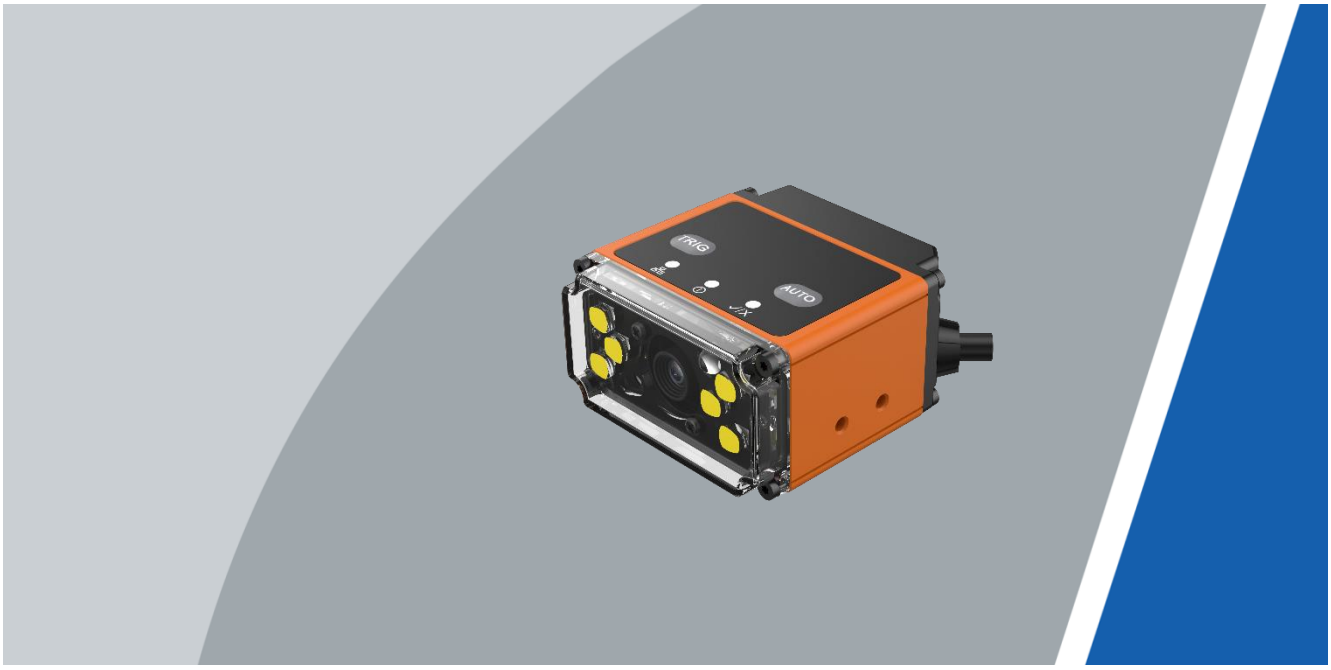
Smart Code Reader(3000 Series)

User's Manual



V1.3.1

Foreword

General

This document introduces the Settings and operations of 3000 series intelligent code reader (hereinafter referred to as "the Reader"). Read carefully before using the device, and keep the manual safe for future reference.

Safety Instructions

The following signal words might appear in the manual.

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

Revision History

Version	Revision Content	Release Time
V1.1.0	First release.	
V1.2.0	Updated some functions and operations.	2022.6.1
V1.3.0	Content Optimization	2023.4.12
V1.3.1	Client manual stripping	2024.6.17

Important Safeguards and Warnings

This section introduces content covering the proper handling of the device, hazard prevention, and prevention of property damage. Read carefully before using the device, and comply with the guidelines when using it.

Operating Requirements

- Do not install or place the device in a location that exposes it to sunlight or heat sources. Ensure that the shell temperature is controlled below 60°C.
- Keep the device away from dampness, dust or soot. If the camera is not connected to the lens, you must cover the lens cap to avoid dust.
- Install the switch horizontally on a stable surface to prevent it from falling.
- Do not drip or splash liquid onto the device, and make sure that there is no object filled with liquid on the device to prevent liquid from flowing into it.
- Install the device in a well-ventilated place, and do not block the ventilation of the Parking Detector.
- Operate the Parking Detector within the rated range of power input and output.
- Do not dissemble the device.
- Transport, use, and store the device under the allowed humidity and temperature conditions.
- The device is a class I electrical appliance. Make sure that the power supply of the device is connected to a power socket with protective earthing.

Power requirements

- Use the power cords that are recommended for the region and conform to the rated power!
- Use the standard power adapter. We will assume no responsibility for any problems caused by the use of a nonstandard power adapter.
- Use power supply that meets SELV (extra low voltage) requirements, and supply power with rated voltage that conforms to Limited Power Source in IEC60950-1. For specific power supply requirements, please refer to device labels.
- The device is a class I electrical appliance. Make sure that the power supply of the device is connected to a power socket with protective earthing.

Table of Contents

1 Overview

1.1 Product Introduction

The code reader adopts high performance photo-sensitive chip and the maximum transmission rate of 100 Mb/s can meet the requirements of most industrial applications. It can work stably in various poor environments, which makes it an industrial camera with high stability at low cost.

1.2 Product Features

- Small size, flexible installation, and various operating distances are available.
- With the integrated light source design, the reader supports both red and white light sources, which is suitable for various code reading optical scenes.
- Abundant port such as I/O port, Ethernet port, RS-232 port and GPIO port. Supports multiple communication protocols.
- Adopts industrial-grade M12 connector, which is IP65 rated.
- Support sophisticated code reading formats and code quality assessment.

1.3 Product Structure

1.3.1 Product Dimensions

The product dimensions of the red and white light model are shown in the figure.

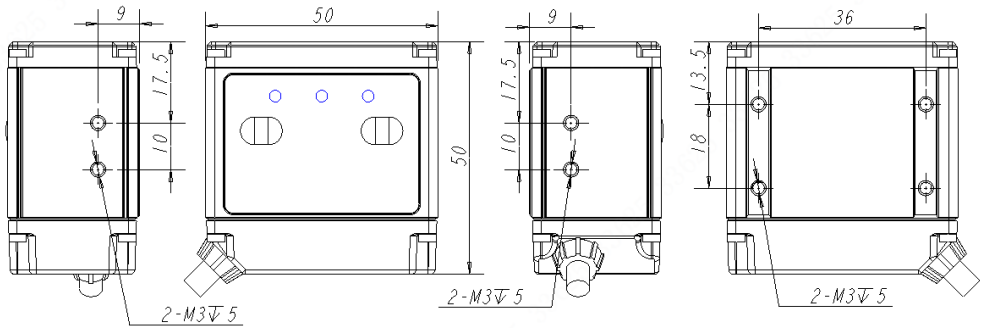


Figure 1-1 Appearance dimensions (50 mm x 50 mm x 28 mm) (Unit: mm)

The product dimensions of the white light model are shown in the figure.

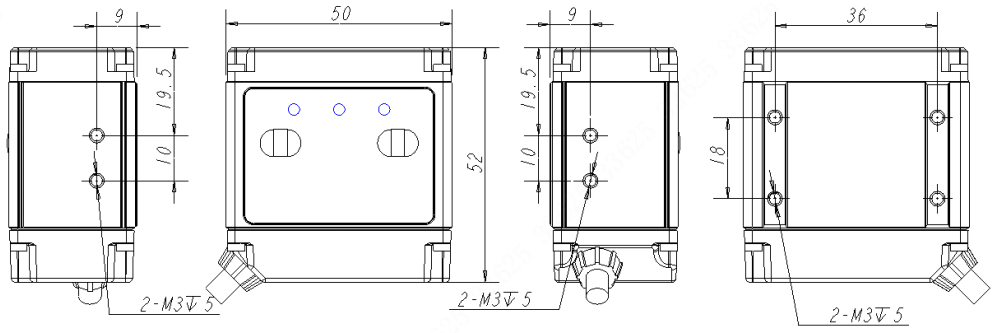


Figure 1-2 **Appearance (52 mm x 50 mm x 28 mm) (Unit: mm)**

1.3.2 Product Appearance

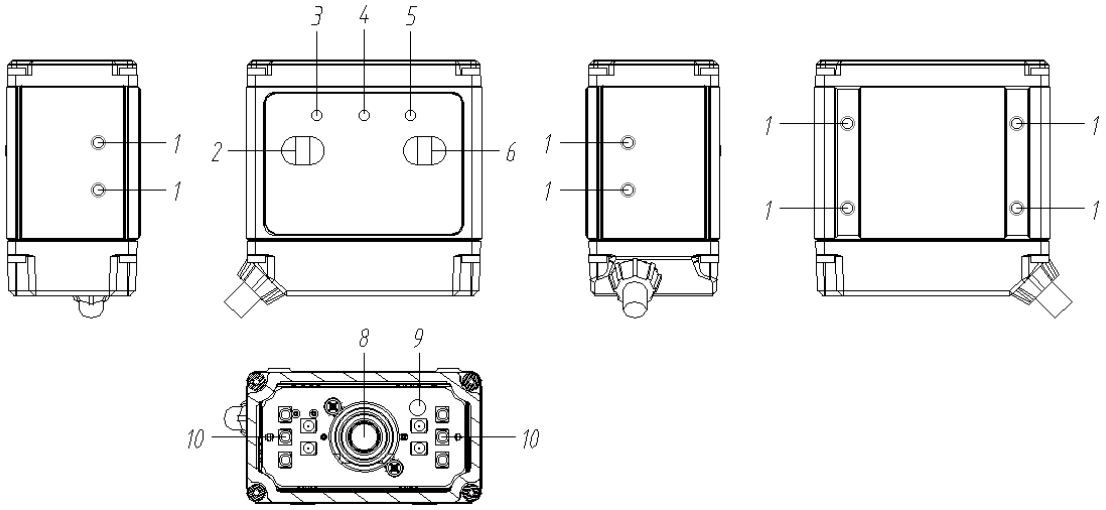


Figure 1-3 **Red and white light fixed-focus models**

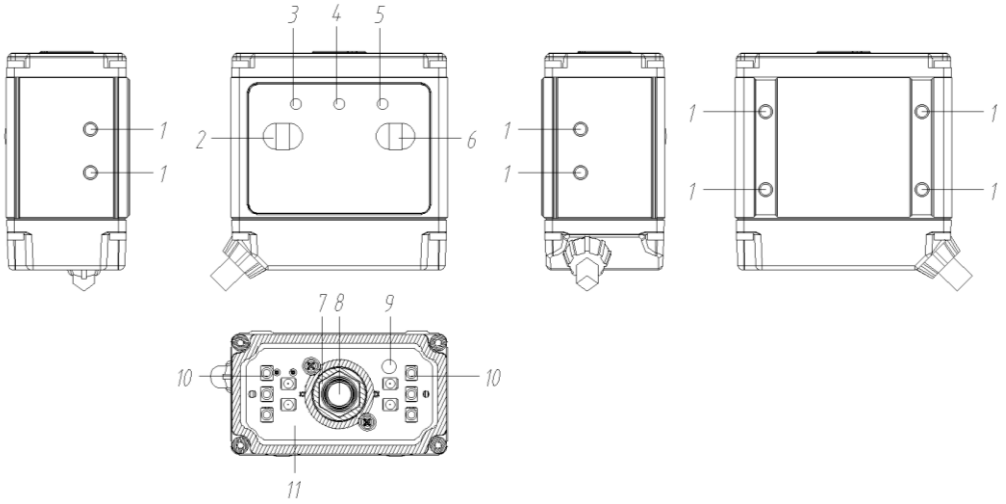


Figure 1-4 **Red and white light fixed-free models**

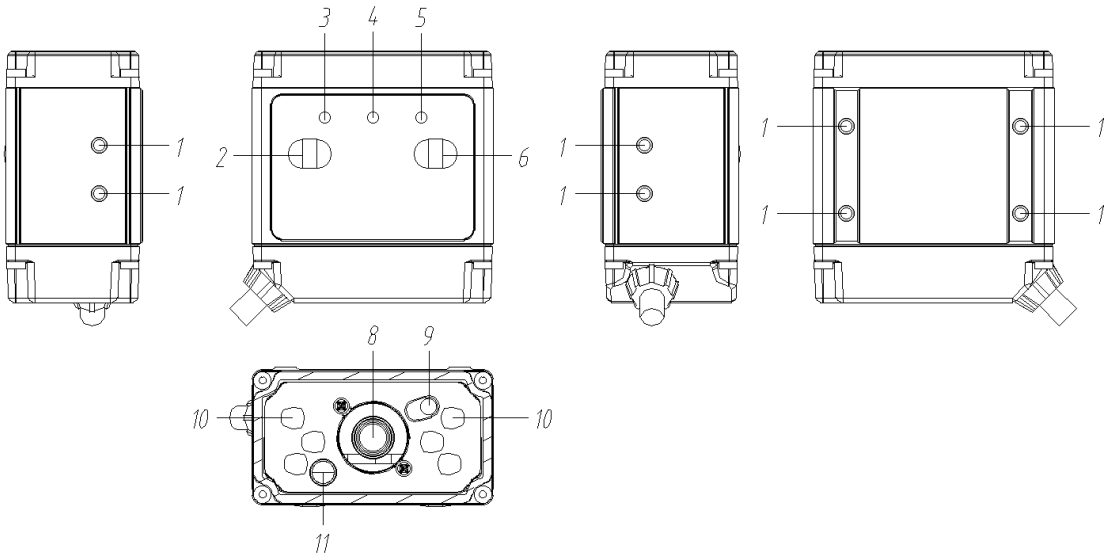


Figure 1-5 **White light enhanced fixed-focus models**

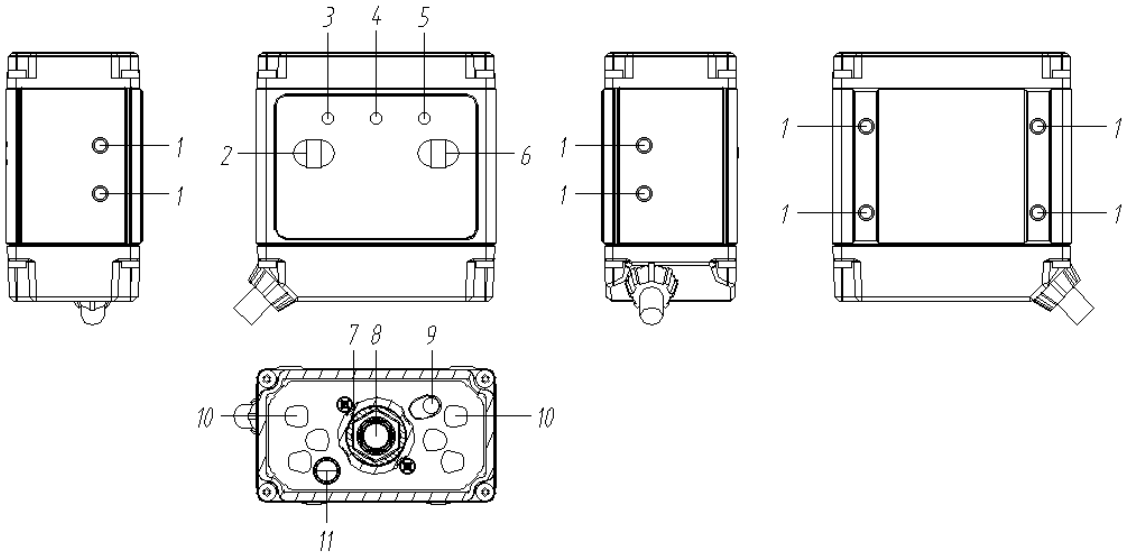


Figure 1-6 White light enhanced fixed-free models

Table 1-1 Device components introduction

No.	Name	Description
1	Installation hole	You can use the M3 size screws included in the box to fix the device.
2	AUTO	When you hear the ticking sound, press the button once fast and hold the button for 3 s to initiate intelligent parameter adjustment.
3	Decoding indicator	The green light is on and the red light is off indicates the decoding success, whereas the red light is on and the green light is off indicates the decoding failure.
4	Power indicator	Power indicator light is on solid green when the power supply is normal, and solid off when it is abnormal.
5	Link indicator	Network indicator light is on solid green after network is connected.
6	TRIG	When the device is in trigger mode, it can be triggered once by pressing the button.
7	Focusing nut	Use the focusing wrench attached to the cable to adjust the focus to make the image clear and so as to achieve better decoding effect.
8	Image sensor	The user acquires image data.
9	Aimer	It used for positioning.
10	Illuminator	LED light source for filling light when capturing images to ensure the image effect. Red and white light models: 2 light source red/white light, can be controlled respectively solid bright, strobe and out. White light models: Left and right 2 sides of the white light, can be controlled respectively solid bright, strobe and out.
11	Green dot indicator	After the green dot indication function is enabled, the indicator light is solid on for 3 s when the device meets the specified number of decodes.

- As shown in the following figure, align the focusing wrench and insert it into the focusing nut. Then you can rotate the focusing wrench left and right to achieve the manual focusing.

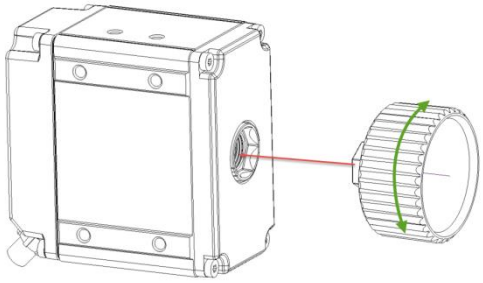


Figure 1-7 **Focusing diagram**

Port Description

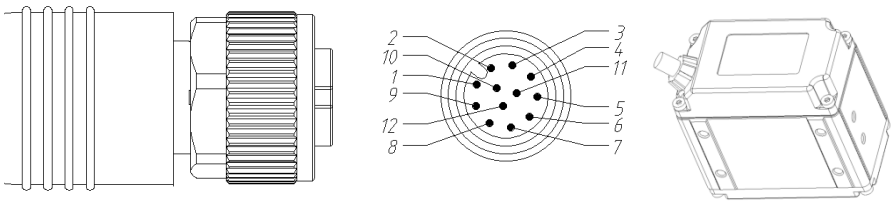


Figure 1-8 **Device port**

The specific pin signals of the device are defined as follows.

Table 1-2 **Pin signal description**

No.	Name	Feature	Description	Cable core color	
1	Power	Power input	DC5.5 female power interface		Red
2	POWER_GND	Power GND	DC5.5 female power interface		Black
3	OPT_OUT0	Opto-isolated output	Brown bare wire		Brown
4	OPT_GND	Opto-isolated GND	Purple/white bare wire		Purple and white
5	OPT_IN0	Opto-isolated input	Yellow bare wire		Yellow
6	GPIO	Configurable I/O	Blue bare wire		Blue
7	MD1_P	—	RJ-45 network port		Green
8	MD1_N	—	RJ-45 network port		Green and white
9	MD0_P	—	RJ-45 network port		Orange
10	MD0_N	—	RJ-45 network port		Orange and white
11	RS232_RXD	Serial port receiving	Purple bare wire		Purple
12	RS232_TXD	Sending data by serial port	Gray bare wire		Gray

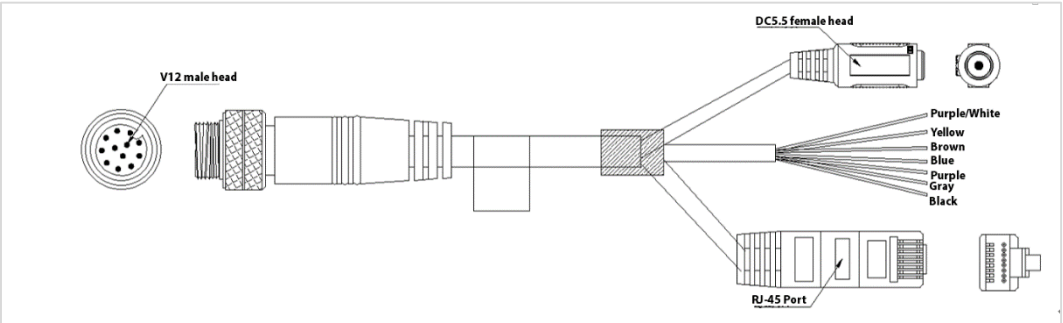


Figure 1-9 Cable diagram for the 3000 series code reader

- When using the device, it is recommended to use the cable as shown above.
- The power supply of the cable corresponding to pin 1 and pin 2 of the interface has been turned to DC5.5 female head, so no wiring is required.
- The power supply of the cable corresponding to pin 7, pin 8, pin 9 and pin 10 of the interface has been turned to RJ-45 network ports, so no wiring is required.
- The cables going from the other pins of the interface can be wired according to the actual use requirements.
- Ground for bi-directionally configurable I/Os shared with power ground.

⚠

- Reverse power connection: There is protection inside, only the device cannot operate.
- I/O cable reverse connection: Input cable connection is incorrect, but output reversal will damage the circuit.

2 Electrical Specifications

2.1 Power and Network Port Electrical Specification

Table 2-1 Power and network port electrical specification

Parameter	Description
Camera power specifications	+9 VDC to +26VDC, <1% ripple, powered through camera 12-pole M12 connector. At least 26 AWG cables are required.
Data output port	100 Mbps Ethernet.
Enter Input/output port	● 1 Opto-isolated input. ● 1 Opto-isolated output. ● 1 GPIO port (can be configured to input or output mode).
Authentication	CE, FCC and KC.

- The power supply must meet SELV and LPS specifications.
- The device shell is sprayed with insulating paint.

2.2 I/O Interface Electrical Specification

2.2.1 Opto-isolated Input

Table 2-2 Opto-isolated input voltage parameter

Input voltage	Description
+26 VDC	Extreme voltage. The voltage cannot exceed the value. Otherwise, the device might be damaged.
+0 to +24 VDC	Security working voltage range for I/O input.
+0 to +6 VDC	Logic 0.
+6 to +9 VDC	The input status changes and the logic status is unsteady within this range.
>+9 VDC	Logic 1.

The typical circuit for the opto-isolated input is shown in the following figure.

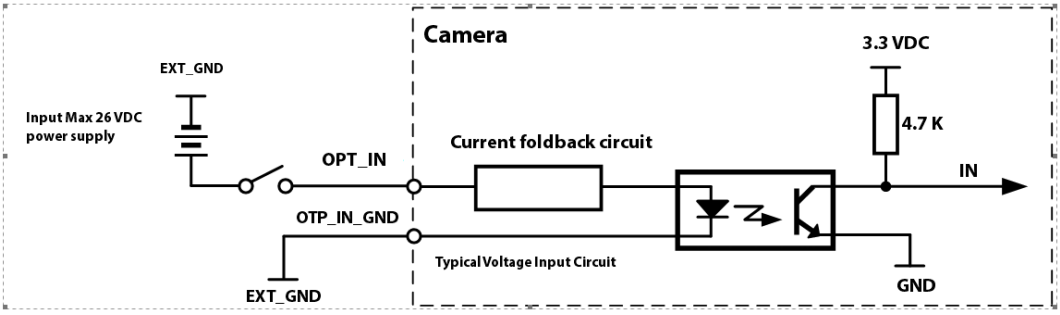


Figure 2-1 Opto-isolated input typical circuit

The relationship between the Sink current and the input voltage for the opto-isolated input port is shown as follows.

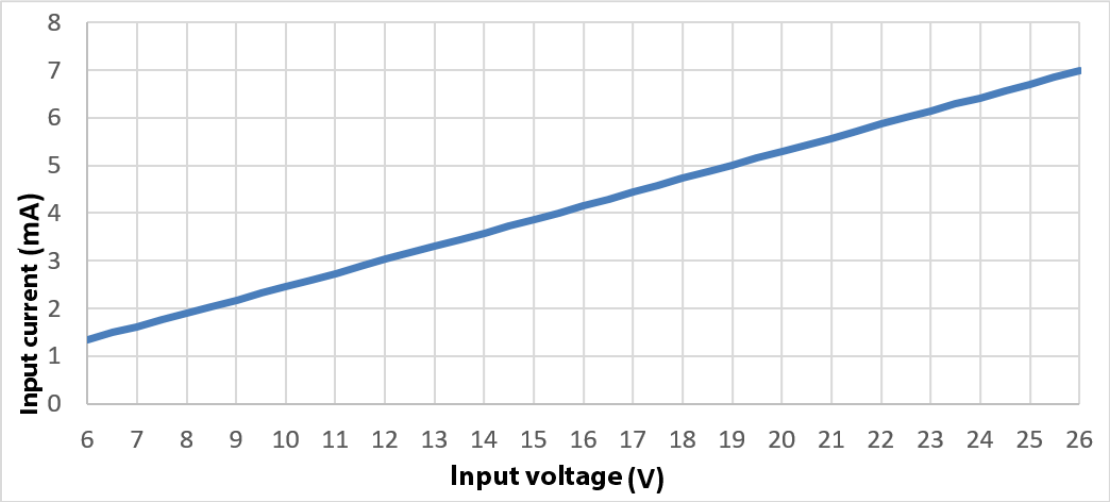


Figure 2-2 Opto-isolated input characteristic curve

- The maximum Sink current of the opto-isolated isolated input is 7 mA.
- Values mentioned above are measured when the environment temperature is 25°C. There are individual differences between cameras.

The relationship between input signal amplitude and trigger delay is shown below.

Table 2-3 Opto-isolated input signal amplitude versus trigger delay

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

- The trigger input delay measures the delay from the external opto-isolated input port to the FPGA input pin, regardless of the FPGA internal logic delay.

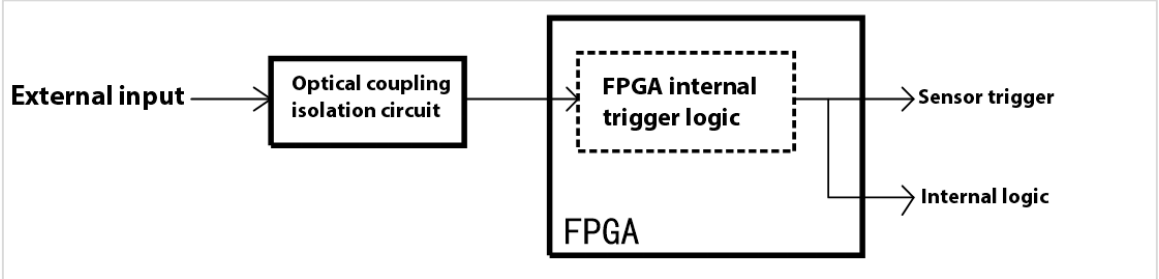


Figure 2-3 FPGA internal logic

The requirements for the minimum input pulse width of the trigger input signal are as follows.

Table 2-4 **Minimum pulse width requirement for opto-isolated input signal**

Input signal amplitude (Vp-p)	Minimum positive pulse width (us)	Minimum negative pulse width (us)
9	36.00	90.00
12	10.10	90.00
20	3.10	90.00
24	2.40	90.00
26	2.10	90.00

2.2.2 Opto-isolated Output

Table 2-5 **Opto-isolated output**

Voltage	Description
+26 VDC	Extreme voltage. Input voltage cannot exceed the value. Otherwise, the device might be damaged.
<+3.3 VDC	Possible error on I/O output.
+3.3 to +24 VDC	Security working voltage range for I/O output.

The typical circuit for the opto-isolated output is shown in the following figure.

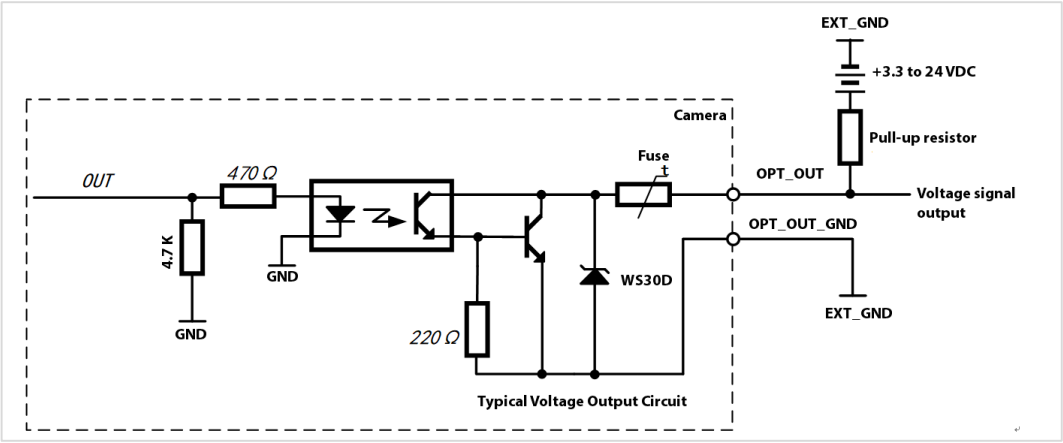


Figure 2-4 **Opto-isolated output typical circuit**

The rising/falling time, and rising/falling edge.
trigger delay time are shown as below when the pull-up resistance is 1 Ω.

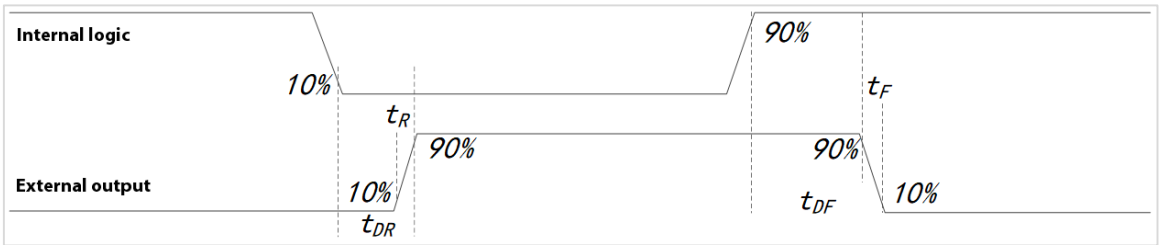


Figure 2-5 **Trigger delay time**

Table 2-6 **The relationship between output signal amplitude and trigger delay is shown below.**

External power Voltage (V)	Rising Time tR (us)	Falling Time tF (us)	Rising edge Rising edge trigger delay tDR (us)	Falling edge Falling edge trigger delay tDF (us)
5	19.70	3.20	39.9	8.06

12	24.06	5.22	44.8	11.8
24	30.11	8.10	44.8	53.2

- The output delay measures the delay from the internal FPGA logic output to the external opto-isolated output pin, regardless of the internal logic delay of the FPGA.
- Values mentioned above are measured when the environment temperature is 25°C. There are individual differences between cameras.

The relationship between the opto-isolated output on-voltage drop and output current is shown below.

Figure 2-6

Figure 2-7 Opto-isolated output characteristic curve

- The maximum on-voltage drop at the output of the opto-isolated is 2.35 V (measured at a maximum output current of 100 mA).
- Values mentioned above are measured when the environment temperature is 25°C. There are individual differences between cameras.

2.2.3 GPIO

2.2.3.1 GPIO as an Input Port

Table 2-7 GPIO as input voltage parameter

Input voltage	Description
+26 VDC	Extreme voltage. Input voltage cannot exceed the value. Otherwise, the device might be damaged.
+0 to +24 VDC	Safe operating voltage input range (minimum 3.3 VDC when an external pull-up resistor exists).
+0 to +0.8 VDC	Logic 0.
> +0.8 to +2.2 VDC	The input status changes and the logic status is unsteady within this range.
>+2.2 VDC	Logic 1.

The typical circuit for the GPIO input is shown in the following figure.

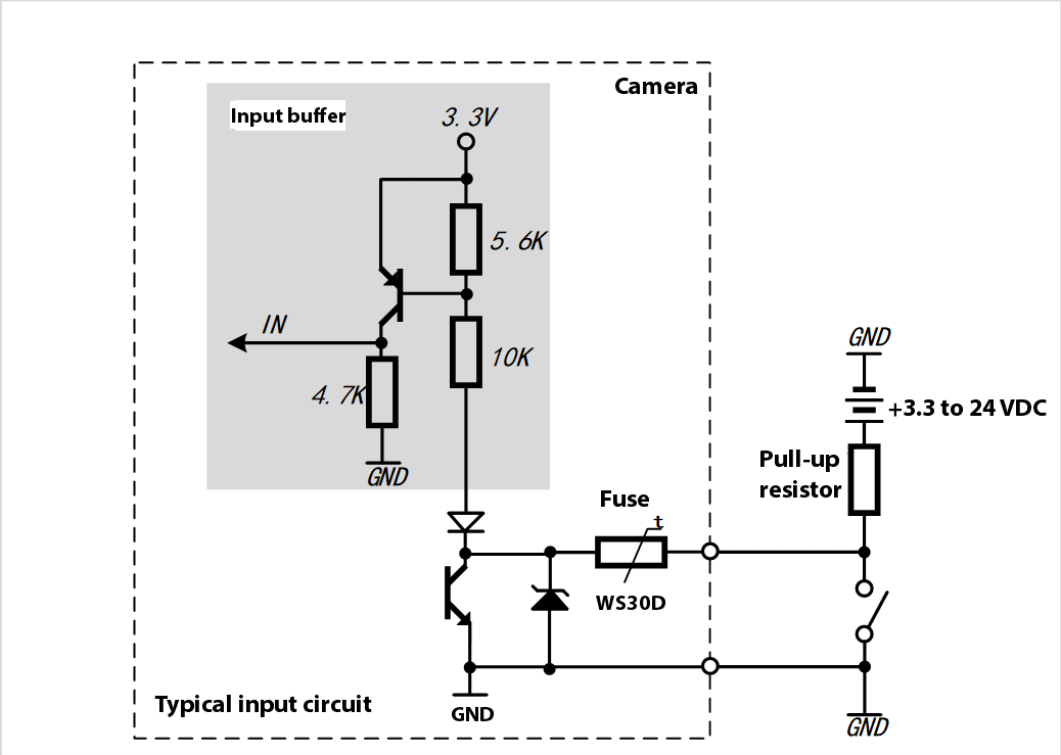


Figure 2-8 GPIO input typical circuit

The relationship between GPIO input signal amplitude and trigger delay is shown below.

Table 2-8 Relationship between GPIO input signal amplitude and trigger delay

Input signal Amplitude (Vp-p)	Rising edge Rising edge trigger delay tDR (us)	Falling edge Falling edge trigger delay tDF (us)
3.00	6.783	0.339
5.00	6.563	0.200
9.00	6.164	0.106
10.00	6.416	0.960

- The trigger input delay measures the delay from the external GPIO port to the FPGA input pin, regardless of the FPGA internal logic delay.
- The GPIO input port supports the shortest input positive pulse of 20 μs (typical value) and the shortest input negative pulse of 2 μs (typical value).
- The GPIO interface has less delay than the opto-isolated interface.

The relationship between the Sink current and the external input voltage when GPIO is used as an input is shown below.

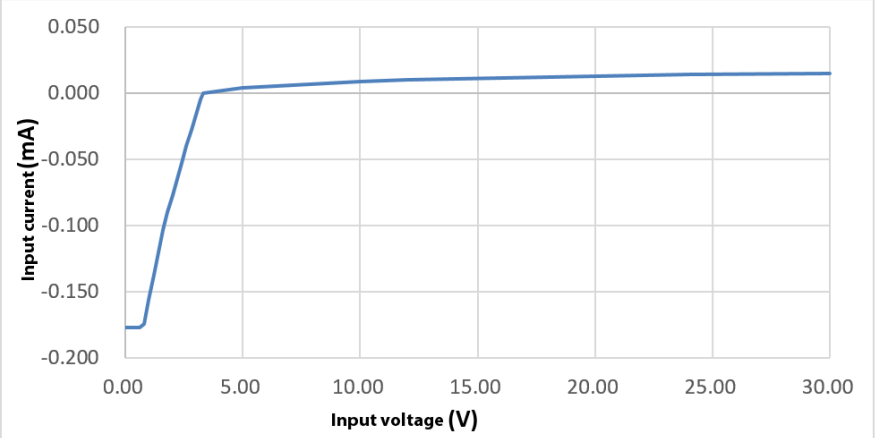


Figure 2-9 **GPIO input characteristic curve**

- The maximum Sink current for the GPIO input is 15 μA (measured at 30 V external input voltage).
- Values mentioned above are measured when the environment temperature is 25°C. There are individual differences between cameras.

2.2.3.2 GPIO as an Output Port

Table 2-9 **GPIO as the output voltage parameter**

Voltage	Description
+26 VDC	Extreme voltage. Output voltage cannot exceed the value. Otherwise, the device might be damaged.
+3.3 to +24 VDC	The security working voltage range when output.
-3.3 VDC	Possible error on I/O output.

Up to 50 mA Sink current when the GPIO port is used as output, a typical circuit for the GPIO output is shown below.

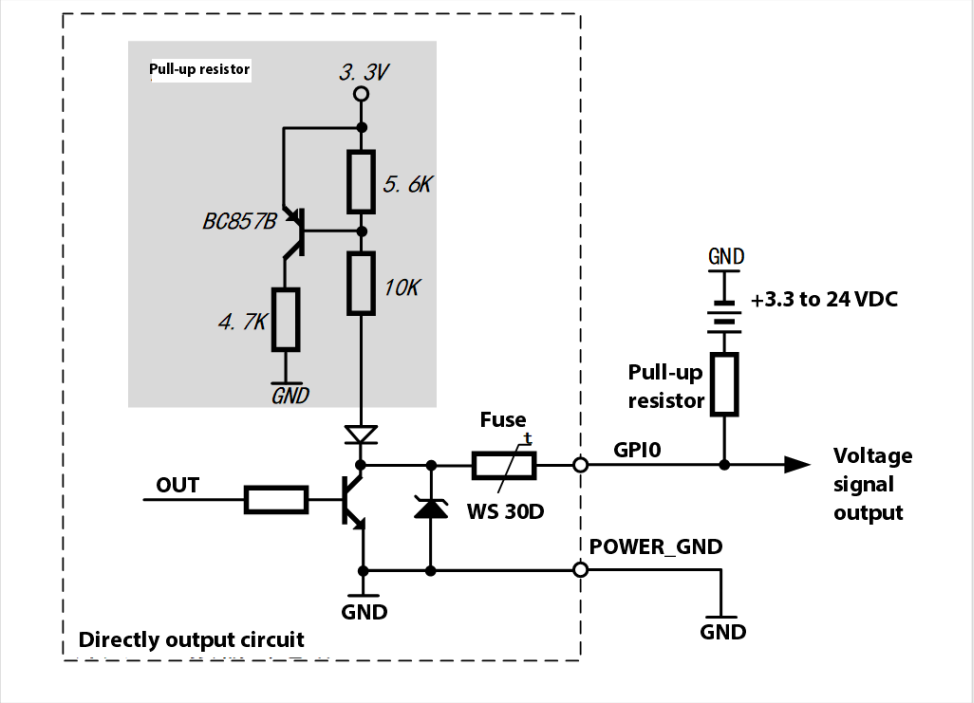


Figure 2-10 **GPIO output typical circuit**

The relationship between GPIO output on-voltage drop (voltage drop between GPIO and GND) and output current (current flowing into GPIO pin) is as follows.

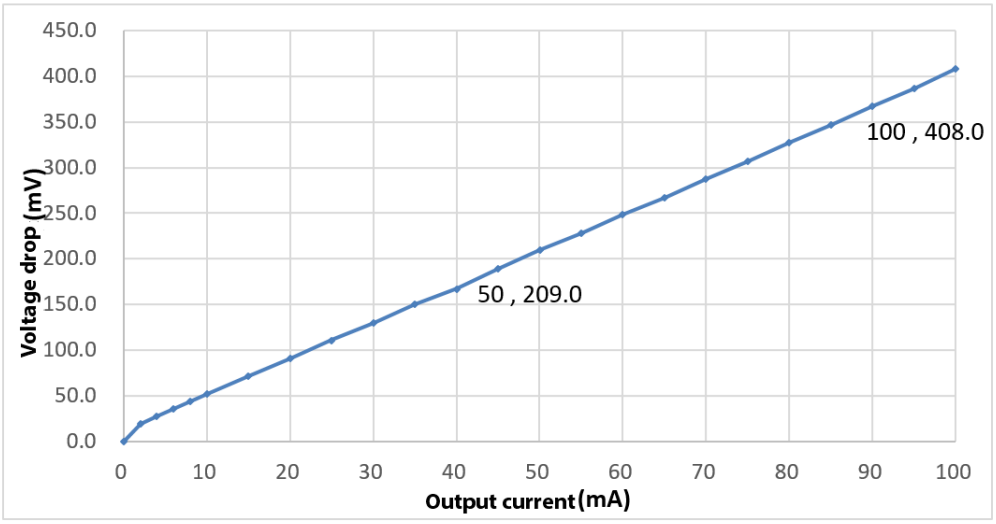


Figure 2-11 GPIO output characteristic curve

- Values mentioned above are measured when the environment temperature is 25°C. There are individual differences between cameras.

The maximum on-voltage drop when GPIO is used as an output is 0.41 VDC (100 mA output current).

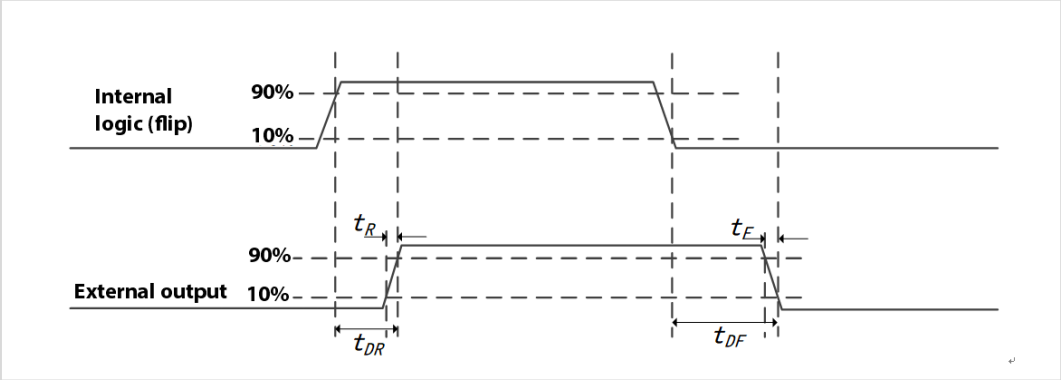


Figure 2-12 Rising time and falling time

The rising/falling time, and rising/falling edge
trigger delay time are shown as below when the pull-up resistance is 470 Ω as shown below.

Table 2-10 Relationship between GPIO output signal and trigger delay time

External power Voltage (V)	Rising Time tR (us)	Falling Time tF (us)	Rising edge Rising edge trigger delay tDR (us)	Falling edge Rising edge trigger delay tDF (ns)
Null	—	—	5.43	0.35
5	0.16	0.02	1.80	39
12	0.22	0.04	2.37	71

- The output delay measures the delay from the FPGA pin to the GPIO pin, regardless of the FPGA internal logic delay.
- When no external pull-up resistor exists, the shortest output positive pulse is 11 μs and the shortest output negative pulse is 1 μs.
- The GPIO interface has less delay than the opto-isolated page.

2.3 I/O External Wiring

2.3.1 Opto-isolated Input

Opto-isolated input supports sensors with NPN/PNP/push-pull structure outputs.

2.3.1.1 NPN Output Sensor

- Method1: A pull-up resistor is not added (Recommended).

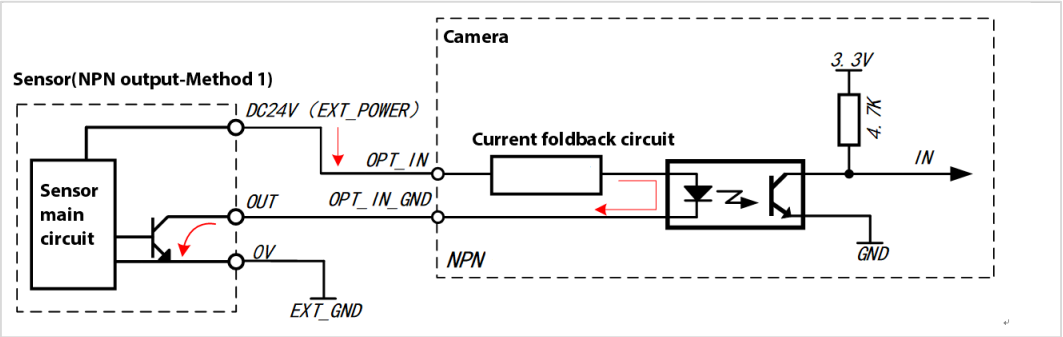


Figure 2-13 NPN wiring method1:

- Method 2: Add pull-up resistor is added.

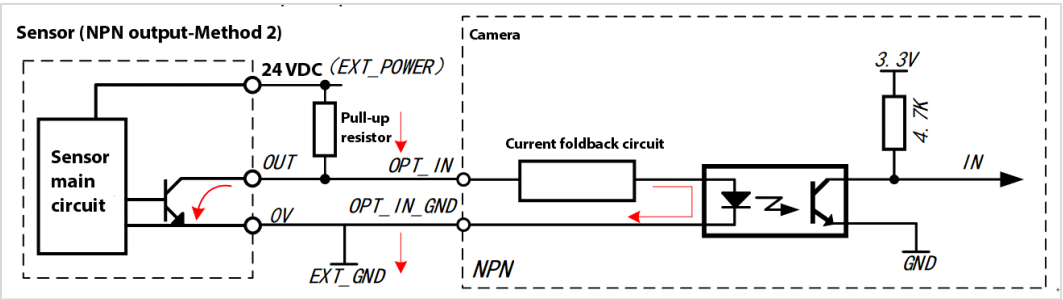


Figure 2-14 NPN wiring method2

- EXT_POWER refers to the positive value of the external power supply connected to the user, and EXT_GND refers to the ground where the external power supply connected to the user is connected. They can be a single switching power supply or a sensor power supply.
- This method is suitable for the sensor with NPN open collector output structure.
- The recommended value for pull-up resistor are as follows: 1 kΩ at 3.3 V, 1 kΩ at 5 V, 2.4 kΩ at 12 V, and 4.7 kΩ at 24 V. When the output current capacity needs to be improved, the resistor can be selected below 1kΩ, but the rated power should be used above 1W.
- In some models, OPT_IN_GND and OPT_OUT_GND share the name OPT_GND.

2.3.1.2 PNP Output Sensor

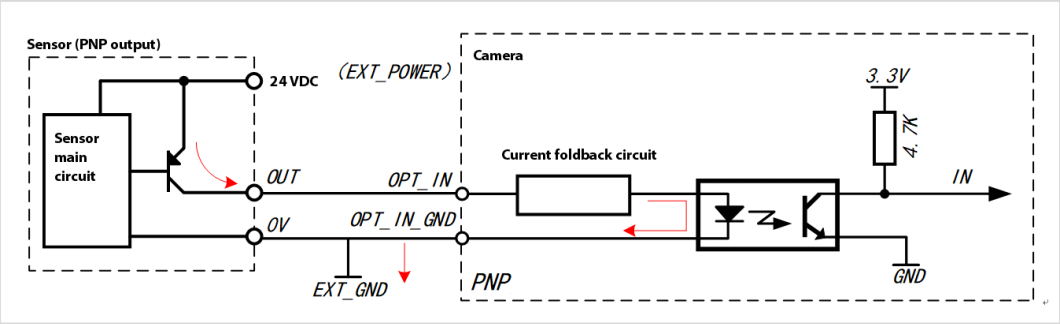


Figure 2-15 Patch wiring method

2.3.1.3 TTL outputs or Push-pull Outputs Sensor

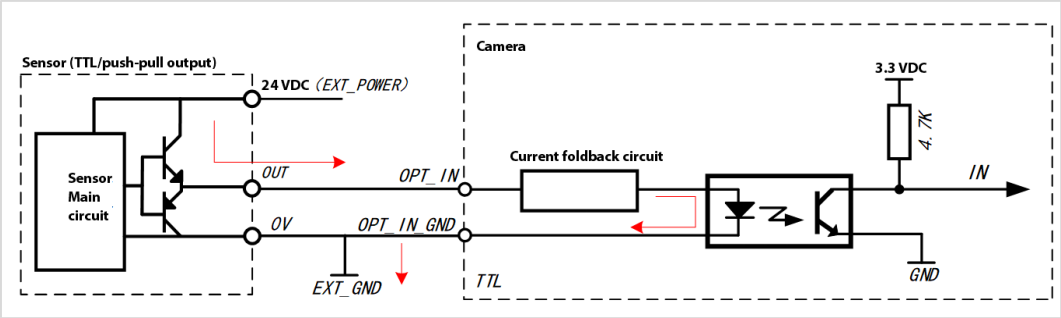


Figure 2-16 TTL/push-pull wiring method

2.3.2 Opto-isolated Output

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

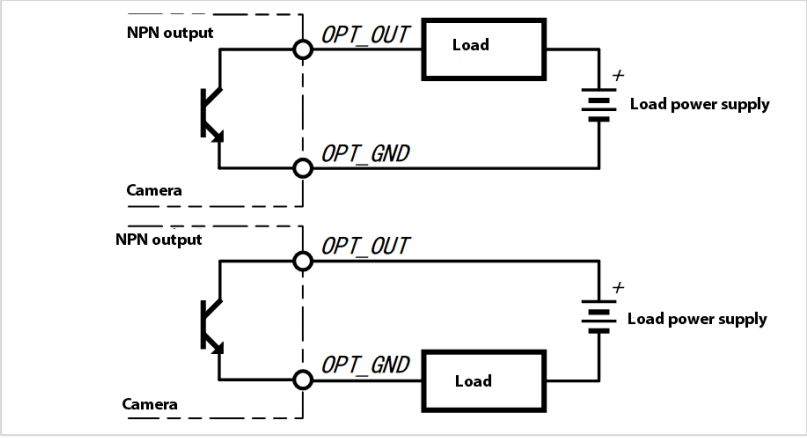


Figure 2-17 Opto output topology

2.3.2.2 Code Reader as NPN Output

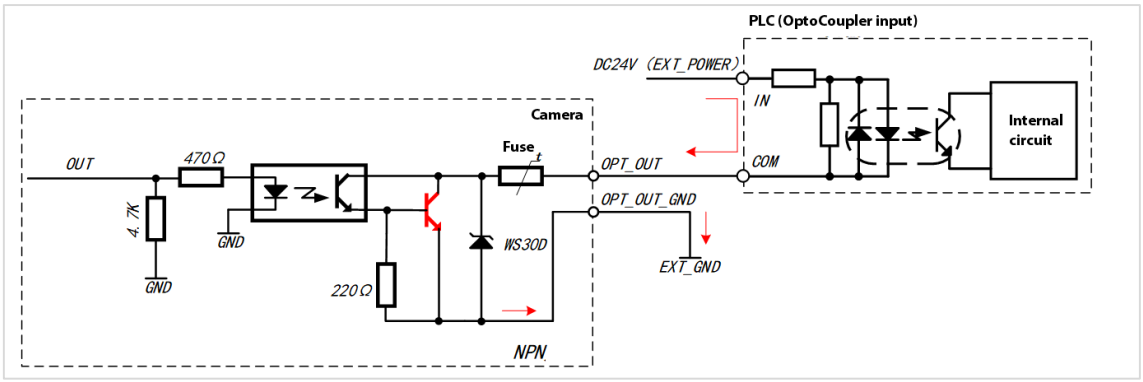


Figure 2-18 NPN output wiring method

2.3.2.3 Code Reader as PNP Output Wiring Method

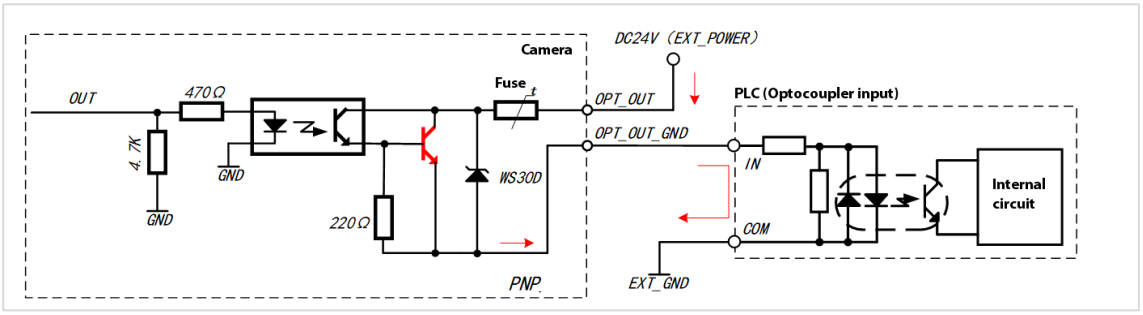


Figure 2-19 PNP output wiring method

2.3.3 GPI0

2.3.3.1 GPI0 is Used as an Input Port

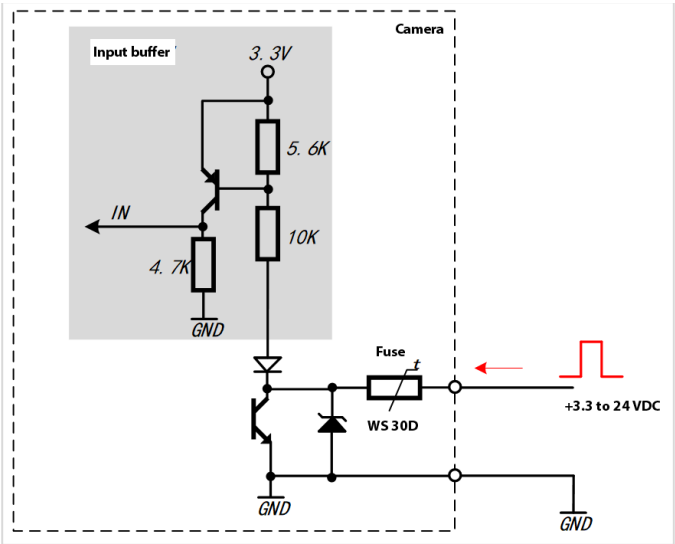


Figure 2-20 GPI0 input wiring method

2.3.3.2 GPIO is used as an output port

When GPI0 is used as output, it is similar to opto coupler output. The main difference is that GPI0 is connected in non-isolated mode and the GPI0 signal ground is in common with the camera power supply ground.

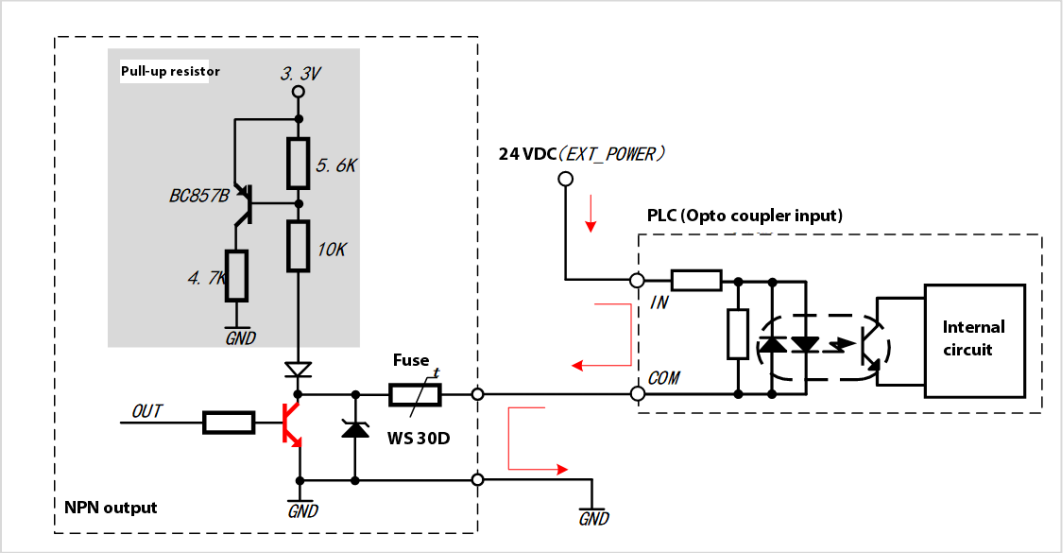


Figure 2-21 GPI0 output wiring method

- Please do not apply voltage that exceeds the maximum switching capacity to the output terminal or connect a load.
- The port fuse is not a user-replaceable part. If the fuse is blown due to overcurrent such as short circuit, please contact the after-sales service.
- GPIO is a bidirectional port that must be set in the correct direction (input or output) before a external circuit is connected. Do not change the direction setting during the operation of the camera. Incorrect direction setting will damage the GPIO port circuit.
- The GPIO port is non-isolated and has poor anti-interference performance. Please do not use it in a place with serious electrical interference. You are advised to preferentially use optically-isolated input-output ports.
- The recommended resistor for the opto coupler is 1 kΩ at 3.3 V, 1 kΩ at 5 V, 2.4 kΩ at 12 V, and 4.7 kΩ at 24 V. When the output current capacity needs to be improved, the resistor can be selected below 1kΩ, but the rated power should be used above 1W.

2.3.3.3 Inductive Load Wiring Method for Relays

If the output of the camera is connected to an inductive load such as a relay, the model with a built-in fly-wheel diode must be used (or an external fly-wheel diode); otherwise, this may lead to the damage of the output port due to instantaneous overvoltage.

The following image shows an example of a DC inductive load suppressor circuit. For most applications, an additional diode A is enough, but for applications requiring rapid make-and-break, a voltage-regulator diode is recommended. Ensure that a voltage-regulator diode can meet the current requirements of the output circuit.

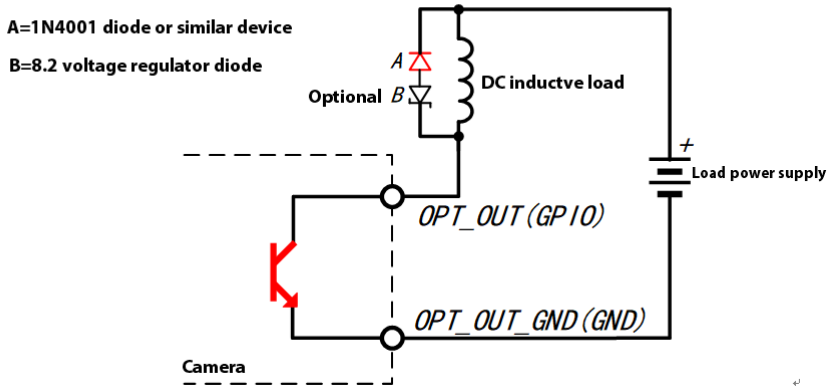


Figure 2-22 **Inductive load wiring method**

2.4 Avoid EMI and ESD

Cameras are installed in industrial sites where equipment that generates EMI (electromagnetic interference) may exist, and are themselves susceptible to ESD (electrostatic discharge). Serious EMI and ESD can lead to false triggering or sudden stop of current sampling. EMI and ESD can also adversely affect image quality of cameras and the reliability of data transmission between camera and PC.

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

- Use high quality shielded cables, which can play a good effect on shielding EMI and ESD;
- Choose a cable with right length. Do not coil the excessive camera cable into a loop. If the cable is really excessively long, bend it back and forth instead of coiling into a loop.
- The power cord of the camera is routed in parallel with data cable;
- Do not route the camera cable in parallel with other high current and voltage switching cables (such as stepper motor drive and solenoid valve); Do not place the camera cable near the interference sources mentioned above;
- You are advised to connect all the grounding (GND) wires to a single point, i.e. single point grounding. For example, a distribution board can be used to connect the grounding wires of the whole system to a single point. This is done to avoid plenty of ground circuits (which are a major cause of EMI problems).
- Use a line filter for the main power supply of the camera, or use a separate power supply;
- Install the camera and cables as far away from spark generating equipment as possible, such as brush motor and relay. A metal shielding enclosure can be additionally used if necessary;
- The following measures can be taken to reduce the risk of ESD:
    - ◇ The mounting surface is made of conductive material;
    - ◇ The humidity in the installation environment is properly controlled. Dry air is easy to produce ESD.

3 Installation

3.1 Installation Precautions

When installing, pay attention to static electricity, electromagnetic interference, lightning strike and surge as well as heat dissipation of the cameras.

3.1.1 Safety Protection Conditions

Although the interior of the camera is designed to protect against lightning, surge, EMI and ESD, from the perspective of safety, it is necessary to avoid or reduce these effects from the installation environment and installation method.

The following is the basic protection method, the user needs to refer to and adopt.

- Use shielded network cables in SSTP mode. When meeting the requirements of use, there are no requirements for the network cable, because in order to achieve good softness, the thickness of copper wire, shielding aluminum foil thickness, shielding net density, PVC outer protective performance and other aspects are not good enough.
- The network cable should be as short as possible If the cable is too long and has too much left over, use a snake pattern of wiring instead of winding the cable. This reduces the coupling of electromagnetic interference.
- The power control wire can be used with a shielded wire, and it should avoid winding. Power cables and network cables can wire in parallel. Do not intertwine.
- Power cables and network cables should be kept away from devices with high current, high voltage and frequent on-off and stop-start, such as stepper motors. In particular, do not wiring with such devices in parallel. These devices have strong electromagnetic radiation that is easily coupled to the camera's transmission line.
- The protective ground of all devices should be connected together and connected to the protective ground at a single point to avoid multiple grounding points. Multipoint grounding tends to cause voltage differences between devices and form a loop, which is prone to electromagnetic interference coupling.
- The AC power supply terminal of the switch power supply for the camera and that of the PC must come from the same AC bar. In this way, their protection ground can be connected together to avoid multi-point grounding. Do not directly use this AC power source for high-power mechanical and electrical equipment.
- Add a magnetic ring to the camera's power control line to absorb electromagnetic interference signals.
- Ensure a certain humidity. You need to wear an ESD bracelet, ESD clothes and shoes to reduce ESD damage.

3.1.2 Heat Dissipation Requirements

Environmental Requirements.

- Temperature and humidity.
  - ◇ The ambient temperature cannot exceed 50 °C, and it is best to for the Reader to work in an air-conditioned environment.
  - ◇ The ambient humidity when the camera is working: 20%–80%, non-condensing.
  - ◇ Storage temperature: –40 °C to +80 °C (–40 °F to +185 °F)
  - ◇ Storage humidity: 20%–80%. non-condensing.
- Do not coil the excessive camera cable into a loop. If the cable is really excessively long, bend it back and forth instead of coiling into a loop to ensure the performance of EMI.

- During transportation and assembly, it is necessary to pay attention not to bump the keys and prevent damage to the pot cover.

3.2 Hardware Installation

3.2.1 Packing List

After unpacking the box, check if there is obvious damage to the appearance of the equipment, and make sure the components are complete against the packing list.

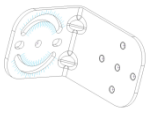
Table 3-1 Parts list.

No.	Name	Quantity	Remarks
1	Code Reader	1	—
2	M3×6 cross flat tail nickel plated screw	4	—
3	Focus wrench	1	Focusable models only

3.2.2 Installation

To ensure normal use of the device, make preparations for the related items listed in Table 1-3.

Table 3-2 Matching list

No	Name	Image	Quantity	Description
1	Code Reader	—	1	Device mentioned by this manual
2	Power I/O Interface Cable	—	1	Need to buy independently
3	Power adapter	—	1	Select an appropriate power adapter or switching power supply based on the power supply and power consumption of the device. For details, see the technical specifications of the corresponding device. You need to purchase them separately.
4	Install Bracket	—	1	Figure 3-1 and 3-2 show the installation effect. You need to purchase the device separately.
5	Switching bracket		1	Used for fixing equipment, combined with a fixed bracket can realize the multi-angle adjustment of the reader fixed way. You need to purchase them seperately.

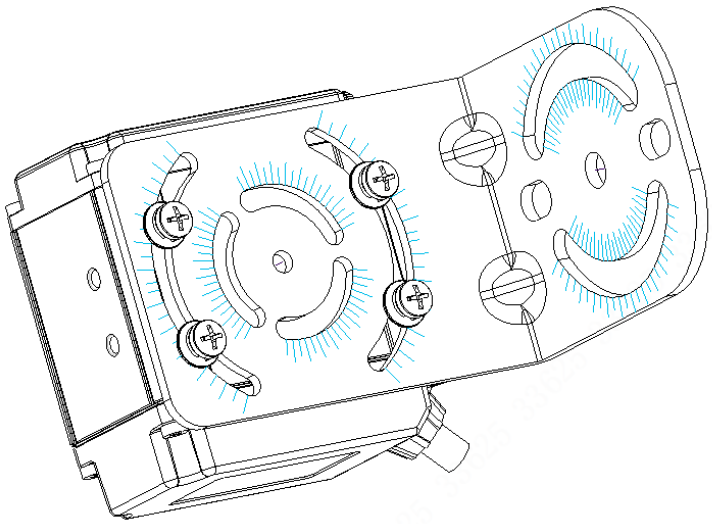


Figure 3-1 **Back Installation**

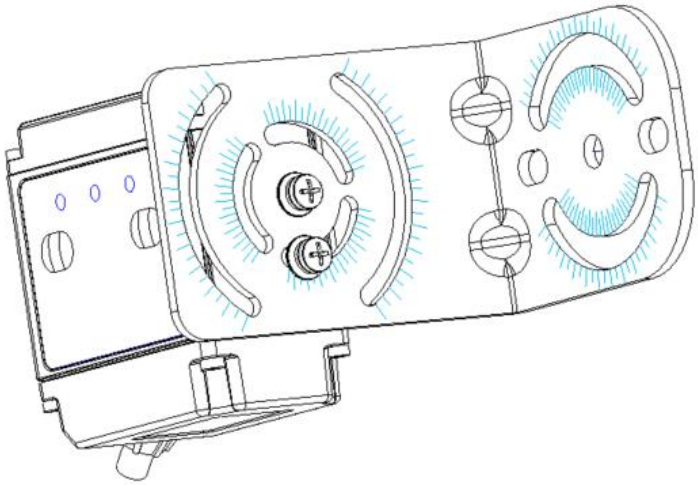


Figure 3-2 **Side Installation**

3.3 Network Settings

Step 1 Select Control Panel > Network and Internet > Network and Sharing Center > Change Adapter Settings.

Step 2 Select the corresponding network port and right-click **Properties** from the shortcut menu.

A dialog box is displayed.

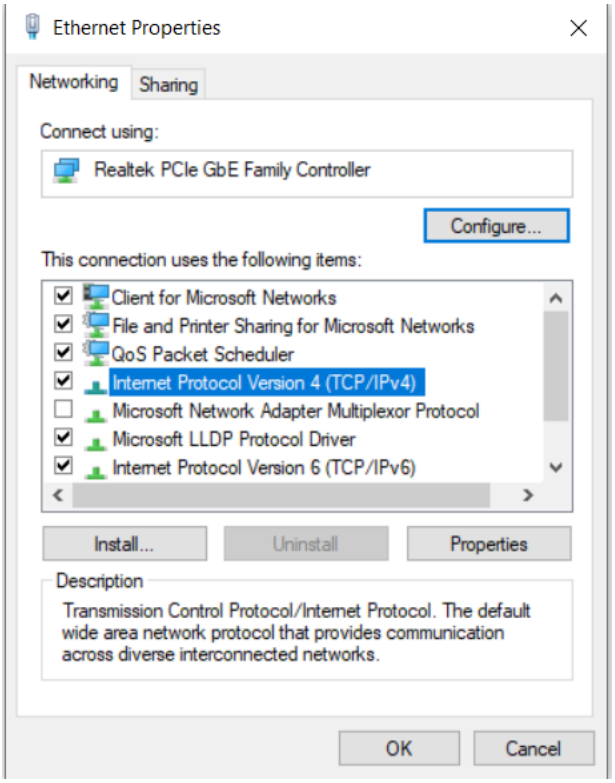


Figure 3-3 Attribute settings of NIC

Step 3 Double-click IPv4 in the red box in the figure.

The IP address setting page is displayed.

Step 4 Configure the network port to automatically obtain an IP address or a static IP address.

- Ensure that the PC and the device are on the same LAN.
- Make sure that PC and the device are on the same network (LAN).

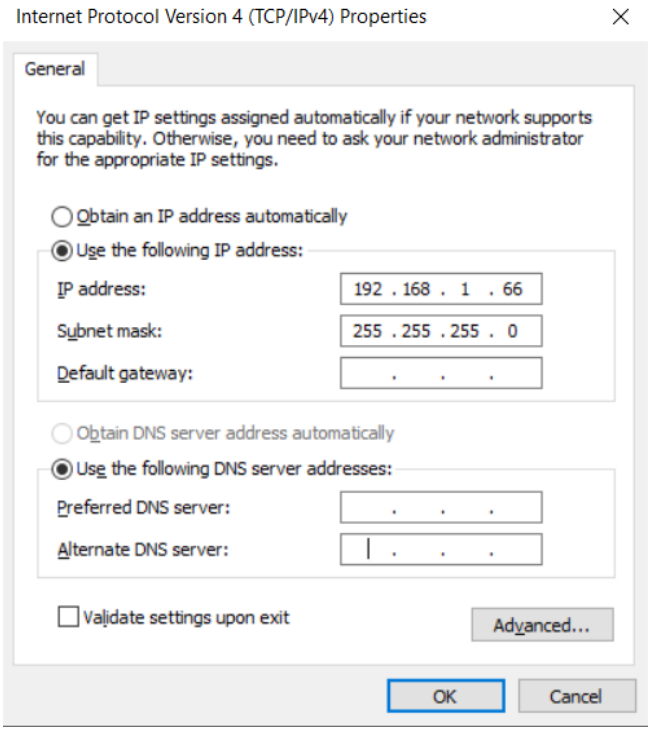


Figure 3-4 Windows NIC Settings

4 Frequently Asked Questions

4.1 The application cannot detect the camera device.

Possible reasons:

- ✧ Camera failed to start properly. The power supply does not meet the product requirements.
- ✧ Network Cable connection Exception.
- ✧ The camera and the client are not on the same Local Area Network (LAN).
- ✧ Is it a non-standard Protocol camera?

Solution:

- ✧ Check Power Supply: Make sure to use the appropriate power supply and wire.
- ✧ Check network connection: Check if the indicator lights of the code reader are normal, and ensure that the camera and client are on the same local network.

4.2 The application can detect the camera device, but the connection fails.

Possible reasons:

- ✧ Camera failed to start properly.
- ✧ The camera and the client are not in the same network segment.
- ✧ Other clients have already connected to this camera.

Solution:

Restart the camera and try changing the IP to match the client on the same network segment; or disconnect other connected clients and connect to this client.

4.3 Camera disconnected

Possible reasons:

- ✧ Hardware issues, such as a faulty Network Adapter or Network Cable.
- ✧ Software settings, such as Network Adapter settings and camera settings, do not match.

Solution:

- ✧ Cross Check the hardware and replace any defective components.
- ✧ Check Network Adapter settings.

4.4 The algorithm did not achieve the expected results.

Possible reasons:

- ✧ Image Field of view or lighting does not meet the requirements.
- ✧ Algorithm not enabled or Parameter settings are not reasonable.
- ✧ Is there any defect in the code itself?

Solution:

- ✧ Check the Image Field of View or lighting-related solutions; the main camera parameters include Trigger Mode, Trigger Delay, Enter Filtering, Exposure Gain, lighting parameters, etc.
- ✧ Check if Algorithm is enabled; Check Algorithm Parameters, especially the type, specification, timeout, quantity, filtering, Symbol Error Rate (SER), etc.

4.5 Unable to enable external trigger

Possible reasons:

- ✧ External trigger connection error.
- ✧ Trigger Mode is not selected for external triggering.

Solution:

- ✧ Choose the correct Trigger Mode and ensure that the external connections are correct.

5 Cleaning and Maintenance

This chapter mainly explains the cleaning and replacement of Color Filters.

We have installed a fully transparent Protective Glass on the Black & White camera to prevent dust from falling on the surface of the Image Sensor. The color camera is equipped with a low-pass Color Filter that can cut off near-infrared wavelengths. If the user has special requirements, such as not using a Color Filter or using a different transmittance curve Color Filter, they can replace the entire Filter holder outside the Image Sensor (without dismantling the casing) for replacement.

If there is dust on the surface of the Color Filter, we recommend using a specialized optical cleaning agent to clean it, which can effectively remove the dust without leaving any stains.