iLOX Series C
Smart Camera User Manual

V25.12. 2025

Preface

Purpose

This Manual is a basic description of iLOX series Smart Cameras, which mainly includes the product description, quick installation guide and Simple introduction of SDK(iLOGIX). This manual may be updated due to product upgrades or other reasons. If you need, please contact the sales engineer for the latest version of this manual.

Copyright ©2024
Hangzhou Vision Datum Technology Co., Ltd.
Tel.: +86 571-86888309
Add.:No. 8 Xiyuan 9th Road, West Lake District Hangzhou Zhejiang 310030 China.

Disclaimer

The information and specifications described in this manual are subject to change without notice.

Latest Manual Version

For the latest version of this manual, see the Download Center on our web site at: http://www.visiondatum.com/service/005001007.html

Technical Support

For technical support, e-mail: support@visiondatum.com.

Warranty

To ensure that your warranty remains in force, adhere to the following guidelines:

Do not remove the camera's serial number label
If the label is removed and the serial number can't be read from the camera's registers, the warranty is void.

Do not open the camera housing
Do not open the housing. Touching internal components may damage them.

Prevent ingress or insertion of foreign substances into the camera housing
Prevent liquid, flammable, or metallic substances from entering the camera housing. If operated with any foreign substances inside, the camera may fail or cause a fire.

Avoid electromagnetic fields
Do not operate the camera in the vicinity of strong electromagnetic fields. Avoid electrostatic charging.

Clean with care
Avoid cleaning the sensor if possible.

Handle this camera with care
Do not abuse the camera. Avoid striking, shaking, etc. The camera could be damaged by improper handling.

Read the manual
Read the manual carefully before using the camera.

1

PRODUCT DESCRIPTION

Product Introduction

With its ultra-compact design, this product can be easily installed in various confined spaces, breaking the limitations of deployment scenarios. Coupled with its flexible and convenient focusing method, it can accurately meet diverse application requirements such as short-distance detection.

In terms of operation and debugging, the product supports cross-platform web access and is equipped with a guided configuration process, which greatly reduces the difficulty of equipment debugging. Meanwhile, it has built-in easy-to-use algorithm tools that allow users to quickly implement core functions such as presence/absence detection, front-back identification, and dimension measurement without complex secondary development.

Widely used in numerous industries including PCB manufacturing, electronic products, automotive manufacturing, consumer goods, food and beverage, pharmaceuticals, and hardware, this product helps enterprises improve the precision of product quality control, reduce manual intervention, cut production costs through automated and intelligent means, and comprehensively enhance their market competitiveness.

Product Features

■ Ultra-compact design for seamless integration into confined installation spaces

■ Built-in user-friendly algorithms

■ Cross-platform web access with a guided configuration process

■ Flexible manual focusing to handle various short-distance application scenarios

■ Rich I/O interfaces including Ethernet, RS232 and GPIO, supporting multiple communication protocols

■ Gigabit Ethernet interface with IP65 protection rating

* The camera functions may differ by camera models,please refer to actual functions.

Status LED Description

Status LED	Description
LINK Indicator	Network indicator is solid green after the network is connected normally and flashing green when performing the data transmission.
POWER Indicator	It is solid when the power supply is normal; off when it is abnormal.
OK/NG Indicator	If the project is OK, the indicator is solid green; if the project is NG, the indicator is solid red.

Mechanical Dimensions

The dimensions is in millimeters:

The cameras are interfaced to an external circuity via 8-pin/12-pin connectors located on the housing and contain power, I/O, Ethernet, and serial signals. The interface is threaded. Tightening the interface during use can reduce the loosening of the interface caused by on-site vibration. There are three indicators on the top of the device that show the device status.

There are M4 screw holes on the back of the device for fixing the device.
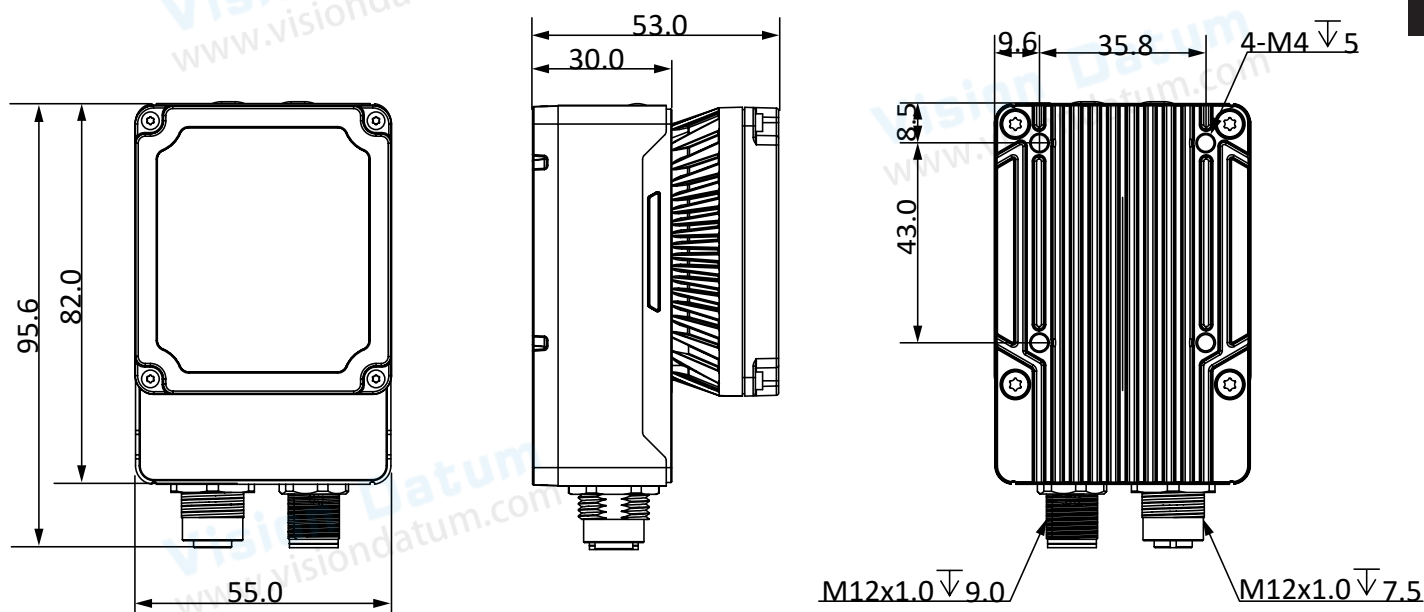
Camera Housing and Base Mounting Hole Size(mm):

Fig. 1-1: 55.0 x 82 x 53 Mechanical Dimensions (in mm) of the Smart Cameras (The installation uses M4 screws).

Figure	Model
Fig.1-1	iLOX-C

2

POWER AND
I/O INTERFACE DEFINITION

CHAPTER 2

I/O Connection Definition and Assignments

Different models of smart camera power supply and I/O interface correspond to different pin signal definitions.
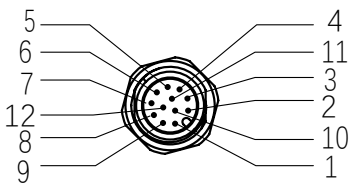

Table 2-1:
Numbering and assignments for 12-pin power, input/output, and serial port signal.

Color		Pin	Signal	Signal Source	Designation
Brown	White	1	OPT_OUT2	Opto-isolated output2	Scattered wire
Gray		2	RS232_TXD	RS-232 serial port for sending	DB9 female serial port
Purple		3	RS232_RXD	RS-232 serial port for receiving	DB9 female serial port
Black	White	4	SIGNAL_GND	RS-232 serial port GND	DB9 female serial port
Yellow		5	OPT_IN1	Opto-isolated input1	Scattered wire
Purple	White	6	OPT_IN_GND	Opto-isolated GND	Scattered wire
Red		7	POWER	Power input	DC 5.5 female receptacle
Black		8	POWER_GND	Power supply ground	DC 5.5 female receptacle
Green		9	OPT_OUT_GND	Opto-isolated output GND	Scattered wire
Orange		10	OPT_IN0	Optocoupler input0	Scattered wire
Blue		11	OPT_OUT0	Optocoupler output0	Scattered wire
Brown		12	OPT_OUT1	Optocoupler output1	Scattered wire

i
● The ports of cable for supplying power connecting to pin 7 and pin 8 have been made into DC5.5 female receptacles, therefore no additional wiring is required.
● The pins of cable corresponding to the RS-232, such as Pin 2, Pin 3, and Pin 4, have been made into DB9 female receptacle; therefore, no additional wiring is required.
● Other pins of cable can be wired according to the actual demands.

The wire color of this user manual is the color of Vision Datum. If you use other manufacturers' cable color definitions may be different, random connection may cause the camera to burn out, please connect according to the I/O port type and pin definition or contact our technical staff for advise.

3

CHAPTER 3

ELECTRICAL FEATURE
AND WIRING

Power Supply and Network Ports

| Parameter	Description
Power Supply	DC +9V ~ +26V, ＜ 1% ripple, powered through 12-core M12 connector. 24AWG cable or thinner cable.
Data Output Ports	1,000 Mbps Ethernet
I/O Port	One RS-232 serial port (non-isolated) Two opto-isolated input ports (LINE0~LINE1) Three opto-isolated output ports (LINE2~LINE4)

ℹ️ The power supply must comply with SELV and LPS specifications.

I/O Electrical Feature

▆ Opto-isolated Input

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

The typical circuit diagram of the opto-isolated input port is as follows:
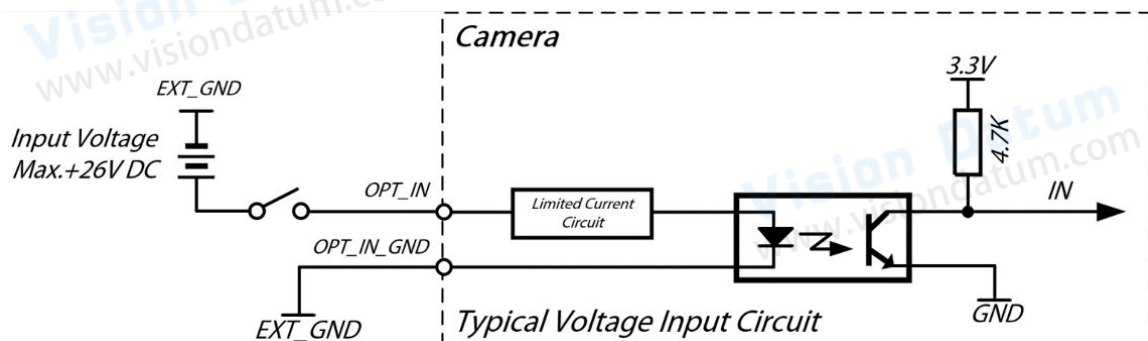
I/O Electrical Feature

The relationship between the sink current and input voltage of the opto-isolated input port is as follows.
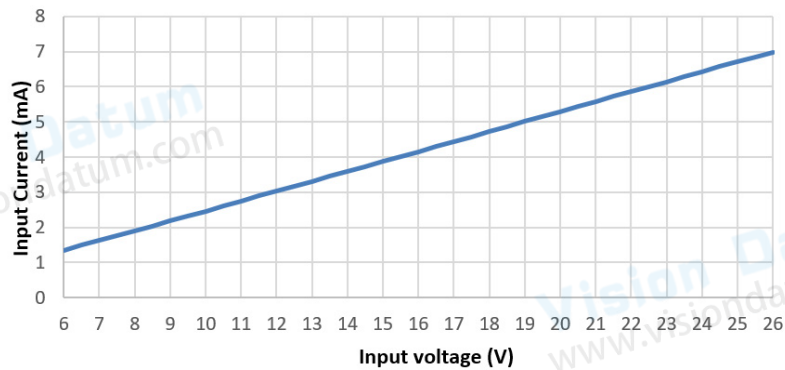
> ● The maximum input current of the opto-isolated input can be up to 7mA.
> ● Values in the line chart are obtained at an environmental temperature of 25° C (+77° F). Therefore, the actual values may vary among the different models of the camera in the different environments.

The relationship between the input signal amplitude and trigger delay is as follows.

Input Signal Amplitude (Vp-p)	Rising Edge Trigger Delay tDR（us）	Falling Edge Trigger Delay tDF（us）
9	18.8	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 time delay value from the external opto-isolated input port to the FPGA input pin, which means the internal logic delay of the FPGA is not included.

Minimum input pulse width of the trigger input signal is described in the table below：

| 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

I/O Electrical Feature

■ Opto-isolated Output

Voltage	Description
+26VDC	Limiting voltage. Input voltage must not exceed this limit. Otherwise, it may cause damages to the devices.
<+3.3VDC	Possible error on I/O output.
+3.3~+24VDC	Security working range of I/O output

The typical circuit diagram of the opto-isolated output is as follows.

Typical Voltage Output Circuit
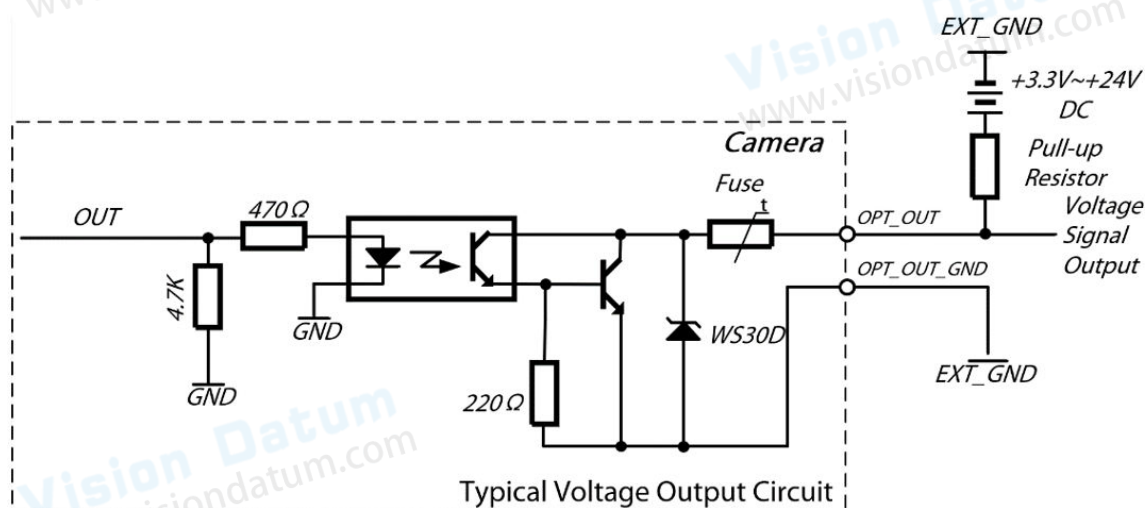
The rising/falling time and the rising/falling edge trigger delay time when using the 1 kΩ pull-up resistor are described in the table below.
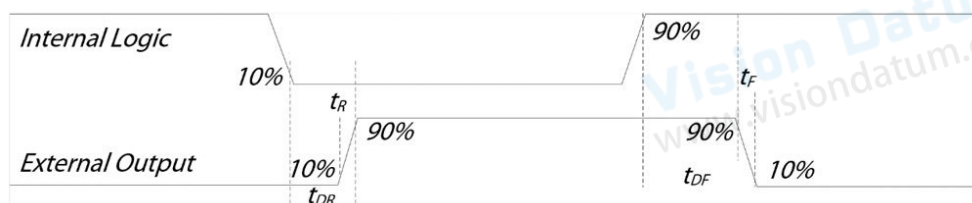
| External Power Voltage (V)	Rising Time tR (us)	Falling Time tF (us)	Rising Edge Trigger Delay tDR (us)	Falling Edge Trigger Delay tDF (us)
5	19.70	3.20	39.9	8.06
12	24.06	5.22	44.8	11.8
24	30.11	8.10	44.8	53.2

● The output delay measures the delay time value from FPGA internal logic output to the external opto-isolated output pin, which means the FPGA internal logic delay is not included.
● Values in the line chart are obtained at an environmental temperature of 25° C (+77° F). Therefore, the actual values may vary among the different models of camera in the different environments.

I/O Electrical Feature

The relationship between the output conducting voltage drop and output current is shown in the chart below.
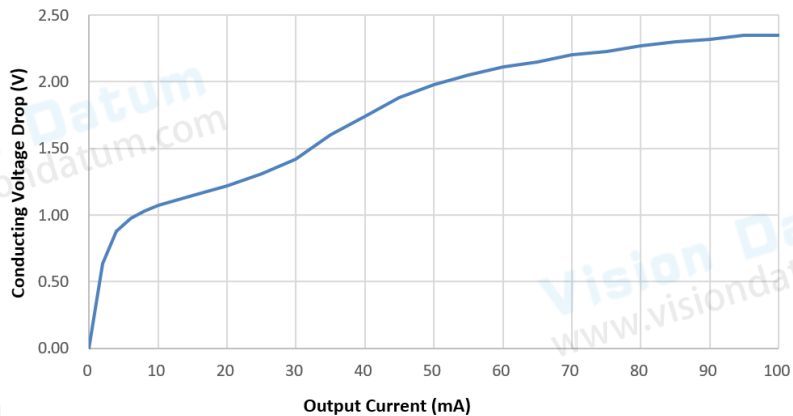
> ℹ️ ● The maximum conducting voltage drop at the opto-isolated output end is 2.35V. This result is obtained under the maximum output current 100mA.
> ● Values in the line chart are obtained at an environmental temperature of 25° C (+77° F). Therefore, the actual values may vary among the different models of camera in the different environments.
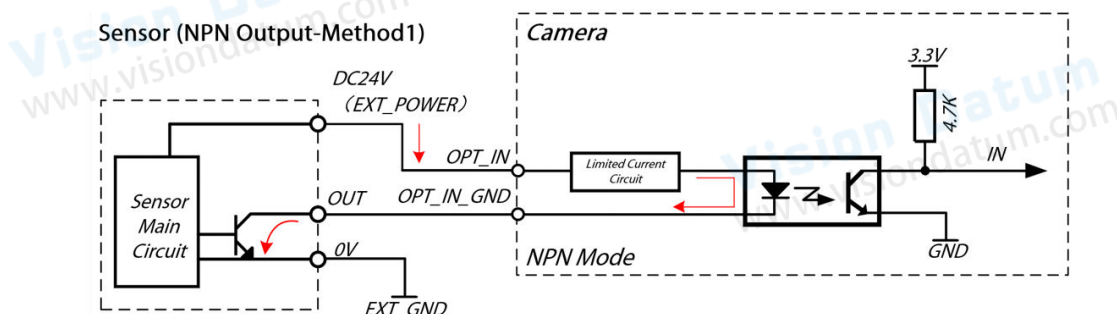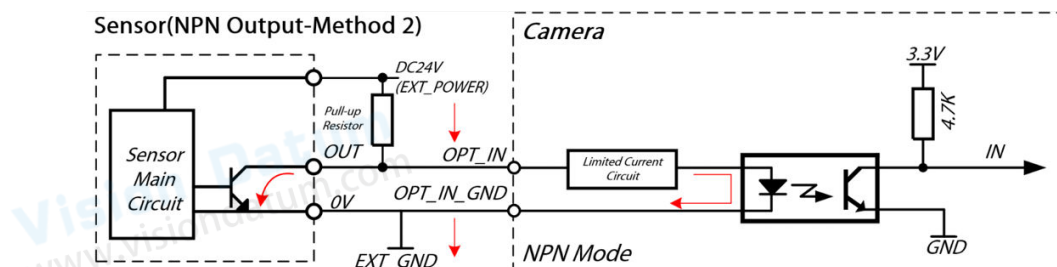
External I/O Wiring

■ Opto-isolated Input

The opto-isolated input can be used with the the cameras supporting the NPN, PNP, and push-pull output structures.

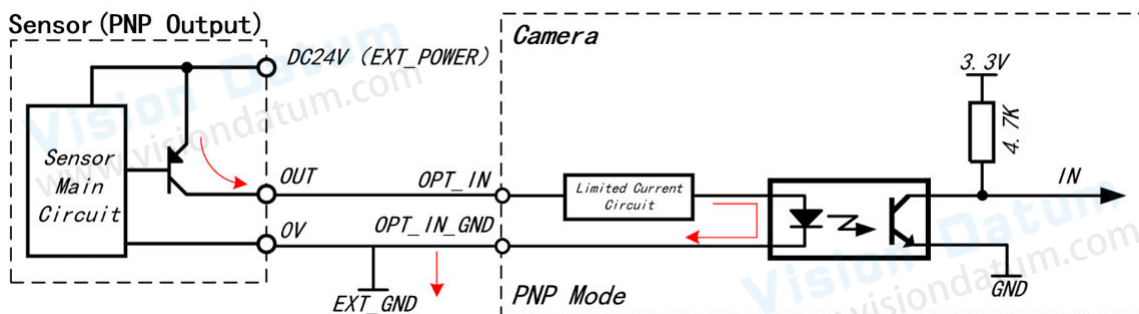### NPN Output Structure

● Method 1: No Pull-up Resistor (Recommend)

● Method 2: Add Pull-up Resistor

> ● "EXT_POWER" refers to the external positive port of power supply; "EXT_GND" refers to the external power grounding port. The power supply can be the independent switch-type power supply, and also can be of the sensor.
> ● This wiring method is suitable for the sensors with NPN open-collector output structure.
> ● If the external pull-up resistance is adopted, the voltage and pull-up resistance shall be 1kΩ at 3.3V, 1kΩ at 5V, 2.4kΩ at 12V, 4.7kΩ at 24V. If user needs to improve the current capacity, the pull-up resistor shall be less than 1kΩ, and the rated power of shall be more than 1W.
> ● In some models, the "OPT_IN_GND" and "OPT_OUT_GND" are integrated as one common port, namely "OPT_GND".

PNP Output Structure

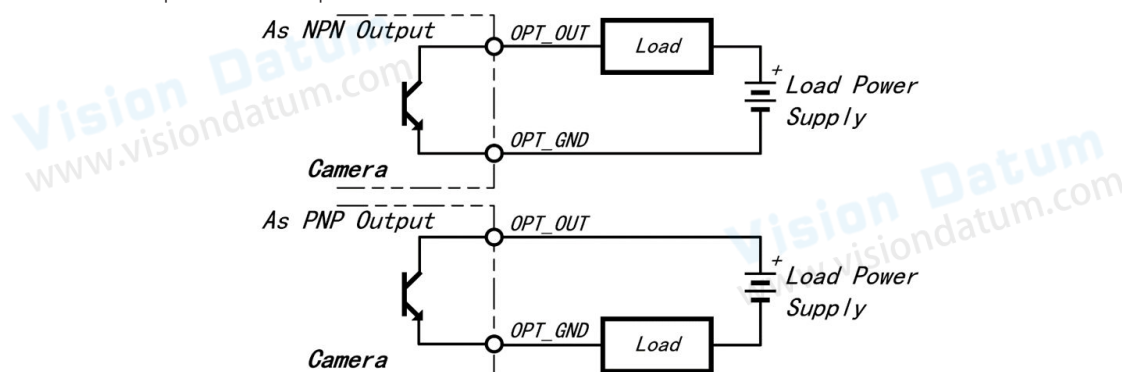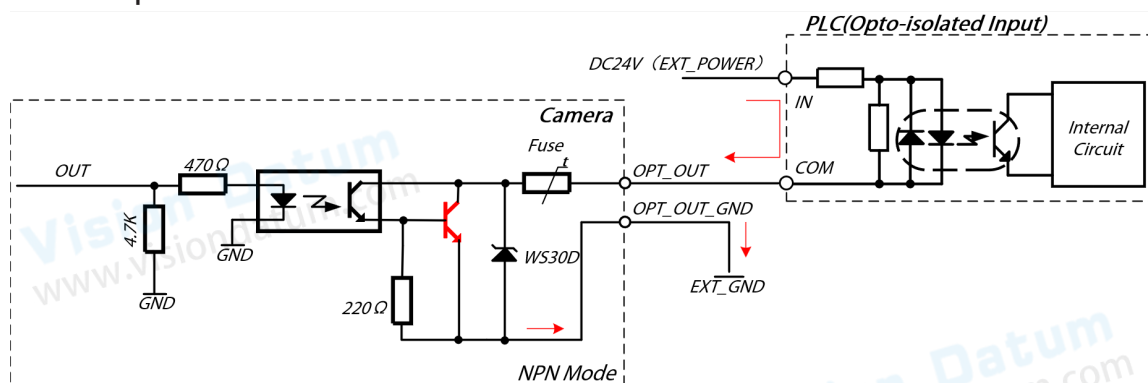### TTL or Push-pull Output Structure
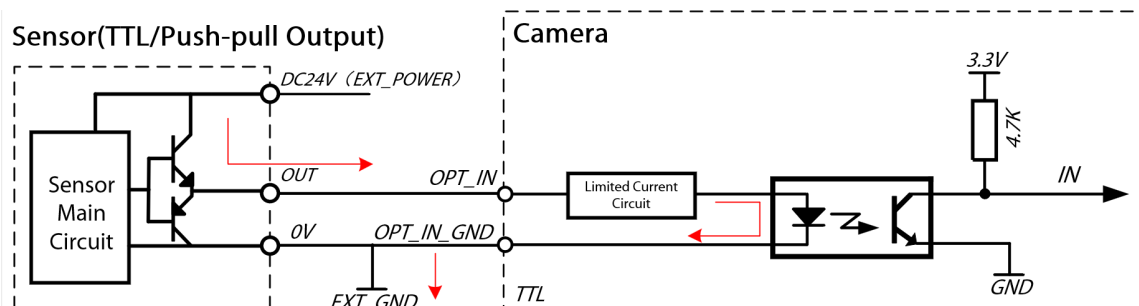
External I/O Wiring

■ Opto-isolated Output

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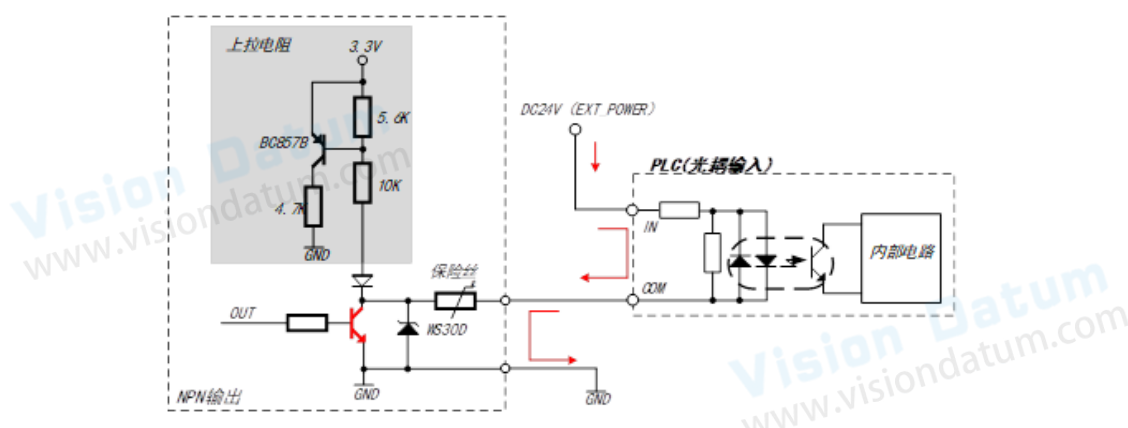

Camera as NPN Output

GPIO as Output Port

When the GPIO is as the output port, it is similar to the opto-isolated output, and the difference between them is that the GPIO output should adopt the non-isolated wiring method, and the signal grounding port of GPIO and sensor should connect to the common grounding port.


● Do not apply the voltage or connect load on the output terminals which exceeds the maximum value.
● Do not replace the fuse of the interface. If the fuse blows due to the overcurrent, such as short circuit, please contact our after-sales to provide the maintenance service.
● GPIO is the bidirectional port, and before connecting to the external power supply, please identify and set the correct the directions (output or input). Do not change the directions during the running of the sensor. The wrong settings of directions will cause damages to the circuit of the GPIO interface.
● Please do not use the GPIO output solution in the situation with serious electrical interference, because the GPIO is the non-isolated design which means its anti-inference performance is not good enough. We recommend you use the opto-isolated input port or output port.
● If the external pull-up resistance is adopted, the voltage and pull-up resistance shall be 1kΩ at 3.3V, 1kΩ at 5V, 2.4kΩ at 12V, 4.7kΩ at 24V. If user needs to improve the current output capacity, the resistance should be less than 1kΩ, and the rated power of it should be more than 1W.

External I/O Wiring

Wiring Method of Relay or Other Inductive Loads

To drive the inductive load, such as relay, using device output signals, please use relay with built-in flyback diodes,or use the external flyback diodes. Otherwise, the overvoltage will cause damages on the output interface.

The diagram below is an example of the suppression circuit of DC inductive load. In most solutions, one additional diode A is required. If you need the faster shutdown speed, we recommend you use the Zener diode B. Please ensure that the Zener diode can meet the current requirements of the circuit.
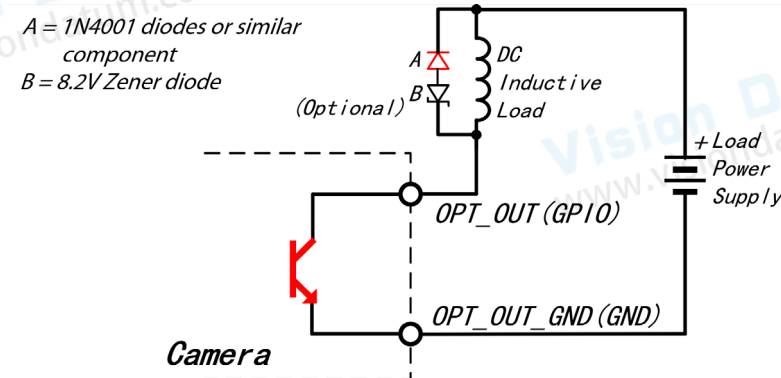
How to Avoid EMI and ESD

In the industrial environment, there are some equipment generating EMI, and the vision camera is apt to be influenced by ESD. Serious EMI and ESD can lead to false triggering or sudden stop of streaming. EMI and ESD will also bring instability to the image quality, and interfere the reliability of image transmission between camera and PC.

In order to avoid the problems mentioned above caused by EMI and ESD, we recommend you take the following measurements:

● Use high quality shielded cables, which can have a good effect on shielding EMI and ESD.

● Appropriate cable length is important. If the cable length is longer than expected, please fold the redundant part instead of looping it.

● Data transmission cable is suggested to be paralleled with the power cable.

● Camera cable should not be closely paralleled with other cables which has heavy current or has situations of voltage switching, such as stepper motor drive, solenoid valve.

● 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 a separate power supply for camera is recommended.

● Please keep camera and its cables away from the device generating sparks, such as brushed motors, relays, etc. A metal shielding shell is recommended if it is necessary.

● The following measurements can be taken to reduce the risk of ESD:

•   The mounting surface shall be adopted with conductive material.

•   The humidity in the installation environment shall be properly controlled. Dry air is easy to produce ESD.

4

CHAPTER 4 INSTALLATION AND SETUP

When installing the devices, please avoid the situations which can generate the static electricity, electromagnetic interference, lightning strike, or surge. Also, the device needs the sufficient space to dissipate the heat.

Software Installation

■ iLOGIX Installation

If you use a firewall on your computer, disable the firewall for the network adapter to which your camera is connected.

Close the Firewall
In order to ensure the camera software keep running and image transmission stability, please close the firewall before using the software.

System Requirements
To ensure that the normal operation of the client, the requirements to the PC are as follows.

Recommend Configuration
● Operating System： 64-bit Windows 10 or above
● CPU： Intel i5-10500
● Memory： 8GB or above
● Graphics Card： 1440*900 or above
● NIC： GigE

Standard Configuration：
● Operating System： 64-bit Windows 10 or above
● CPU： Intel E3940
● Memory： 4GB
● Graphics Card： 1440*900 or above
● NIC： GigE

Installation Steps

1.You can download the iLOGIX software from：

http://www.visiondatum.com/service/005001008.html

2.Double click iLOGIX installation package to install the client.

3.Follow the instructions on the screen. The installer will guide you through the installation process.

Hardware Installation

■ Camera Installation

The installation procedures assume that you will be making a peer-to-peer connection between your camera and a computer.

Make sure that the following items are available before starting the installation:

■ iLOGIX Series Smart camera

■ Applicable switch or network card

■ The computer with a GigE network adapter installed

■ The computer must be equipped with appropriate operating system

■ Standard Ethernet cable (CA5 or above).

Steps：

■ Use M4 screws to fix the device to the installation position.

■ Use the supplied 12-pin cable to wire the device to a suitable power adapter or switch power supply.

■ Connect the device to a switch or NIC via network cable.

Network Settings

Before using the camera, you need to configure IP is in the same network segment with the computer. You can modify it in"Local Connection" to ensure network communication is normal.

Local Network Configuration :

● Select Control Panel > Network and Internet > Network and Sharing Center >Change Adapter Configuration. Select the corresponding network port and right-click Properties from the shortcut menu. A dialog box is displayed.

● Double-click Internet Protocol Version 4 (TCP/IPv4). The IP address setting interface will be popped up. Configure the network port to the static IP address: 192.168.1.X, Ensure that the PC and the device are on the same LAN.

● Open "Advanced" in the properties, set Speed and Duplex as Auto-Negotiation or 100 Mbps.Shown as below:
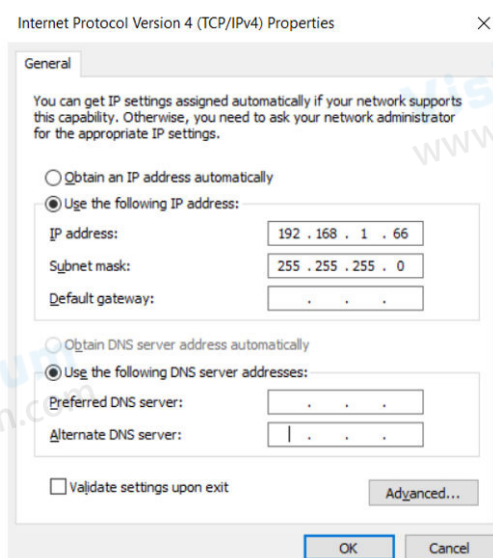
Software Operation

The client supports the web version. After connecting the device, the user can perform the project management on the client software. The wizard-type guideline can walk the user through configuring the project. The main steps include Shooting Setup, Master Registration, Algorithm Setup, Communication Setup. Also supports the functions of device management and monitoring, and the web version is integrated in the client software; therefore, the user does not need to install the additional software.

■ Client

Please refer to the document Getting Started with iLOGIX for details.

■ Web Client

● Compatibility Requirement

The following browsers are highly recommended.
- ● Google Chrome: Version 127.0 or later.
- ● FireFox: Version 116.0 or later.
- ● Edge: Version 95.0 or later.

● Web Client Operation

Procedure

Step 1 Enter the IP address of the camera in the browser, and press 【Enter】 to enter the web client. After entering the web client, enter the username and password to login the configuration interface. If user forgets the password of the camera, please refer to the Password Reset.

Step 2 The functions and operations of the web client and desktop client are the same. The function introduction and operation guidance, please refer to the document Getting Started with iLOGIX for details.

	● The default IP address of camera is 192.168.1.108. Before using the web client, user shall configure the IP address of the PC to make it in the same network segment with the camera; otherwise, user cannot login the web client. ● User does not need to install any plug-ins on the browser.

5

CHAPTER 5   FAQ

Trouble Shooting

Trouble:

■ Client Cannot Find Camera

Possible Reason:
- Camera are not started normally, and the power supply cannot meet the requirements.
- Abnormal network cable connection.
- The camera and the client are not under the same network segment.
- Firewall forbidden the network access.
- IP Conflict: The IP address of camera conflicts with the PC's or other devices.

Solutions:
- Power Supply: Make sure that the power supply and cable are suitable.
- Network Connection: Check the indicator of the camera, and make sure the network connection is normal. Also, make sure the device and client are on the same network segment.
- Disable the firewall, or add the client software into the allow-list.

■ Camera Disconnection

Possible Reason:
- Hardware problems, such as poor contact of network card and network cable.
- Unmatched configurations of network adapter and camera.

Solutions:
- Perform cross verification for hardware, if failure happens, replace the corresponding hardware.
- Check the NIC configuration.

■ Algorithm Processing Does Not Meet Expectations

Possible Reason:
- Image FOV or illumination does not meet the requirements.
- Improper parameter configurations.

Solutions:
- Check the parameters of camera FoV and the illumination. Review the camera parameters, such astrigger mode, trigger delay, exposure and gain, illumination, etc.
- Check the parameters of the algorithm, especially the ROI box, polarity, filtering conditions, etc.

■ External Trigger Cannot be Enabled

Possible Reason:
- Incorrect cable connection of external trigger.
- The trigger mode is not set to external trigger.

Solutions:
Select the required trigger mode and make sure that the external cable connection is correct.

■ Unable to Login the Web Client

Possible Reason:
- The IP address of the camera was not defined which means it is the private IP address.
- IP address of the camera was changed.

Solutions:
Use client to find camera and check its IP address, and then use the correct IP address to log in the web client.

CHAPTER 6 **TECHNICAL SUPPORT**

Technical Support

If you need advice about your camera or if you need assistance troubleshooting a problem with your camera, it's highly recommended to describe your issue in details and contact us via E-mail at support@visiondatum.com

It would be helpful if you can fill-in the following table and send to us before you contact our technical support team.

Camera Model:		Camera's SN:	
Describe the issue in as much detail as possible:			
If known, what's the cause of the issue?			
How often did/does the issue occur?			
How severe is the issue?			
Parameter set	Please connect the camera directly to PC and make note of the parameter when the issue occurred.		

Hangzhou Vision Datum Technology Co., Ltd

No.8 Xiyuan 9th Road, West Lake District Hangzhou Zhejiang 310030 China
Tel: 86-571-86888309
www.visiondatum.com