 2/5

PDF 417

Data Matrix

MicroPDF

QR code

AZte

Legal Notice

infoscan trademark and logo are registered trademarks of Nanjing Bilin Intelligent Identification Technology Co., Ltd. (hereinafter referred to as "Bilin Intelligence") within the territory of the People's Republic of China.

The images in this document are for reference only. If there are images that do not match the actual product, please refer to the actual product. Bilin Intelligence reserves the right to modify the documentation at any time without prior notice for any improvements or updates to this product.

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Declaration of Conformity

Ethernet and data port connections can be connected to industrial sites or buildings with routing while no routing outside the industrial site or building.

This product is only for qualified personnel to install.

Power Supply

This product can only be used with the original infoscan DC power adapter, or DC power supplies and other power devices verified and authorized by Bilin Intelligence's personnel.

EMC Compliance

In order to meet EMC requirements:

- It is recommended to connect the base of the barcode reader to factory ground (with a ground resistance of less than 100 Ω) through a wire with a length of less than 100mm.

Instructions for Using LED

- Please follow the steps specified in the manual for control and adjustment, otherwise, it may cause dangerous LED radiation.

- Please be sure to follow the below precautions, otherwise it may cause harm to human body (eyes or skin).
- Do not directly gaze at LED light and specular reflection light.
- Do not disassemble, repair or modify this product on your own.
- Do not use optical instruments (such as magnifying glasses, microscopes, etc.) to observe the LED light of the device.

Laser Safety

- This product may include an aiming laser source for positioning the barcode reader.
- Do not disassemble, repair or modify this product by your self.
- The product meets relevant requirements of IEC 60825-1.
- Please control and adjust according to the steps specified in the manual, otherwise, it may cause harm to human body (eyes or skin).

Product Safety Precautions

- Non explosion-proof models should not be used in explosion-proof areas.
- Be sure to turn DC power off before attempting to connect or disconnect the control cables.
- Please strictly follow the instructions when using I/O terminals. If external device is not connected according to the usage

specifications or if the connection exceeds the specified load, this may cause damage to the product itself and prevent it from enjoying warranty services.

- Insert the connector straightly without tilting and then tighten it. Under-tightening can lead to a loose connector due to vibrations, resulting in poor contact.
- Please standardize the use of insulation sheets and screws to avoid on-site static electricity and other abnormal conditions affecting the bar code reader.
- Do not disassemble or modify this product, as this may cause damage to the product and inability to use warranty service.
- Keep devices and cables as far away from high-voltage lines and power cables as possible. Otherwise, it may lead to product or cable failure.
- Do not allow water, oil, corrosive objects or other foreign objects to stick to the product, as this may cause reading errors or damage to the product. Please use a soft dry cloth or a soft cloth soaked with alcohol to wipe any stain on the product.
- Before using this product, please ensure that it operates normally in terms of functionality and performance.