

# Quick Reference Guide

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**FV2X0 Series  
Industrial Barcode Scanner**

Ver.20230720

## Packing list

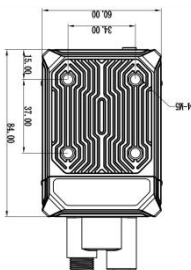
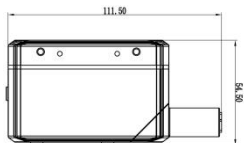
Content	Unit	QTY	Remark
FV2X0 Host	pc	1	
Fixed installation screws	pc	5	Material: nylon
Fixed installation insulating gasket	pc	1	Material: acrylic
L-shaped metal fixing piece	pc	1	Material: stainless steel
Quick Reference Guide	pc	1	

**Product overview -1** (The product shown below is FV220)

1	Reading indicator (reading success, blue; reading failure, red)
2	Laser aimer
3	Lens
4	Array LED light source
5	PWR (Power indicator: red)
6	Ethernet connection indicator (yellow)
7	Ethernet data interaction indicator (green)
8	Button (trigger, display control)
9	Touch screen
10	Circular reading indicator (reading success, blue; reading failure, red)
11	Light source kit buckle
12	USB-TYPE-C interface (reserved, function to be determined)
13	17PIN Aviation connector (Serial communication, power supply, I/O)
14	8PIN Aviation connector (Ethernet communication)
15	M5 Mounting hole

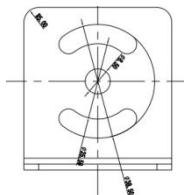
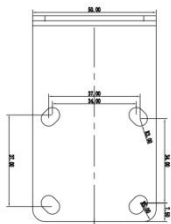
## Product dimensions -1 (The product shown below is FV220)

(unit: mm)

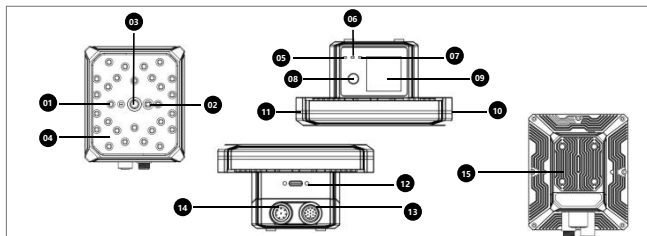


## L-shaped fixing piece sizes

(Compatible with FV220 and FV260 series)

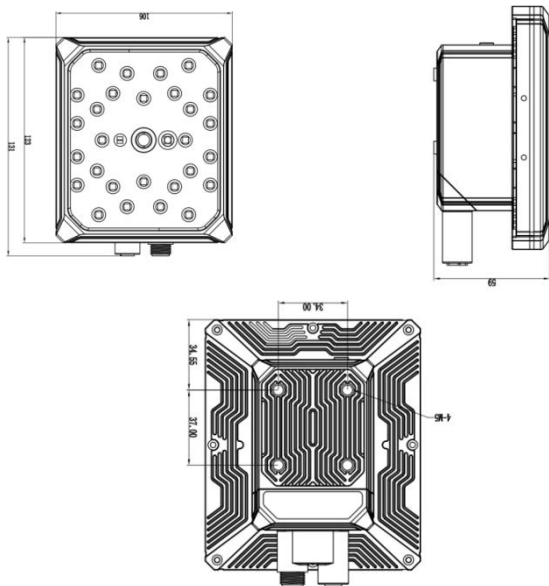


(unit: mm)

**Product overview -2** (The product shown below is FV260)

1	Reading indicator (reading success, blue; reading failure, red)
2	Laser aimer
3	Lens
4	Array LED light source
5	PWR (Power indicator red)
6	Ethernet connection indicator (yellow)
7	Ethernet data interaction indicator (green)
8	Button (trigger, display control)
9	Touch screen
10	Circular reading indicator (reading success, blue; reading failure, red)
11	Mounting hole (reserved)
12	USB-TYPE-C interface ( reserved, function to be determined)
13	17PIN Aviation connector (Serial communication, power supply, I/O)
14	8PIN Aviation connector (Ethernet communication)
15	M5 Mounting hole

## Product dimensions -2 (The product shown below is FV260)



(unit: mm)

## Product connection diagram

### 1. Connection of serial communication

#### a. Connection between host and serial communication cable



The arrow in the figure indicates the connection position of the serial cable

#### b. Connecting the power supply



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

## 2. Ethernet communication connection

### a. Connection of host and Ethernet communication cable



The arrow in the figure indicates the Ethernet cable connection location

### b. Connection of host and Serial communication cable



The arrow in the figure indicates the connection position of the serial cable

### c. Connect the device power supply (the Serial cable is used to be connected with the power supply)



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



## I/O Signal

### 1. Signal terminals appearance

The I/O terminals are located on the Serial cable. If the device is connected to external signals or drives external devices, the terminals need to be used for connection with external devices.



### 2. Definition of signal terminals

Terminal color	Terminal name	Description	Remark
Grey	GND	GND	GND
Yellow	VCC	Power input (Output)	Power output: can provide external equipment power supply (note ①) Power input: can be connected to 20-30V for power supply

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White green	BP1	Low potential	NA
Red blue	COM	Voltage output terminal (+)	Forming voltage feedback with OUT1-OUT3, 5V/24V/external voltage (not exceeding 36VDC)
Black	BP2	Low potential	NA
Blue	GND	GND	GND
Green	IN1	Input signal 1	Logic level (default low level takes effect)
Brown green	IN2	Input signal 2	Logic level (default low level takes effect)
Dusty pink	IN3	Input signal 3	Logic level (default low level takes effect)
Pink	OUT1	Transistor output 1	Optional internal pull-up, effective level selectable (Note ②)
Purple	OUT3	Transistor output 3	Optional internal pull-up, effective level selectable (Note ②)
Red	OUT2	Transistor output 2	Optional internal pull-up, effective level selectable (Note ②)

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

If there is a difference between the color of the wire core and of the table, please refer to the label identification in the end.

Please strictly follow the instructions when using I/O terminals. If external devices are not connected according to the usage specifications or if the connection exceeds the specified load, this may cause damage to the product itself and may not be eligible for warranty and repair services.

### 3. Photoelectric sensor connection

The device defaults to the initial logic, NPN type photoelectric sensor needs to be selected. Connect the photoelectric sensor to the loose wire terminals 1, 2, and 3, the corresponding wire sequence is shown in the table below:

Photoelectric sensor	Signal terminals
+(L+)	1 (DC24V)
-(M)	2 (GND)
-Q	3 (IN1)

Note: The high level range of the input end is 3.3V-24V, please ask to our technical support for other levels.

### 4. Switch connection

Device defaults to the initial logic, taking button switches as an example, connect the switch to loose wire terminals 2 and 3, when the switch is pressed, the trigger takes effect. The wire sequence corresponds to the following table:

Button Switch	Signal Terminals
SW1	2 (GND)
SW2	3 (IN1)

### 5. Relay connection

Device defaults to the initial logic, connect the relay to the loose wire terminals 2 and 3. When the rated voltage is applied externally, the trigger takes effect and the corresponding wire sequence is shown as below table:

Relay	Signal terminals
Normally Open 1	2 (GND)
Normally Open 2	3 (IN1)

## 6. External load connection

Device defaults to the initial logic, open settings interface -> input/output settings -> 24V internal pull-up, connect the 24V of the loose wire terminal to the COM-IN terminal, simultaneously load (taking NPN type alarm light as an example) with positive pole connected to COM-IN terminal, the negative electrode is connected to the OUT output terminal. When reading successfully, the green light will be on, when reading fails, the red light will be on and the alarm will sound. The corresponding table of wire sequence is as follows:

External load (Alarm light as an example)	Signal terminal
+ (Power input wire)	6 (COM-IN)
- (Green light control wire)	7 (OUT1)
- (Red light control wire)	8 (OUT2)
- (Buzzer control wire)	8 (OUT2)

Note: The total maximum working current of the output end load is 350mA, please ask to technical support personnel for other currents.

If external equipment is not connected according to usage specifications or if the connection exceeds the specified load, it may cause damage to the product itself and may not be eligible for warranty and repair services.

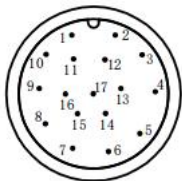
### 7. Relay feedback connection

Device defaults to the initial logic, open the settings interface ->Input/Output settings ->24V internal pull-up, connect the 24V of the loose wire terminal to the COM-IN terminal, simultaneously connect relay coil terminal 1 to COM-IN terminal , Coil terminal 2 is connected to OUT 2 output terminal. Relay operates when reading fails. The corresponding table of wire sequence is as follows:

Relay	Signal terminal
Coil terminal 1	6 (COM-IN)
Coil terminal 2	8 (OUT2)

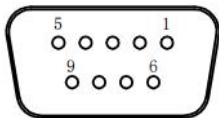
## 8. Cable PIN definition

### 8.1 17PIN Definition of Serial cable



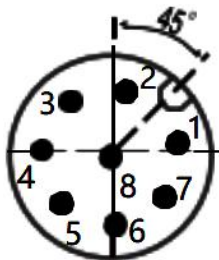
17PIN Aviation Connector	17PIN Cable
1	GND
2	VCC
3	VCC
4	BP1
5	COM
6	TX
7	RX
8	GND
9	BP2
10	GND
11	OUT1
12	IN1
13	IN2
14	IN3
15	OUT3
16	OUT2
17	NA

### 8.2 DP9 female end

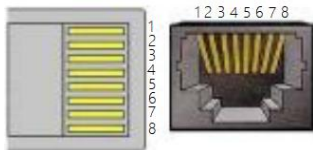


2	TX
3	RX
5	GND

### 8.3 8 PIN Ethernet cable definition



1	TX-
2	RX+
3	RX-
4	DP_B
5	V24+
6	DP_A
7	TX+
8	GND



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



## Setting tool “infostepper” configuration settings (recommended setting methods)

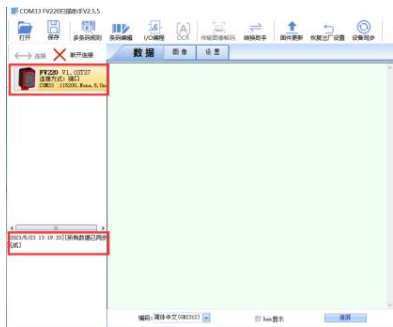
### 1. Connection interface

#### 1.1 RS232 serial port connection method

After the device is directly connected to the computer, first check "Device Manager →" "Port". When connecting the software, click "Connect", and the "Device Connection" window pops up. Select "Serial Port Connection", select the corresponding COM number under "Port Number". If the COM number is not displayed, you can click the refresh button to search.



Click "Connect Device", the interface after successful serial port connection is as follows:

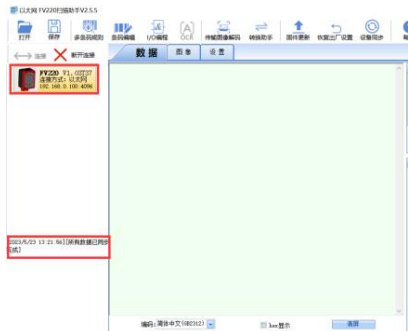


### 1.2 Ethernet connection method

After the device is directly connected to the computer, first modify the IP address parameters of the computer in "Control Panel" → "Network and Internet" → "Network Connections" → "Ethernet Properties" → "TCP/IPv4 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 "Device Connection" window, select "TCP/IP Connection", automatically search and find the current device.



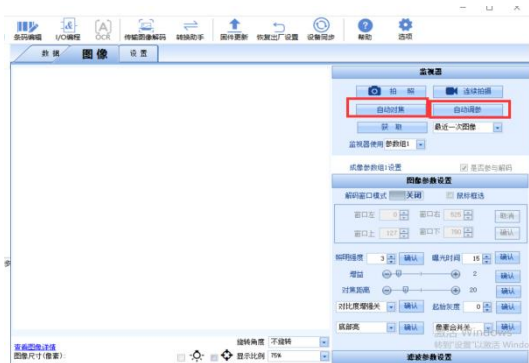
Click on "Connect Device" and the Ethernet connection interface is as follows:



### 2. Image configuring

#### 2.1 Focusing method

##### 2.1.1 Auto-focus



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.



## 2.1.2 Manual focusing



The device is fixed at a certain height, click on continuous shooting to view the real-time image in the image section. Adjust the distance data by clicking on the “plus” or “minus” button of “focus distance” and view the image while adjusting. Adjust until the image is clear and a green box appears around the barcode.

### 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;

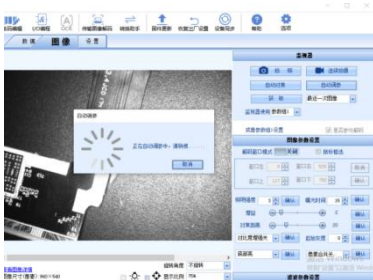
After automatic focusing is completed (focusing successfully), click on “automatic parameter adjustment” to automatically adjust parameters, including exposure time, gain and lighting mode.

If the automatic parameter adjustment is successful, the buzzer will sound a successful prompt and automatically jump to continuous shooting for easy viewing of 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 changed as shown in the following picture to ensure efficient automatic parameter adjustment.

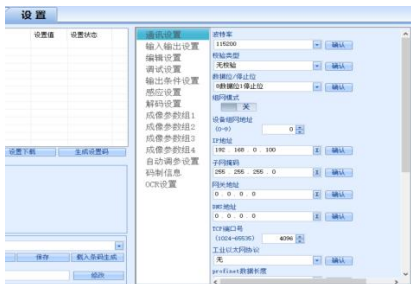
The automatic parameter adjustment process interface is shown as the following figure:



## 2.2.2 Manual parameter adjustment



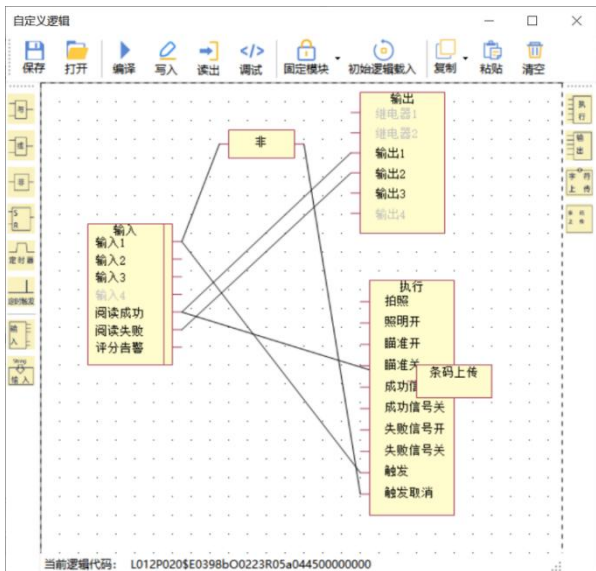
Fix the device at a certain height, click on continuous shooting, view the real-time image in the image section. By modifying the data of lighting intensity, exposure time and gain, view the image while adjusting. Keep adjusting until the green box appears around the barcode.

3. Communication settings interface

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You can modify and set the required communication related items on the settings page.

### 4. I/O Logic setting interface



You can modify and set the required I/O logic through the I/O settings interface.



## Offline setting of display screen

### 1. Initial interface



After the device is powered on and the screen is turned on, this interface will be displayed. Click the OK button to enter the Menu interface.

**Remark:** If the display screen is not operated within 10 seconds, the screen will be shutdown; If you need to operate the screen again, just briefly press the button to wake up the display screen;

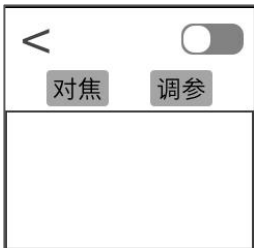
### 2. Menu interface



Click on the Menu icon to enter the corresponding settings interface.

**Remark:** If the display screen is not operated in 2 minutes, the screen will be shutdown; If you need to operate the screen again, just briefly press the button to wake up the display screen; If no operation is performed on this interface, it is recommended to briefly press the button to turn off the screen.

### 2.1 Viewing images in real time



Step 1. Upper right corner switch:



Start continuous shooting after opening the switch (the screen will not be shutdown during continuous shooting), you can view the current image clarity, continuous shooting will be stopped after closing the switch;

Step 2. If the image is blurred, click the focus button and the device will perform automatic focus. The display screen shows that autofocus is in progress. After successful autofocus, a successful prompt will sound and a window for optional focusing distance pops up. Select the appropriate focusing distance and click OK to complete the autofocus. If there are multiple sets of recommendations, select the focusing parameter rearward to ensure clear image viewing.

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Step 3. Click the parameter adjustment button and the device will perform automatic parameter adjustment. The display screen shows that automatic parameter adjustment is in progress. After the automatic parameter adjustment is successful, a successful prompt will sound and exit; If automatic parameter adjustment fails, a failure prompt will sound, parameter adjustment is terminated.

Step 4. Click Return button: < return to the Menu

**Remark:** In the real-time viewing interface, the switch is set to shutdown, the screen will be turned off after 2 minutes; If you need to operate screen again, just briefly press the button to wake up the display screen and return to the Menu interface; If no operation will be performed on this interface, it is recommended to briefly press the button to turn off the screen.

### 2.2 Barcode reading verification




Step 1. Upper right corner switch:  default is off, open, device performs decoding information statistics (the screen will not be turned off during the decoding information statistics process);

Step 2. Read barcode through key triggering. For every successful reading, "OK" corresponds to a change in count; Every failed reading, "NR" corresponds to a change in count, "Rate" will automatically calculate and generate the decoding success rate. "OK", "ERR", "Rate" represent the number of decoding successes, decoding failures and decoding success rate respectively;

Step 3. Clear button: Click this button to clear the decoding information statistics to 0;

Step 4. If there are significant cumulative changes in NR count, it indicates that it is in a non-optimal state of image focusing or parameter adjustment; Suggest readjusting image related parameters;

Step 5. Turn off the barcode reading information statistics switch and click Return button , return to the real-time image viewing to configure image related parameters;

**Remark:** In the real-time viewing interface, if the switch setting is turned off, the screen will be turned off after 2 minutes; If you need to operate the screen again, just briefly press the button to wake up the display screen and return to the Menu interface; If no operation is performed on this interface, it is recommended to briefly press the button to turn off the screen.

## Technical parameter specifications

Model	FV220 series	FV260 series
Sensor	1/3 inch CMOS sensor, global shutter	
Image Resolution	1920*1080	
Collection Speed	Up to 100 FPS	
Lens Type	Liquid lens	
Lens Focal Length	FV2X0N: 6mm FV2X0S: 12mm	
Viewing Angle	FV2X0N: 45° (horizontal) 26° (vertical), FV2X0S: 21° (horizontal) 13.5° (vertical)	
Roll/ Pitch/ Yaw	360° (roll) 65° (pitch) 65° (yaw)	
Triggering Mode	Command triggering; I/O triggering; inductive triggering; continuous triggering; key triggering	
LED Indicator	Top position: 3 LED indicators (power supply, Ethernet connection and sending/receiving status indication); Around the body: blue (reading success), red (reading failure)	
Lighting Source Type	Standard light source - 16pcs LED	Array lighting - 28pcs LED, body light source - high brightness/polarization
Lighting Source Color	Red	
Light Source Kits	Polarized/Atomized/Polarized+Atomized, etc.	NA
Reading Area	Blue (reading success) Red (reading failure)	
Aiming Mode	Laser aiming	
Laser Safety Level	Class2	
Host Screen	1.3 inch, 240*240 pixels, capacitive touch screen	
Communication Interface	Ethernet, Serial port	
Communication	Serial: RS232; Ethernet: TCP/IP, FTP, Profinet, Modbus TCP, EtherNet/IP	
Operating Voltage	20-28 VDC	
Power Consumption	Standby: 3.7W, Peak: 27W, Average: 6.7W	Standby: 4W, Peak: 23.7W

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<b>Number of Input</b>	3	
<b>Effective Voltage of Input Signal</b>	≤1.5V	
<b>Number of Output Signals</b>	3	
<b>Output Signal Type</b>	Voltage signal	
<b>Output Load Capacity</b>	Maximum 350mA@24VDC	
<b>Housing Material</b>	Aluminium alloy	
<b>Weight</b>	330g	500g
<b>Dimensions (L*W*H)</b>	112mm*60mm*53mm	131mm*106mm*58mm
<b>Operating</b>	0°C ~ 55°C	
<b>Storage Temperature</b>	-20°C ~ 70°C	
<b>Relative Humidity</b>	0°C~95% non-condensing	
<b>ESD Protection</b>	Air discharge: ±18KV, Contact discharge: ±8KV	
<b>Vibration Resistance</b>	10 to 55 Hz, dual amplitude 0.3mm, 1 hour in X, Y or Z directions	
<b>IP Grade</b>	IP65	
<b>Certification</b>	CE, RoHS, etc.	
<b>Readable Code Symbolgies</b>	All 1D, 2D and stacked barcodes in accordance with national and international standards	
<b>Maximum Reading Accuracy</b>	FV2X0N and FV2X0S 1D codes: 1.3mil; 2D codes: 2mil	

## Reading distance and visual field

unit: mm

Barcode specifications	FV220N/FV260N		FV220S/FV260S	
	Nearest	Farthest	Nearest	Farthest
5mil Code 128	30	621	40	750
6.67mil Code 128	25	763	40	820
10mil Code 128	28	1001	35	1230
15mil Code 128	32	1005	40	1400
5mil DataMatrix 10bit	25	128	40	207
6.67mil DataMatrix 10bit	25	194	40	354
10mil DataMatrix 10bit	25	275	40	543
15mil DataMatrix 10bit	25	490	40	751

Reading distance	FV220N/FV260N 6mm focal length lens		FV220S/FV260S 12mm focal length lens	
	X-axis field of view	Y-axis field of view	X-axis field of view	Y-axis field of view
50	45	25	28	15
100	90	50	45	27
300	250	140	132	73
500	415	230	208	115
800	680	370	338	187
1000	830	463	410	232

## Trigger character

Default trigger Character: TON

Default End trigger Character: TOFF

## Standard product default settings

Scan the barcode below restoring to default factory settings.



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### Factory default 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 mode
Triggering 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**

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## **Declaration of Conformity**

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

This product is only for qualified personnel to install.

## **Power Supply**

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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**

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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  $\Omega$ ) through a wire with a length of less than 100mm.

## **Instructions For Using LED**

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- 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 view directly with optical instruments. Viewing the LED output with certain optical instruments (for example, eye loupes, magnifiers and microscopes) within a distance of 100 mm may pose an eye hazard.

## Laser Safety

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

## Product Safety Precautions

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- 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 cable.
- Please strictly follow the instructions when using I/O terminals. If external equipment 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 and repair services.
- Insert the connector straight so that it is not tilted and then tighten it securely. 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 barcode reader.
- Do not disassemble or modify this product, as this may cause damage to the product and unable to receive warranty service.
- Keep equipment and cables as far away from high-voltage lines and power cables as possible. Otherwise, it may lead to product failure 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 substances on the product.
- Before using this product, please ensure that it operates normally in terms of functionality and performance.