



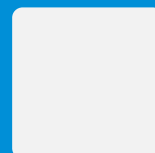
Guangdong Hinson Technology Co., Ltd



Optical data transmission

OPS Series Manual

www.hinson-xs.com



Thank you for using our products. This manual explains the usage and safety precautions of the products.

- ◆ Please read this manual carefully and pay attention to safety during use.
- ◆ Please keep this manual in a suitable place for easy reference.

Applicable release notes

Version	Add or subtract information
V1.0	Published
V1.1	Increase laser level

Optical data transmission (OPS)					
Parameters/ Model	Effective transmission distance	Transmitting optical frequency	Communication method	Wire	Customer customization requirements
OPS	A8=0.8m 02=2m 05=5m 10=10m 30=30m	78=780nm:F2 85=850nm:F4	0、Ethernet	01: 1.0m 20: 2.0m 50: 5.0m A0: 10m A5: 10.5m B0: 11m B5: 11.5m C0: 12m C5: 12.5m	00: Standard Edition

1 Safety Precautions	1
1.1 Attention to applicable environment	1
1.2 Pay attention to the wiring environment	1
1.3 Note on debugging environment	1
2 Function Introduction	2
2.1 Features	2
2.2 Function	4
3 Preparation	5
3.1 packing list	5
3.2 Debugging Tools	5
4 Installation	6
4.1 Size parameters	6
4.2 Layout Description	6
4.3 Indicator Light Description	7
4.4 Installation Steps	8
4.5 Installation Requirements	10
4.6 Debugging confirmation	10
4.7 Movable range curve	11
4.7.1 0.8 meter series	11
4.7.2 2 meters series	12
4.7.3 5 meters series	13
4.7.4 10 meters series	14
4.7.5 30 meters series	15
4.8 Acceptance Angle Curve	16
4.8.1 0.8 meter series	16
5 Cable Definition	18
5.1 Ports and conveyor lines	18
5.2 Input and output signal connection	20
5.2.1 Input signal connection	20
5.2.2 Output signal wiring	21
6 Host computer connection (optional)	22
6.1 illustrate	22
6.2 RS232 Host computer debugging	22
6.2.1 Preparation for Debugging	22
6.2.2 Software Preparation	22
6.2.3 Hardware Preparation	22
6.2.4 Start debugging	23
6.2.5 Hinson Technology OPS host computer software serial port settings	23
6.2.6 software obtains parameters and draws signal strength curves	23
7 Troubleshooting	24
7.1 Fault Diagnosis	24
7.2 troubleshooting	24
8 After-sales information	25
8.1 Warranty period	25
8.2 Warranty scope	25
8.3 Disclaimer	25
8.4 Technical Support	25

1 Safety Precautions

1.1 ATTENTION TO APPLICABLE ENVIRONMENT



Visible particles in steam, smoke, dust and air may cause the sensor to misjudge or even become unusable;

Qualified technicians need to be regularly arranged to check whether the sensor is connected and installed correctly;

The maximum service life of the sensor is 10 years, after which it must be replaced, otherwise it may not meet the required performance requirements;

Sensors should be inspected and cleaned regularly;

This product is only allowed to be used within specified limits and specified technical parameters and operating conditions at any time.

1.2 PAY ATTENTION TO THE WIRING ENVIRONMENT



Do not connect the power supply reversely or connect it to a voltage higher than the specified maximum working voltage, otherwise the sensor will be damaged;

If the power supply is lower than the minimum working voltage, the sensor will not work or work abnormally;

Please follow the instructions in the manual for wiring, otherwise the sensor may not be able to detect the input signal correctly;

Do not connect the device to the output signal terminal to exceed the load capacity of the sensor, otherwise it will cause sensor failure.

1.3 NOTE ON DEBUGGING ENVIRONMENT



Only qualified and authorized personnel are allowed to connect, install, commission and set up sensors;

Confirm that the peripheral equipment associated with the sensor is in a reliable stop operation state;

Confirm that the debugger is in a safe position;

Confirm that other people or objects are outside the range of the device.

2 Function Introduction

2.1 FEATURES

Parameters /Model	OPS-027800100	OPS-028500100	OPS-057800100	OPS-058500100	OPS-107800100	OPS-108500100	OPS-307800100	OPS-308500100
Basic data								
Effective transmission distance	2m	2m	5m	5m	10m	10m	30m	30m
Light emission frequency	780nm: F2	850nm: F4	780nm: F2	850nm: F4	780nm: F2	850nm: F4	780nm: F2	850nm: F4
Communication interface	100M Ethernet							
Laser parameters								
Light source	Laser							
Laser level	Class3b							
Working range	0.1m~2m	0.1m~2m	0.1m~5m	0.1m~5m	0.1m~10m	0.1m~10m	0.1m~30m	0.1m~30m
Transmission frequency	780nm: F2	850nm: F4	780nm: F2	850nm: F4	780nm: F2	850nm: F4	780nm: F2	850nm: F4
Vertical divergence angle	±7.6°	±11.9°	±1.44°	±1.92°	±0.95°	±1.31°	±0.48°	±0.67°
Vertical receiving angle	±0.9°	±0.9°	-	-	-	-	-	-
Horizontal divergence angle	±13.6°	±17.0°	±3.12°	±3.6°	±2.02°	±2.26°	±0.95°	±1.19°
Horizontal receiving angle	±1.6°	±1.6°	-	-	-	-	-	-
Communication frequency	125M							
Debug duty cycle	8ns - 32ns							
Optical communication establishment time	Initial establishment time is less than 2.5s, and re-establishment time is less than 50ms							
Connection light source	850nm	780nm	850nm	780nm	850nm	780nm	850nm	780nm
Communication rate	100Mbps							
Communication protocol	No restrictions							
Electrical specifications								
Working voltage	DC10V~30V							
Rated power	2.04W							

Environmental conditions	
Ambient temperature for use	- 10℃-50℃, indoor use
Ambient humidity for use	< 80% RH
Ambient temperature for storage	-20℃-70℃
Ambient light	<80000lux

Mechanical/Electronic Parameters	
LED indicator light	PWR (green): power indicator light LINK (yellow): network connection light RSSI (red, yellow, green, green): signal light
Product size	70*42*74.5mm
Protection level	IP65
Shell material	Aluminum Alloy

Parameters /Model	OPS-A87800100	OPS-A88500100
-------------------	---------------	---------------

Basic data		
Effective transmission distance	0.8m	
Light emission frequency	780nm: F2	850nm: F4
Communication interface	100M Ethernet	

Laser parameters		
Light source	laser	
Laser level	Class3b	
Working range	0.1m~0.8m	
Transmission frequency	780nm: F2	850nm: F4
Vertical divergence angle	±7.6°	±11.9°
Vertical receiving angle	±4°（0.8m） ±7°（0.5m） ±9°（0.3m）	±3°（0.8m） ±6.5°（0.5m） ±8.5°（0.3m）
Horizontal divergence angle	±13.6°	±17.0°
Horizontal receiving	±4°（0.8m)	±4°（0.8m）

angle	±7° (0.5m) ±9° (0.3m)	±7° (0.5m) ±9° (0.3m)
Communication frequency	125M	
Duty cycle for debugging	8ns - 32ns	
Optical communication establishment time	Initial establishment time is less than 2.5s, and re-establishment time is less than 50ms	
Connection light source	850nm	780nm
Communication rate	100Mbps	
Communication protocol	No restrictions	

Electrical specifications

Working voltage	DC10V~30V
Rated power	2.04W

Environmental conditions

Ambient temperature for use	- 10℃-50℃ , Indoor use
Ambient humidity for use	< 80% RH
Ambient temperature for storage	-20℃-70℃
Ambient light	<80000lux

Mechanical/Electronic Parameters

LED indicator light	PWR (green): power indicator light LINK (yellow): network connection light RSSI (red, yellow, green, green): signal light
Product size	70*42*74.5mm
Protection level	IP65
Shell material	Aluminum Alloy

2.2 FUNCTION

The OPS series optical data transmitter has a very high communication rate, up to 100Mbps, and a communication distance of up to 30 meters. It can transmit data quickly and stably, and supports mainstream industrial control buses (Profinet, Ethercat, etc.); the time to quickly establish communication is less than 2.5s, and the time to re-establish communication after interruption is less than 50ms; and it does not limit the device connection, and can connect to any network device with a network cable, such as laser sensors, servo drives, PLCs, cameras, etc.

3 Preparation

3.1 PACKING LIST

*Please confirm whether the product name and model on the external label of the product packaging box are consistent with what you purchased;

*Determine the product name and model through the external label of the product;

*Please confirm whether the following items are complete after unpacking. If not, please contact our company;

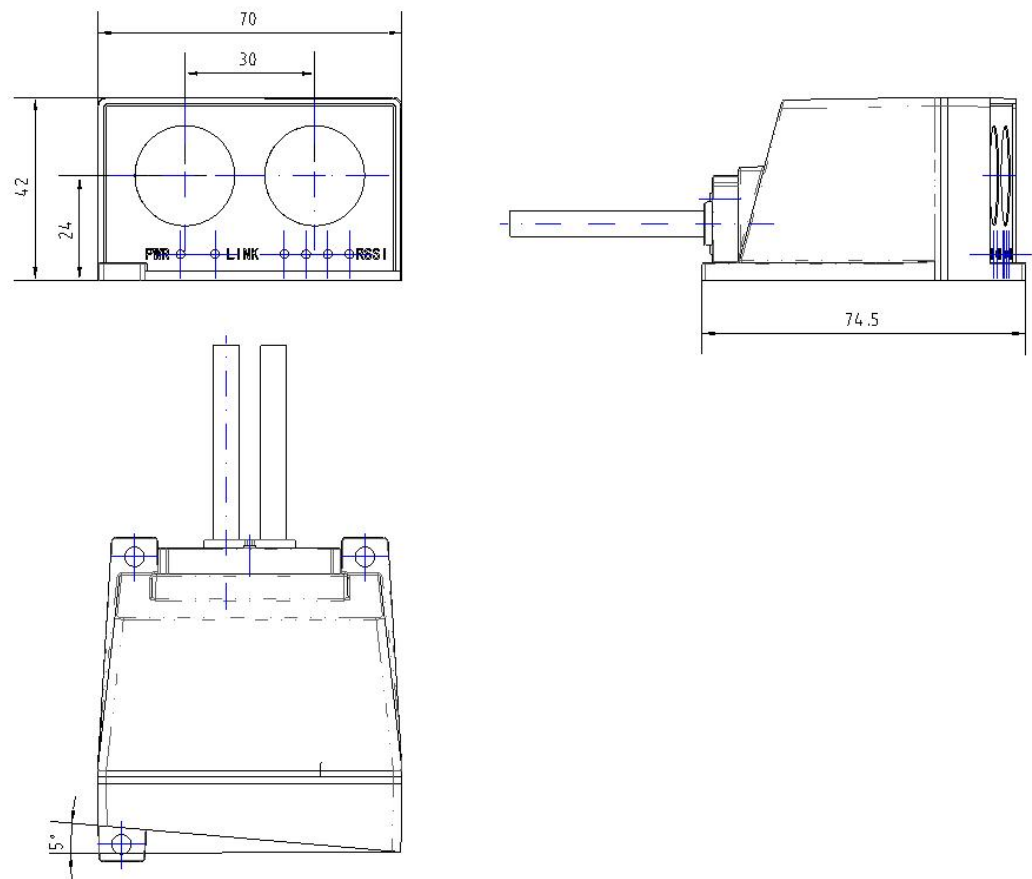
Packaging accessories		
1	Optical data transmitter	1
2	Hinson configuration software	1
3	Sensor certification	1
4	Hinson host computer software	1

3.2 DEBUGGING TOOLS

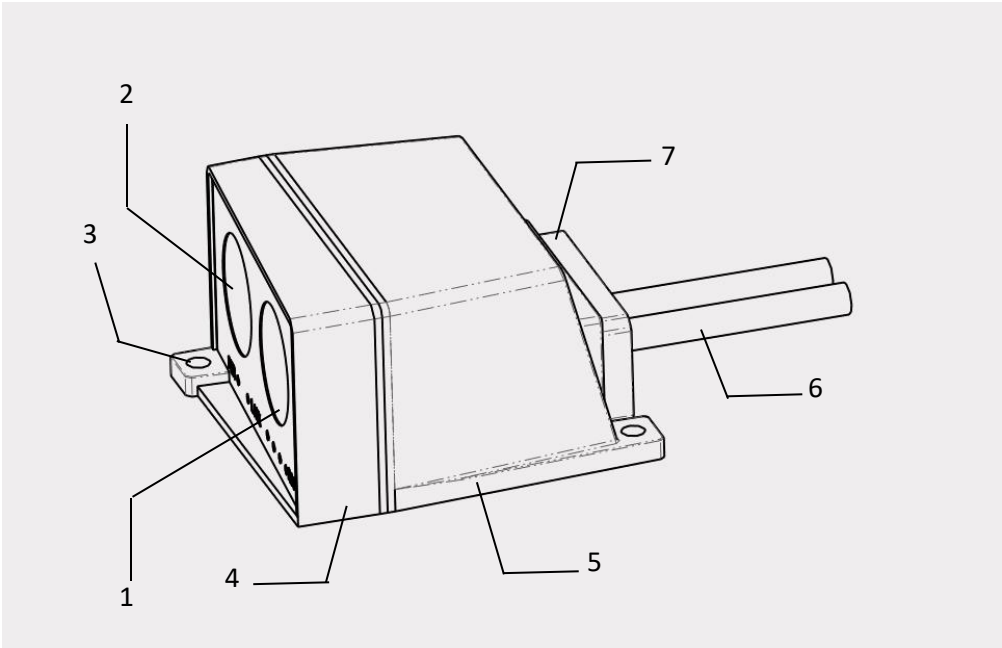
PC	Running Windows 7 and above	1
----	-----------------------------	---

4 Installation

4.1 SIZE PARAMETERS



4.2 LAYOUT DESCRIPTION



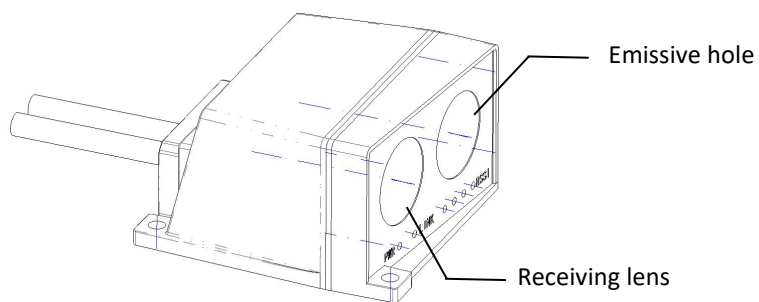
1	Transmitter hole
2	Receiver lens
3	Fix hole
4	Front shell
5	Rear shell
6	Wire end
7	Cable

4.3 INDICATOR LIGHT DESCRIPTION

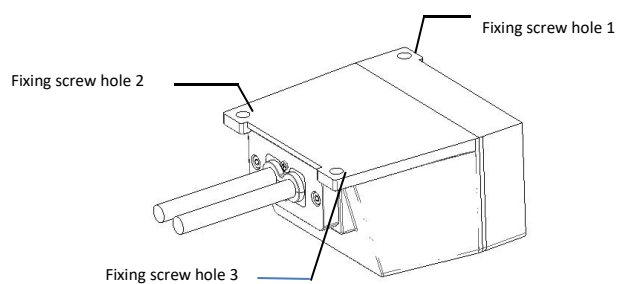


mark	Display	Operation Instructions
PWR	Green	Off: No power supply voltage Green-on: Power supply is normal
LINK	Yellow	Off: The network cable is not connected successfully. Green-on: The network cable is connected normally.
RSSI	1 red light 1 yellow light 2 green lights	RSSI is the signal strength received by this machine; Only the red light is always on: it means the signal strength is weak; The red and yellow lights are always on at the same time: it means the signal strength is medium; The red, yellow and green lights are always on: it means the signal strength is good; Off: it means no signal is received

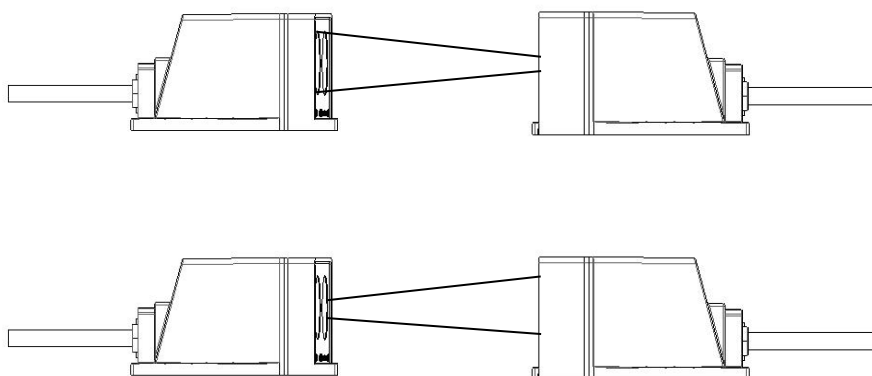
4.4 INSTALLATION STEPS



a、Wiring and power on



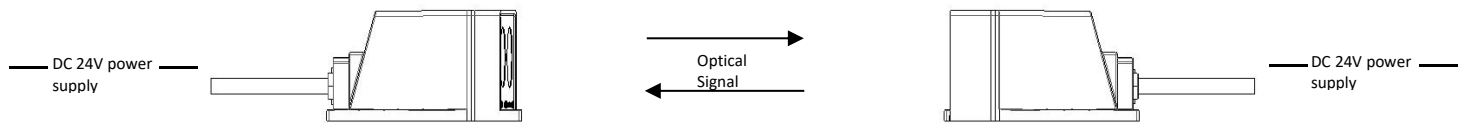
b、Fix the equipment according to the size and position of the screw holes;



c、The light source of the transmitting hole can be aligned with the receiving lens of the opposite module; the communication status can be confirmed at a close distance of 0.5 meters;



d、 Confirm the above light status; make sure the LINK and RSSI signal lights are all on;



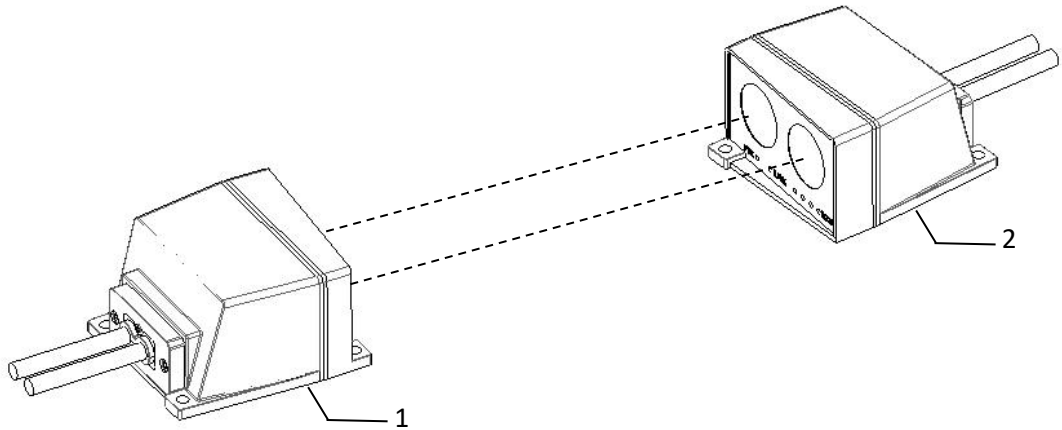
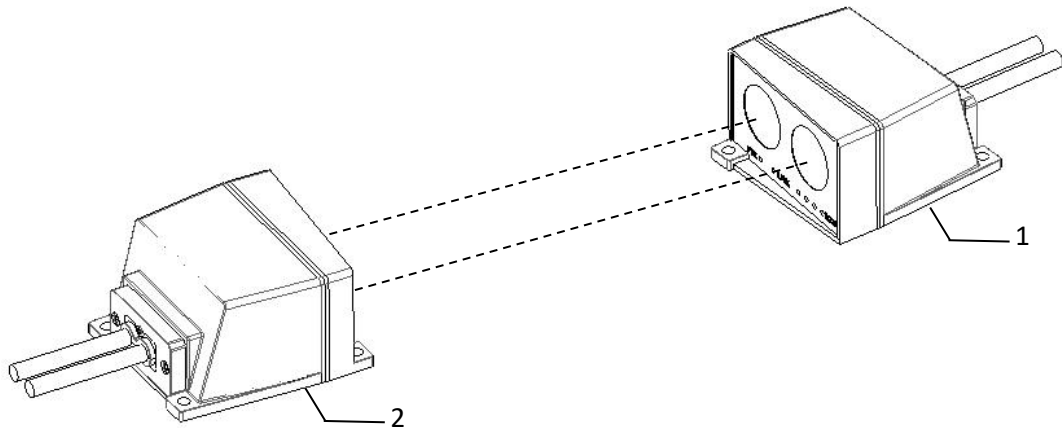
e、 Gradually increase the distance until the RSSI signal begins to weaken to the orange area, and then adjust the installation angle;



f、 The angle adjustment target is that the RSSI signal needs to reach the maximum signal strength at the current distance, and it does not necessarily have to be full.

4.5 INSTALLATION REQUIREMENTS

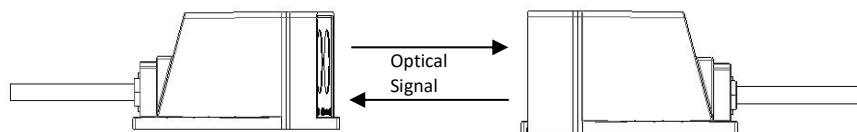
During installation, you need to ensure that the sending center of the device is aligned with the receiving center;



- 1: Model is OPS-3078000
- 2: Model is OPS-3085000

4.6 DEBUGGING CONFIRMATION

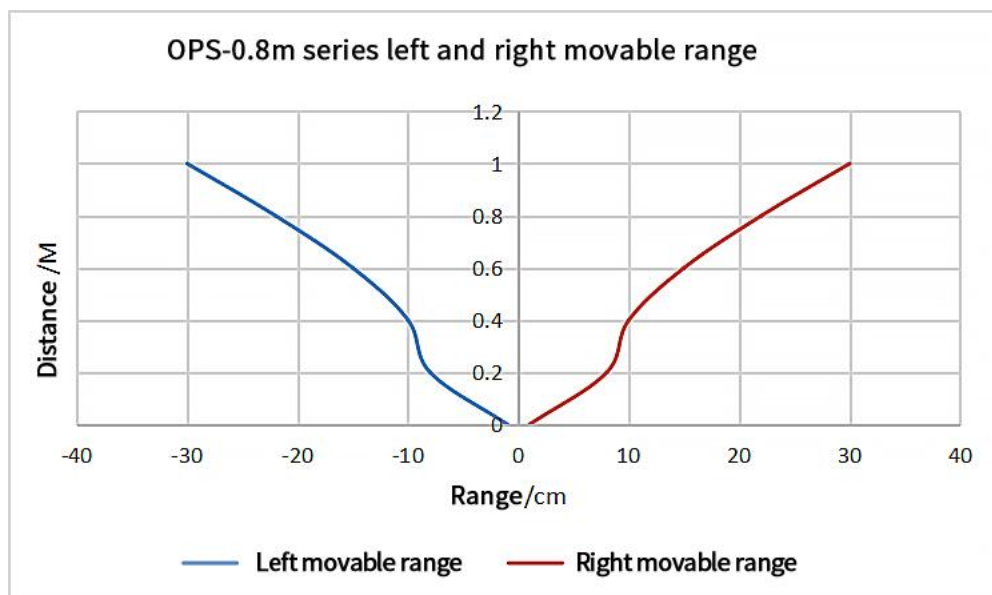
After completing the installation and docking, perform a network test
Link supported Ethernet devices according to the following diagram;



After the installation is complete, device 1 and device 2 can communicate directly over Ethernet;

4.7 MOVABLE RANGE CURVE

4.7.1 0.8 meter series

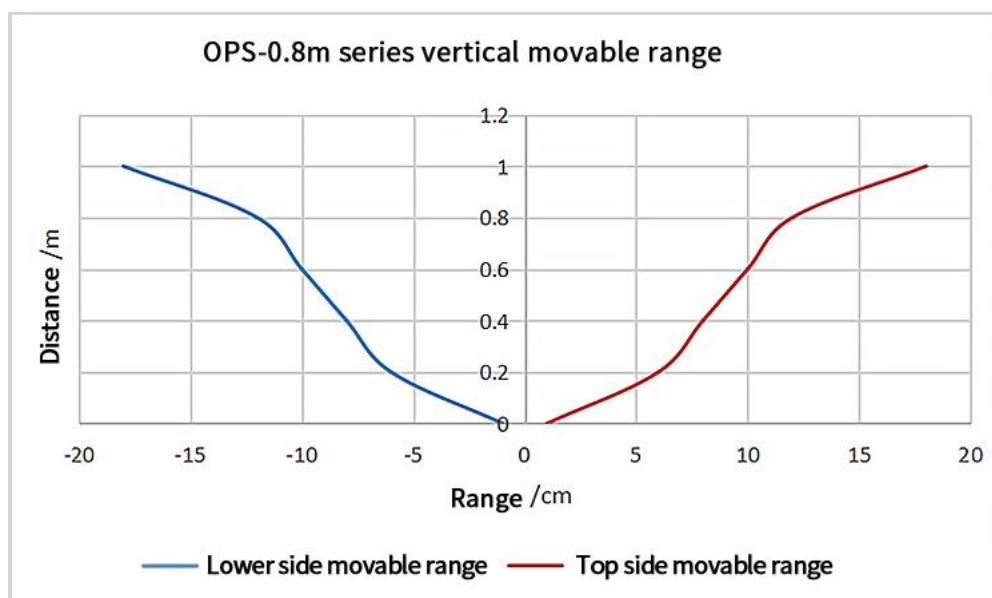


Left side:

Distance/m	0	0.2	0.4	0.6	0.8	1
Range/cm	1	8	10	15	22	30

Right side:

Distance/m	0	0.2	0.4	0.6	0.8	1
Range/cm	1	8	10	15	22	30



Top side:

Distance/m	0	0.2	0.4	0.6	0.8	1
Range/cm	1	6	8	10	12	18

Lower side:

Distance/m	0	0.2	0.4	0.6	0.8	1
Range/cm	1	6	8	10	12	18

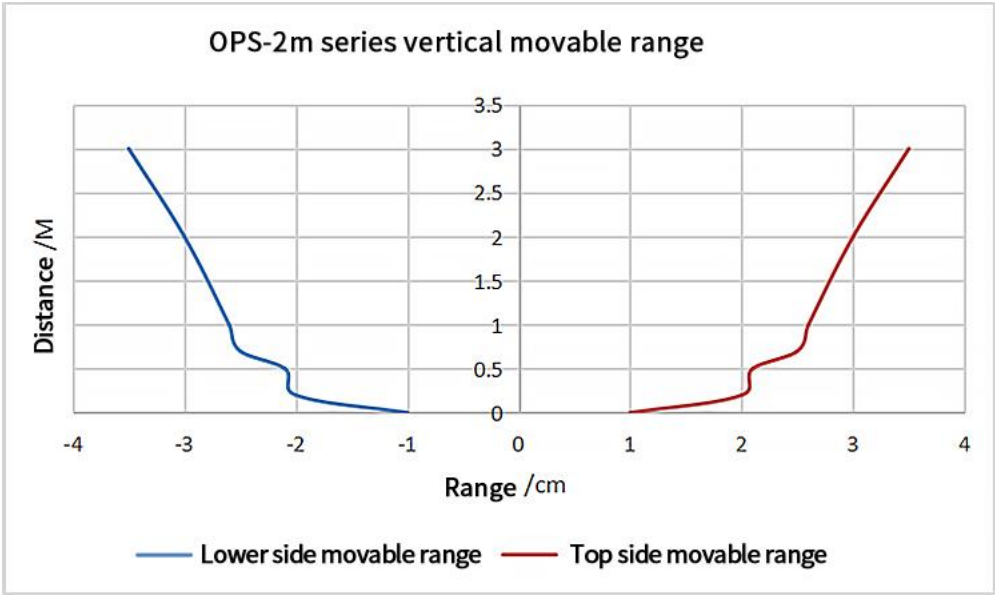


Left side:

Distance/m	0	0.2	0.5	0.7	1	2	3
Range/cm	1	2.25	2.75	3	3.25	4	4.5

Right side:

Distance/m	0	0.2	0.5	0.7	1	2	3
Range/cm	1	2.25	2.75	3	3.25	4	4.5



Top side:

Distance/m	0	0.2	0.5	0.7	1	2	3
Range/cm	1	2	2.1	2.5	2.6	3	3.5

Lower side:

Distance/m	0	0.2	0.5	0.7	1	2	3
Range/cm	1	2	2.1	2.5	2.6	3	3.5

4.7.3 5 meters series

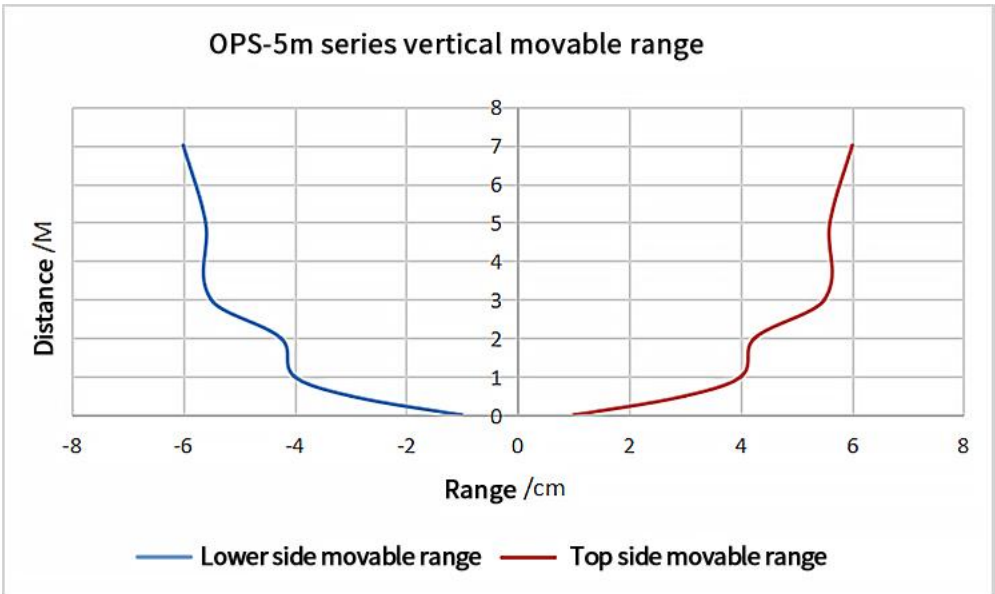


Left side:

Distance/m	0	0.5	1	2	3	5	7
Range/cm	1	6	8	9.5	12.5	13	14

Right side:

Distance/m	0	0.5	1	2	3	5	7
Range/cm	1	6	8	9.5	12.5	13	14



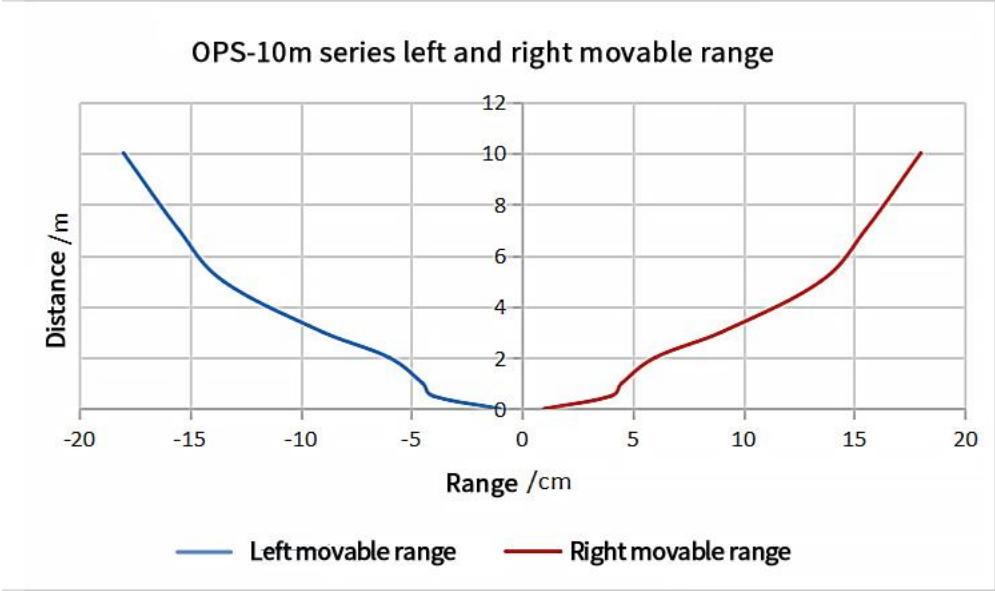
Top side:

Distance/m	0	0.5	1	2	3	5	7
Range/cm	1	3	4	4.25	5.5	5.6	6

Lower side:

Distance/m	0	0.5	1	2	3	5	7
Range/cm	1	3	4	4.25	5.5	5.6	6

4.7.4 10 meters series

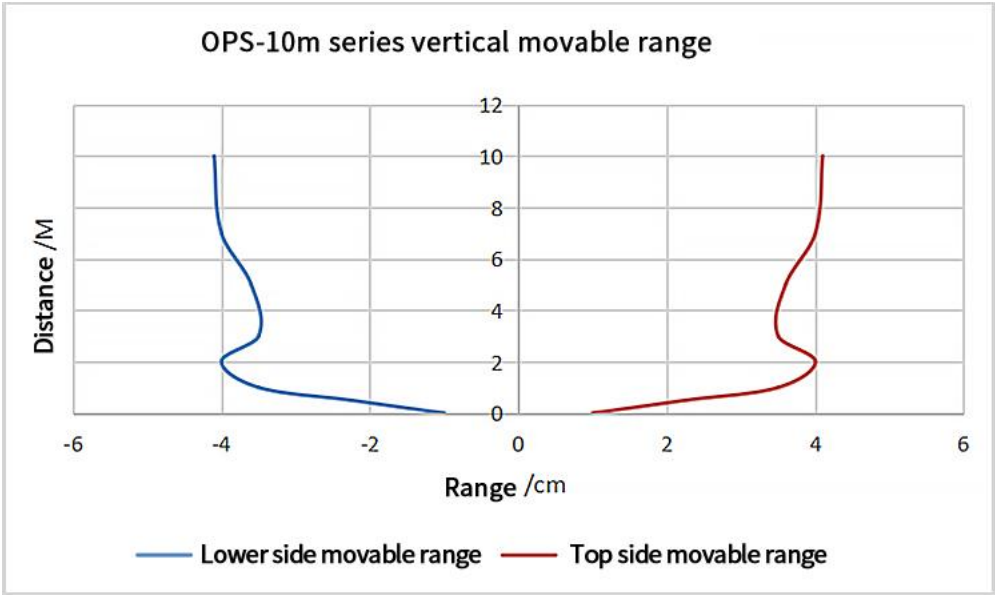


Left side:

Distance/m	0	0.5	1	2	3	5	7	10
Range/cm	1	4	4.5	6	9	13.5	15.5	18

Right side:

Distance/m	0	0.5	1	2	3	5	7	10
Range/cm	1	4	4.5	6	9	13.5	15.5	18



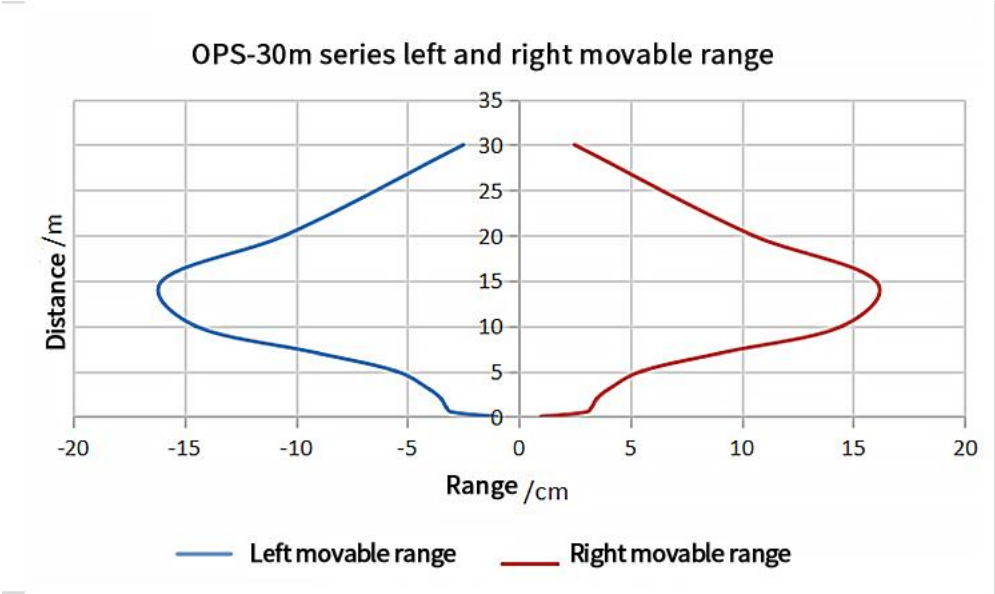
Top side:

Distance/m	0	0.5	1	2	3	5	7	10
Range/cm	1	2.25	3.5	4	3.5	3.6	4	4.1

Lower side:

Distance/m	0	0.5	1	2	3	5	7	10
Range/cm	1	2.25	3.5	4	3.5	3.6	4	4.1

4.7.5 30 meters series

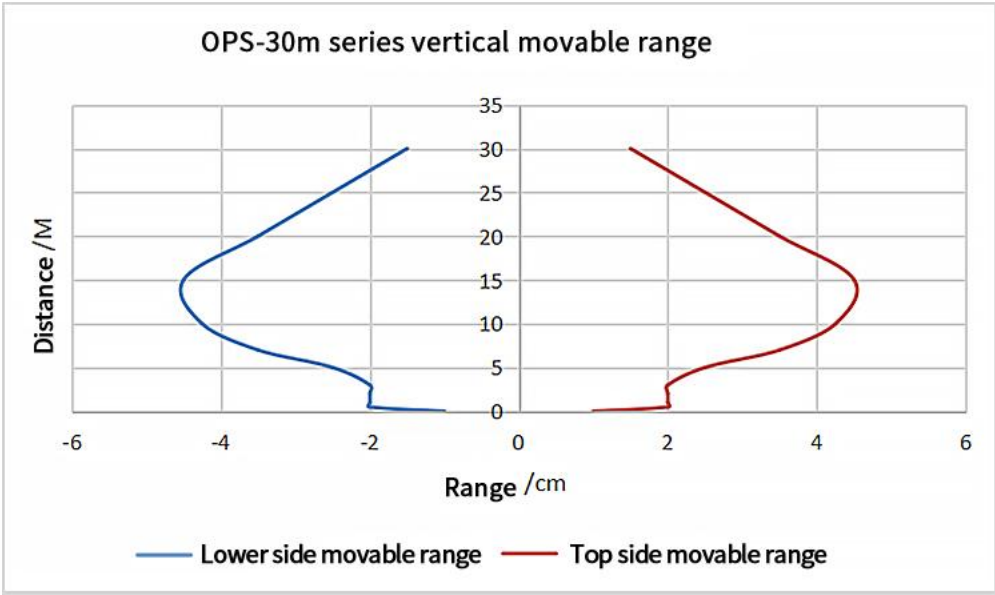


Left side:

Distance/m	0	0.5	1	2	3	5	7	10	15	20	30
Range/cm	1	3	3.25	3.5	4	5.5	9	14.5	16	10.5	2.5

Right side:

Distance/m	0	0.5	1	2	3	5	7	10	15	20	30
Range/cm	1	3	3.25	3.5	4	5.5	9	14.5	16	10.5	2.5



Top side:

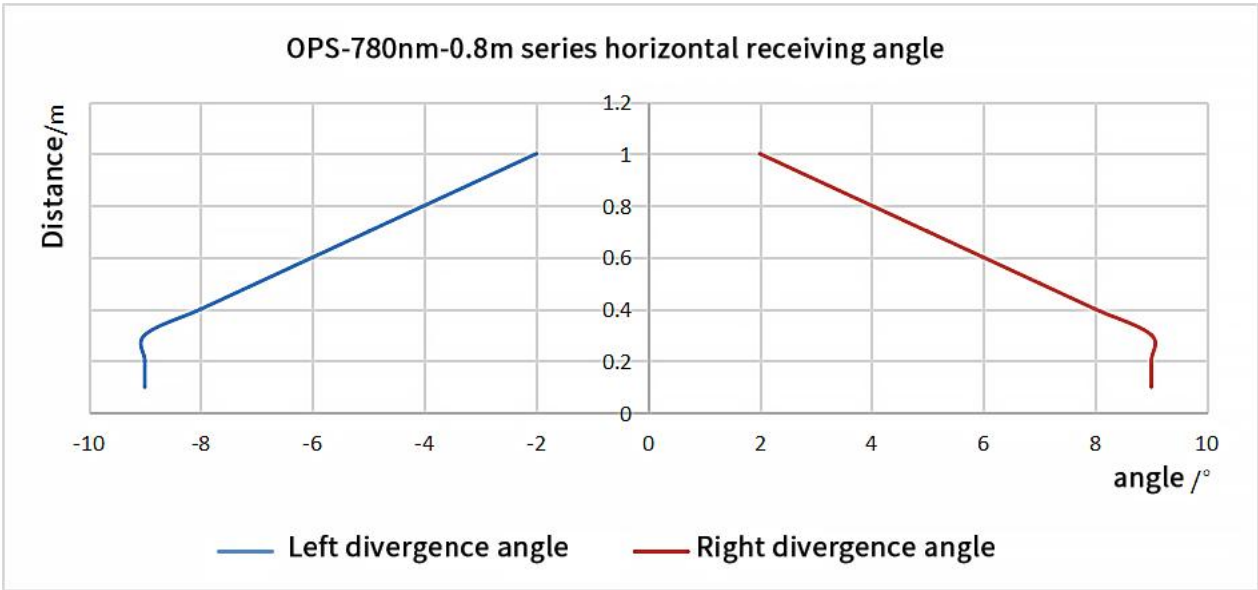
Distance/m	0	0.5	1	2	3	5	7	10	15	20	30
Range/cm	1	2	2	2	2	2.5	3.5	4.25	4.5	3.5	1.5

Lower side:

Distance/m	0	0.5	1	2	3	5	7	10	15	20	30
Range/cm	1	2	2	2	2	2.5	3.5	4.25	4.5	3.5	1.5

4.8 ACCEPTANCE ANGLE CURVE

4.8.1 0.8 meter series

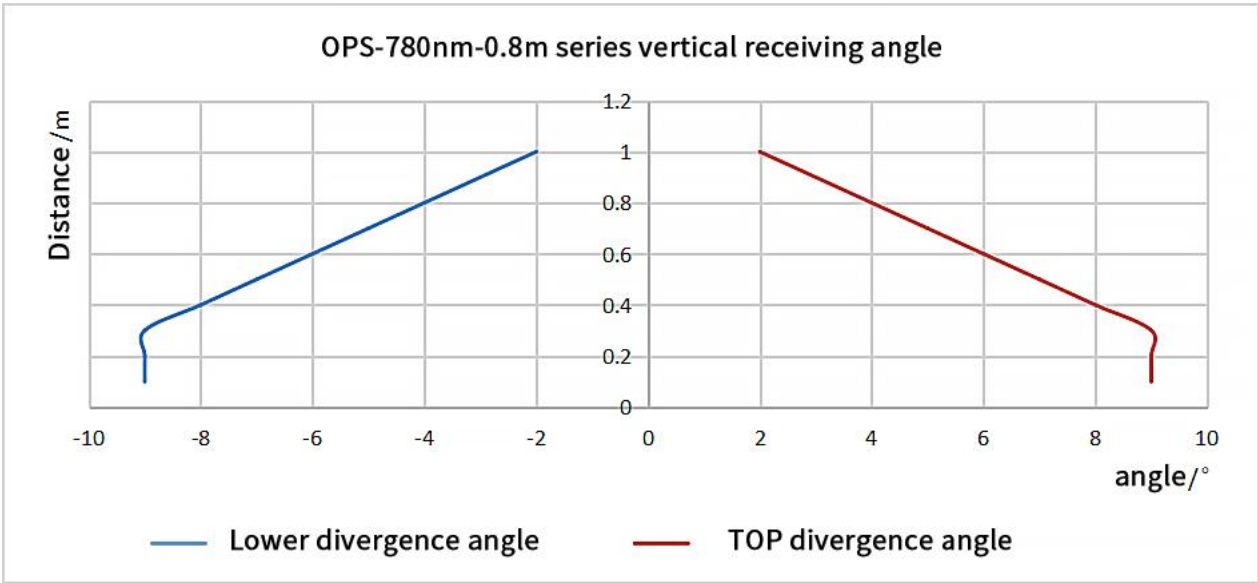


Left side:

Distance/m	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
Angle/°	-9	-9	-9	-8	-7	-6	-5	-4	-2

Right side:

Distance/m	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
Angle/°	9	9	9	8	7	6	5	4	2



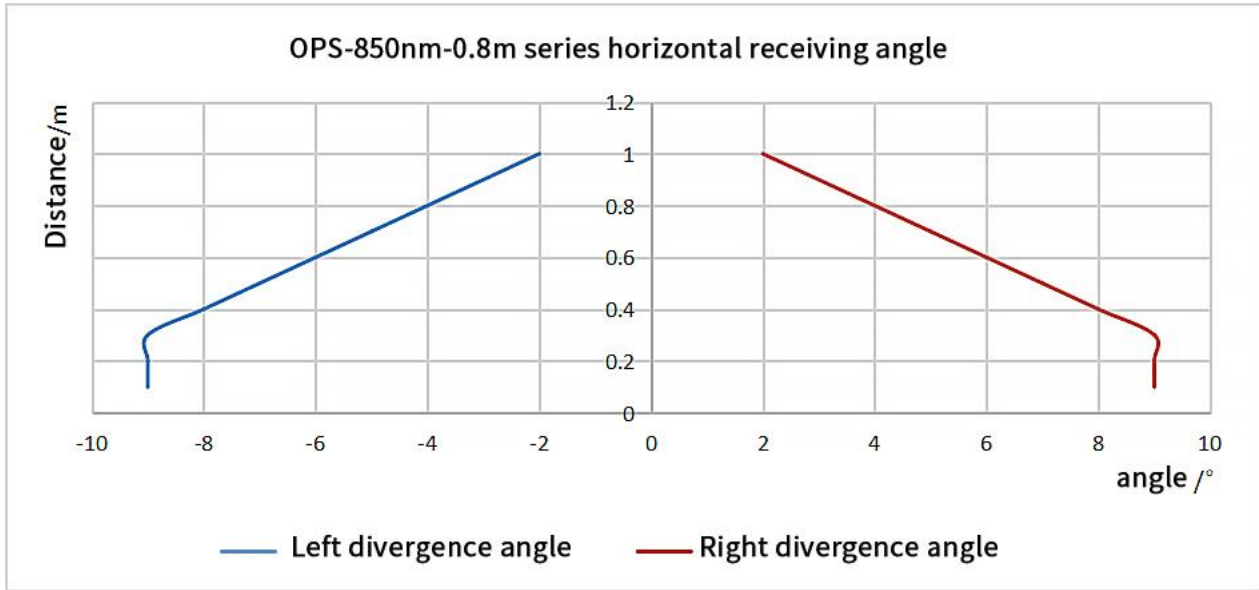
Top side:

Distance/m	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
Angle/°	9	9	9	8	7	6	5	4	2

Lower side:

Distance/m	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
------------	-----	-----	-----	-----	-----	-----	-----	-----	---

Angle/°	-9	-9	-9	-8	-7	-6	-5	-4	-2
---------	----	----	----	----	----	----	----	----	----

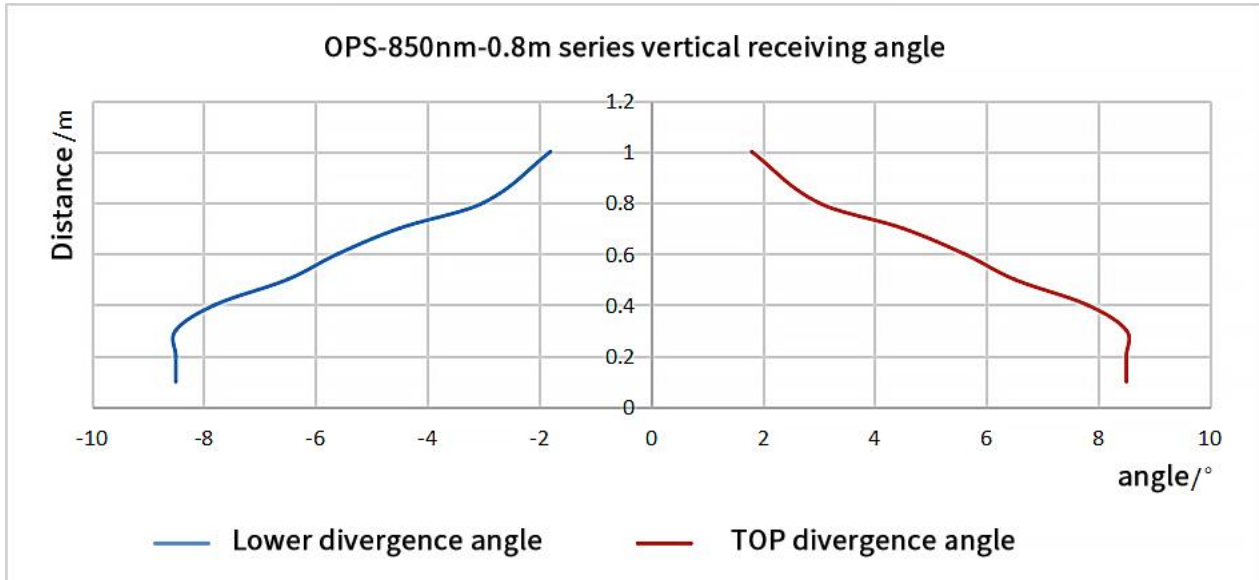


Left side:

Distance/m	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
Angle/°	-9	-9	-9	-8	-7	-6	-5	-4	-2

Right side:

Distance/m	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
Angle/°	9	9	9	8	7	6	5	4	2



Top side:

Distance/m	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
Angle/°	8.5	8.5	8.5	7.8	6.5	5.6	4.5	3	1.8

Lower side:

Distance/m	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
Angle/°	-8.5	-8.5	-8.5	-7.8	-6.5	-5.6	-4.5	-3	-1.8

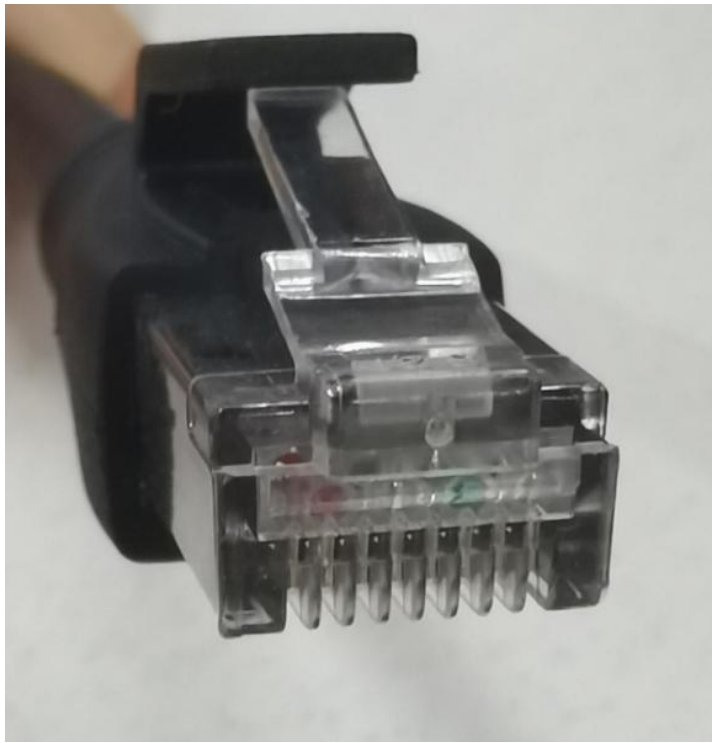
5 Cable Definition

5.1 PORTS AND CONVEYOR LINES

Ethernet TCP/IP	RS232 communication
2-way	1 way

Function	IO, RS232 communication, power supply, Ethernet communication
Type	Wire
Thread specification	FT10001-F2H, RJ45
Number of pins	14 pins
Wire outlet	Direct outlet

Terminal 1



Terminal	No.	Symbol	Color	Function
RJ45	Pin1	ETH TX+	Red and white	Ethernet output +
	Pin2	ETH TX-	Red	Ethernet output -
	Pin3	ETH RX+	Green and white	Ethernet input +
	Pin6	ETH RX-	Green	Ethernet input -

Terminal 2:



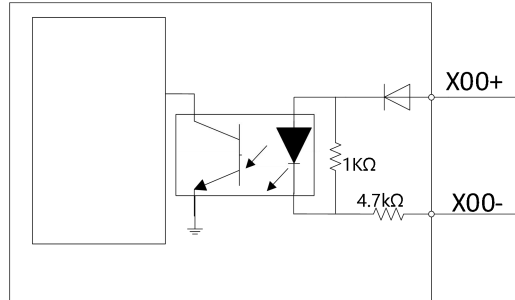
Terminals	Plastic shell	No.	Symbol	Color	Function
FT10001-F2H	FHG10001-S14M2W1B	Pin1	+VIN	Brown	Power positive input
		Pin2	-VIN	Blue	Power negative input
		Pin3	Y00+	Brown and white	Optical link successful +
		Pin4	Y00-	Black	Optical link successful -
		Pin5	X00+	Orange	Data transmission prohibited +
		Pin6	X00-	Yellow	Data transmission prohibited -
		Pin7	RS232 TX	Green	RS232 send
		Pin8	RS232 RX	Purple	RS232 receive
		Pin9	RS232 GND	Gray	RS232 ground
		Pin10	SHELL	White	Casing ground
		Pin11	-	White	Empty
		Pin12	-	White and green	Empty
		Pin13	-	Red	Empty
		Pin14	-	White and red	Empty

5.2 INPUT AND OUTPUT SIGNAL CONNECTION

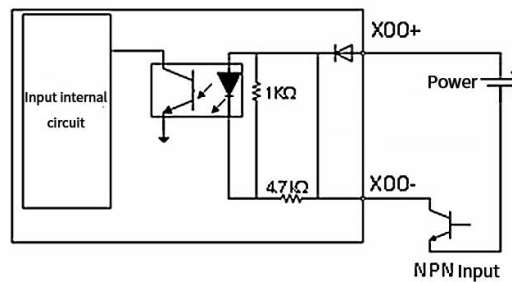
5.2.1 Input signal connection

Port	Function	Output logic
X00	Control the status of the optical module	ON: The device is in silent mode and does not send data. OFF: The device is in normal mode and sends and receives data normally;

Use external power supply: COM+ input $DC24V \pm 20\%$, more than 100mA;

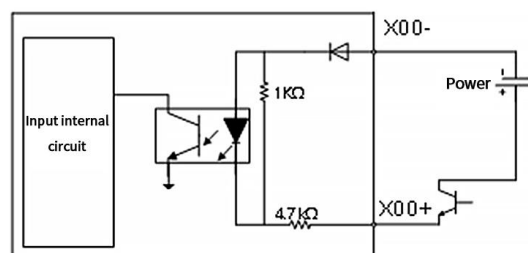


NPN signal wiring diagram

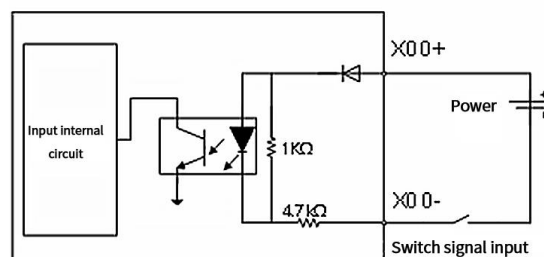


PNP signal wiring diagram

Using external power supply: COM-input $DC24V \pm 20\%$, more than 100mA;



Switch Wiring Diagram

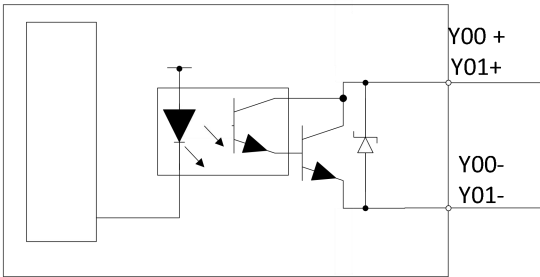


5.2.2 Output signal wiring

Output signal usage function

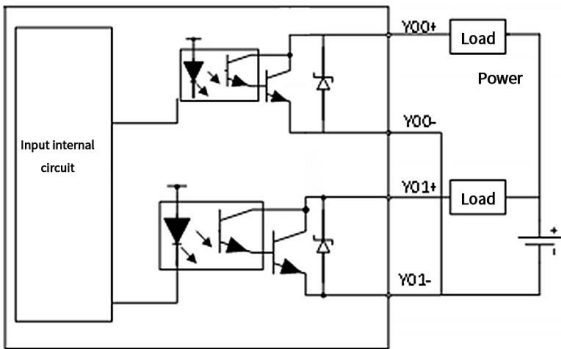
Port	Function	Output logic
Y00	Connection status	ON: Optical communication bidirectional connection is successful. OFF: Optical communication is not established;

The maximum load capacity of the output port is 100mA.



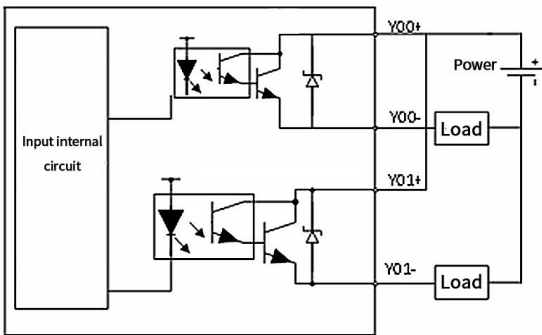
NPN signal output wiring diagram

Please refer to the following figure for the output schematic diagram:



PNP signal output wiring diagram

Please refer to the following figure for the output schematic diagram:



Notice	
	The input and output ports cannot be short-circuited or connected to loads exceeding the specified current, otherwise the ports will be damaged.

6 Host computer connection (optional)

6.1 ILLUSTRATE

The sensor and the host computer use a communication connection method that supports RS232 module data transmission. The sensor can work in this data output state, and the host computer obtains information according to demand.

Term explanation

Host computer: It is the client device, the sensor directly controls the end. Generally, it is a PLC, a single-chip microcomputer or an industrial computer device, etc.;

6.2 RS232 HOST COMPUTER DEBUGGING

6.2.1 Preparation for Debugging

6.2.2 Software Preparation

Name: Hinson Technology OPS host computer software

Software introduction: Xingsong Technology OPS host computer software, a host computer software used to obtain OPT sensor parameters, can display host signal strength, slave signal strength and other information in real time, and can draw signal strength information curves. It is developed by Xingsong Technology Co., Ltd.

How to obtain: provided by our sales staff.

6.2.3 Hardware Preparation

Serial port cable: USB to RS232 port cable.

Computer requirements: Windows 7 and above.

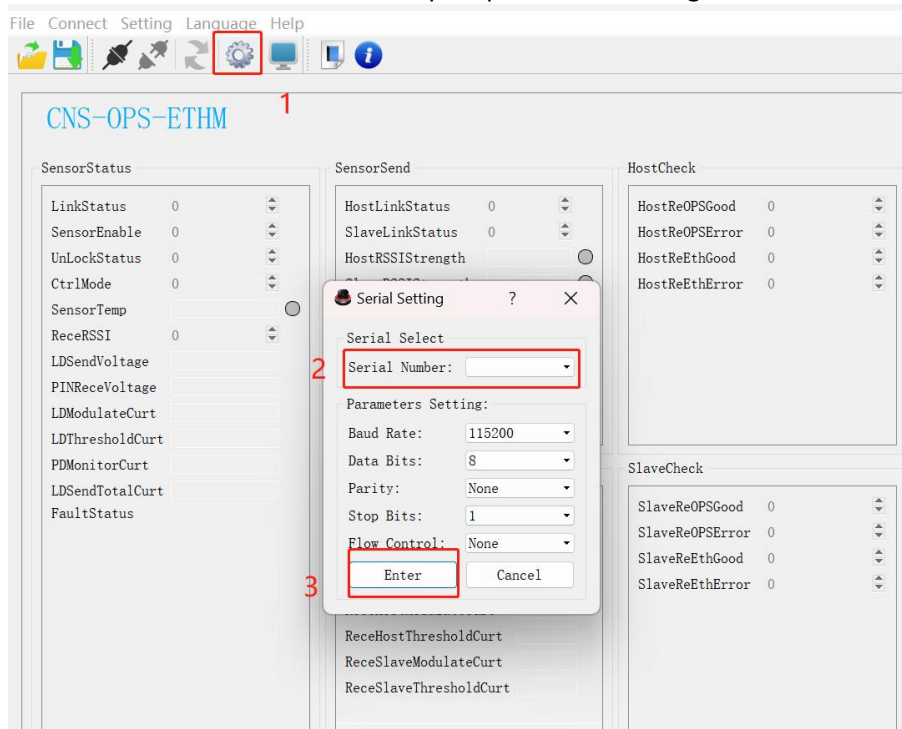
Wiring instructions: Pre-connect the RS232 port to the PC via the USB to RS232 cable, connect the RS232 terminal TX port to the sensor Pin10, RS232-RX (dark purple line), connect the RS232 terminal RX port to the sensor Pin11, RS232-TX (black line), and connect the RS232 terminal GND port to the sensor Pin12, RS232-GND (light purple line).

6.2.4 Start debugging

6.2.5 Hinson Technology OPS host computer software serial port settings

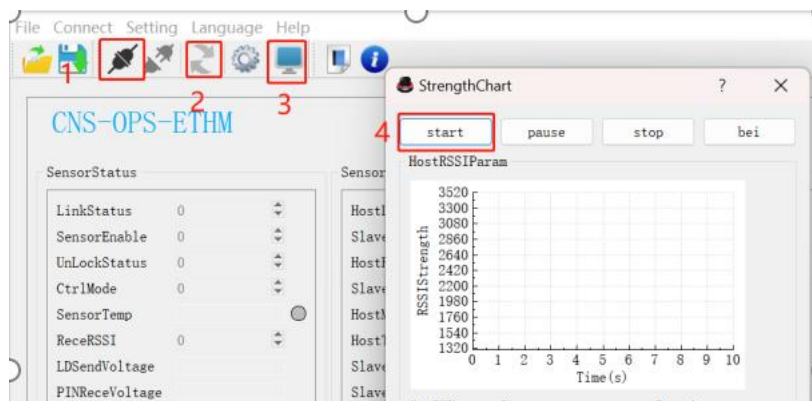
Open the OPS host computer software of Xingsong Technology and set the RS232 serial port parameters. As shown in the figure,

1. Click the serial port setting button of the software to open the serial port parameter setting interface.
2. Enter the serial port parameter setting interface and select the COM port corresponding to the serial port.
3. Click the OK button on the serial port parameter setting interface.



6.2.6 software obtains parameters and draws signal strength curves

1. Open the OPS host software, obtain the sensor parameters and draw the signal strength curve. As shown in the figure,
2. Click the connect device button of the software to connect the RS232 serial port.
3. Click the read parameter button of the software to read the sensor parameters.
4. Click the signal strength picture button of the software to open the signal strength parameter curve interface.
5. Click the start drawing button of the signal strength parameter curve to draw the real-time signal strength curve of the sensor.



7 Troubleshooting

7.1 FAULT DIAGNOSIS

When the optical data transmitter fails to work properly or the status of the optical data transmitter cannot be determined, follow the following process to diagnose and confirm the fault.

Fault	Solution
No data transmission	Check the signal light intensity and wiring condition
Not working	Check the host computer to confirm the fault status (refer to Chapter 6 Host Computer Connection). Using the host computer, you can determine the cause and take corrective measures.

7.2 TROUBLESHOOTING

The optical data transmitter displays the fault status through the host computer

1: SersorTemp	1: Sensor overtemperature
2: LDLVoltage	2: LD transmitter undervoltage
3: LDHVoltage	3: LD transmitter overvoltage
4: PINLVoltage	4: PIN receiver undervoltage
5: PINHVoltage	5: PIN receiver overvoltage
6: SendCloseF	6: Transmitter shutdown failure
7: LDHModCurt	7: LD modulation overcurrent
8: LDHThrCurt	8: LD threshold overcurrent
9: PDHMinCurt	9: PD monitoring overcurrent
10: LDHCurt	10: LD transmitter overcurrent

Notice	
	Contact Guangdong Hinson Technology Co., Ltd./Customer Service! If the problem cannot be solved, please contact Guangdong Xingsong Technology Co., Ltd. Customer Service (Please refer to Chapter 8.4 Technical Support)

8 After-sales information

8.1 WARRANTY PERIOD

The sensor provides a limited-time warranty. If the sensor cannot be used normally due to quality problems or design defects during the warranty period, we will provide free after-sales maintenance.

- Warranty period: 2 years from sale.

8.2 WARRANTY SCOPE

If the product is within the warranty period and falls within the warranty conditions, we will repair or replace it free of charge

- The warranty and after-sales service of this product are limited to mainland China;
- The product cannot be used normally after unpacking due to transportation;
- The product itself cannot work properly due to damage to its components;
- Product design defects prevent normal use;

8.3 DISCLAIMER

Please pay attention to the following conditions when using the product. We will not provide free after-sales and warranty.

- Failure to install the product correctly according to the instructions, causing damage to the product;
- Using this product in unsuitable environments and conditions may cause product damage;
- Damage to the product due to failure to operate according to product instructions;
- Dismantle or repair the product without the permission of the company;
- Product damage caused by irresistible external forces such as natural disasters and fires.

8.4 TECHNICAL SUPPORT

If a fault occurs that cannot be rectified, please contact us as follows.

- 1) Tel: +86-757-22218956
- 2) Email: lixianjiao@hinson-xs.com
- 3) Company website: www.hinson-xs.com
- 4) Manufacturer: Guangdong Hinson Technology Co., Ltd.
- 5) WhatsApp: +8618670078135

	Read this specification sheet carefully before wiring.
	Wiring must be done with power outage
	Double insulation or reinforced insulation must be used between all input and output interfaces and hazardous voltages, otherwise electric shock may occur.
	Users are strictly prohibited from replacing cables without permission
	If you have any questions about use, please contact the relevant responsible person in time.



Guangdong Hinson Technology Co., Ltd

WWW.HINSON-XS.COM



Address: Room 101&301, Unit 1, Building 8 Mechanical Equipment Industrial, Shunye East Rd No.33,
Shunde district, Foshan city, Guangdong Province ,China