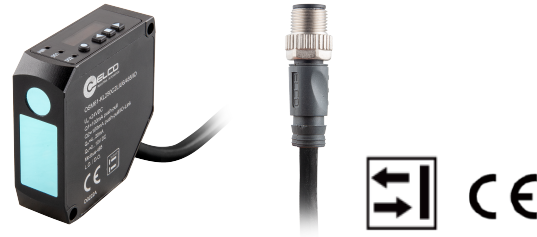


## Product Description:

- Micron-class laser distance
- Abundant interfaces support 485 output
- Metal shell, OLED display and key setting
- Protection IP67



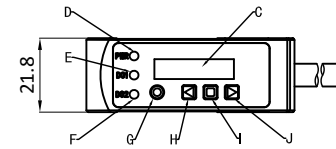
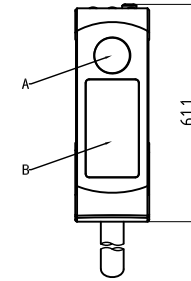
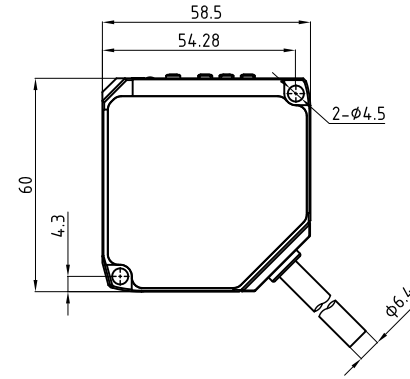
Type	Distance	Resolution	Linearity	Repeatability	Spot diameter
OSM61-KL30C2BLIU6/485 xM	30±4mm	1um	±0.1%F.S.	1um	Φ0.8mm@30mm
OSM61-KL30C2BLIU6/485-x-Q12.8					
OSM61-KL50C2BLIU6/485 xM	50±10mm	1um	±0.1%F.S.	2um	Φ1mm@50mm
OSM61-KL50C2BLIU6/485-x-Q12.8					
OSM61-KL85C2BLIU6/485 xM	85±20mm	1um	±0.1%F.S.	3um	Φ1.2mm@85mm
OSM61-KL85C2BLIU6/485-x-Q12.8					
OSM61-KL120C2BLIU6/485 xM	120±60mm	1um	±0.1%F.S.	8um	Φ1.2mm@120mm
OSM61-KL120C2BLIU6/485-x-Q12.8					
OSM61-KL250C2BLIU6/485 xM	250±150mm	10um	±0.3%F.S.	20um	Φ1.3mm@250mm
OSM61-KL250C2BLIU6/485-x-Q12.8					

## TECHNICAL SPECIFICATION

Supply voltage	24VDC±10%	Current consumption	≤100mA
Power	< 2W	Light source	635nm red laser class 2
Analog output	4...20mA/0-10V	Switch output	2*NPN/PNP/Push-Pull
Communication	RS485	External input	Used for zero setting , reset and laser control
Circuit protection	Reverse polarity protection Short-circuit protection Over-load protection	Response time	200us/500us/1ms/2ms
Ambient temperature	-20 C ...+60 C	Operating temperature	-10 C ...+50 C
Withstand voltage	1000V/AC/ 50/60Hz 60s	Insulation impedance	≥20MΩ (500VDC)
Shock resistance	amplitude 0.5mm frequency 10...55Hz test direction X,Y,Z 2hr	Impact resistance	500m/s <sup>2</sup> (50G)X,Y,Z 3 times
Connection	Cable/Pigtail	Protection	IP67
Material	Shell: aluminum alloy; Window: glass	Dimension	61.1*21.8*58.5mm

\*Note: Please warm up the products for 30 minutes before use.

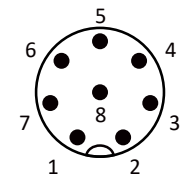
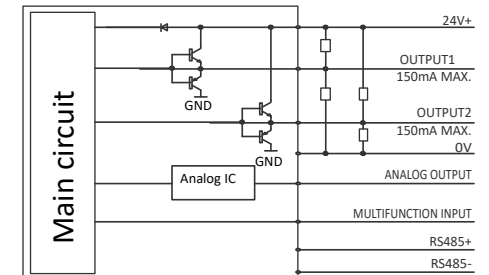
## DIMENSIONS



- A. Emitter
- B. Receiver
- C. Display
- D. Alarm indicator
- E. Switching quantity 1 Output indicator
- F. Switching quantity 2 Output indicator
- G. Backspace key
- H. Page up key
- I. Confirm key
- J. Scroll down key

## INTERFACE OUTPUT

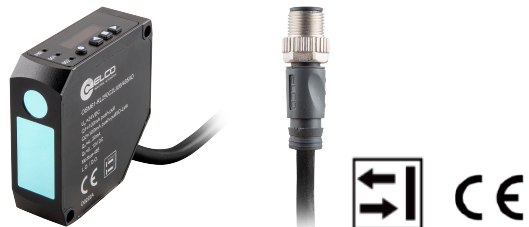
NO.	Colour	Cable Feature	Pigtail Feature
1	WH	Switching quantity 1	RS485-
2	BN	24V +	24V +
3	GN	RS485-	Analog V/mA
4	YE	RS485+	Switching quantity 1
5	GY	Analog V/mA	Switching quantity 2
6	PK	External input	RS485+
7	BU	0V	0V
8	RD	Switching quantity 2	External input



CO12.8-2/WS/P  
2M connector model

## 产品特性:

- 微米级激光测距
- 接口丰富支持485输出
- 金属外壳, OLED显示与按键设置
- 防护等级IP67



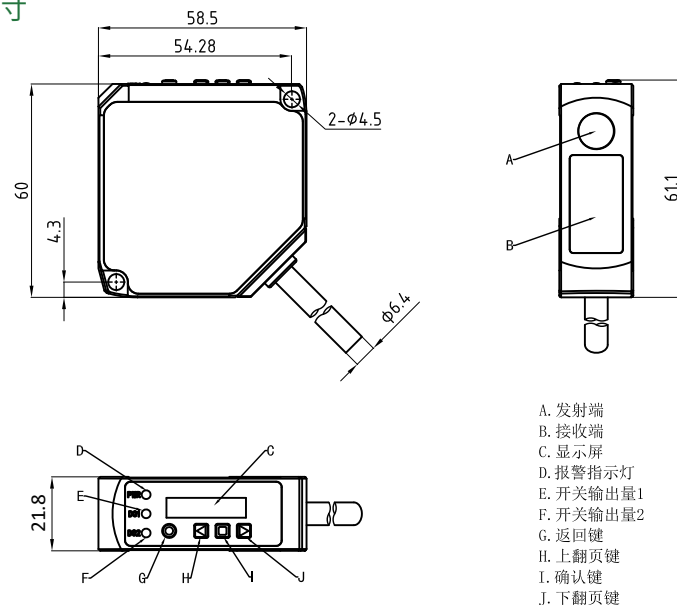
型号	量程	分辨率	线性度	重复精度	光斑直径
OSM61-KL30C2BLIU6/485 xM	30±4mm	1um	±0.1%F.S.	1um	Φ0.8mm@30mm
OSM61-KL30C2BLIU6/485-x-Q12.8					
OSM61-KL50C2BLIU6/485 xM	50±10mm	1um	±0.1%F.S.	2um	Φ1mm@50mm
OSM61-KL50C2BLIU6/485-x-Q12.8					
OSM61-KL85C2BLIU6/485 xM	85±20mm	1um	±0.1%F.S.	3um	Φ1.2mm@85mm
OSM61-KL85C2BLIU6/485-x-Q12.8					
OSM61-KL120C2BLIU6/485 xM	120±60mm	1um	±0.1%F.S.	8um	Φ1.2mm@120mm
OSM61-KL120C2BLIU6/485-x-Q12.8					
OSM61-KL250C2BLIU6/485 xM	250±150mm	10um	±0.3%F.S.	20um	Φ1.3mm@250mm
OSM61-KL250C2BLIU6/485-x-Q12.8					

## 技术参数

供电电压	24VDC±10%	消耗电流	≤100mA
功率	<2W	光源	635nm红色激光 激光2级
模拟量输出	4...20mA,0...10V可切换	开关量输出	2*NPN/PNP/推挽可切换
通讯方式	RS485	外部输入	可用于调零、复位、激光使能
保护回路	短路保护 过载保护 反极性保护	响应时间	200us/500us/1ms/2ms可切换
环境温度	-20°C...+60°C	工作温度	-10°C...+50°C
耐电压	1000V/AC/ 50/60Hz 60s	绝缘阻抗	≥20MΩ (500VDC)
耐振动	复振幅1.5mm 10...50Hz X,Y,Z,方向各两小时	耐冲击	500m/s <sup>2</sup> (50G)X,Y,Z各三次
接线方式	线缆/Pigtail	防护等级	IP67
材质	外壳: 铝合金; 窗口: 玻璃	外形尺寸	61.1*21.8*58.5mm

注1: 本产品为激光类产品, 上电预热三十分钟后使用。

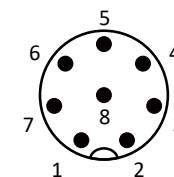
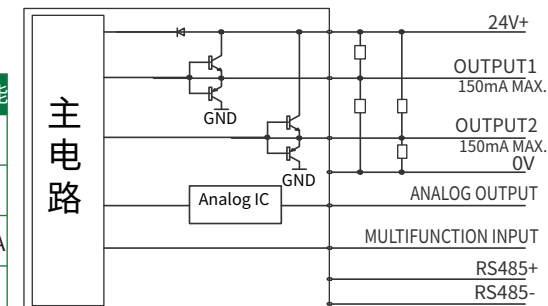
## 外形尺寸



- A. 发射端
- B. 接收端
- C. 显示屏
- D. 报警指示灯
- E. 开关输出量1
- F. 开关输出量2
- G. 返回键
- H. 上翻页键
- I. 确认键
- J. 下翻页键

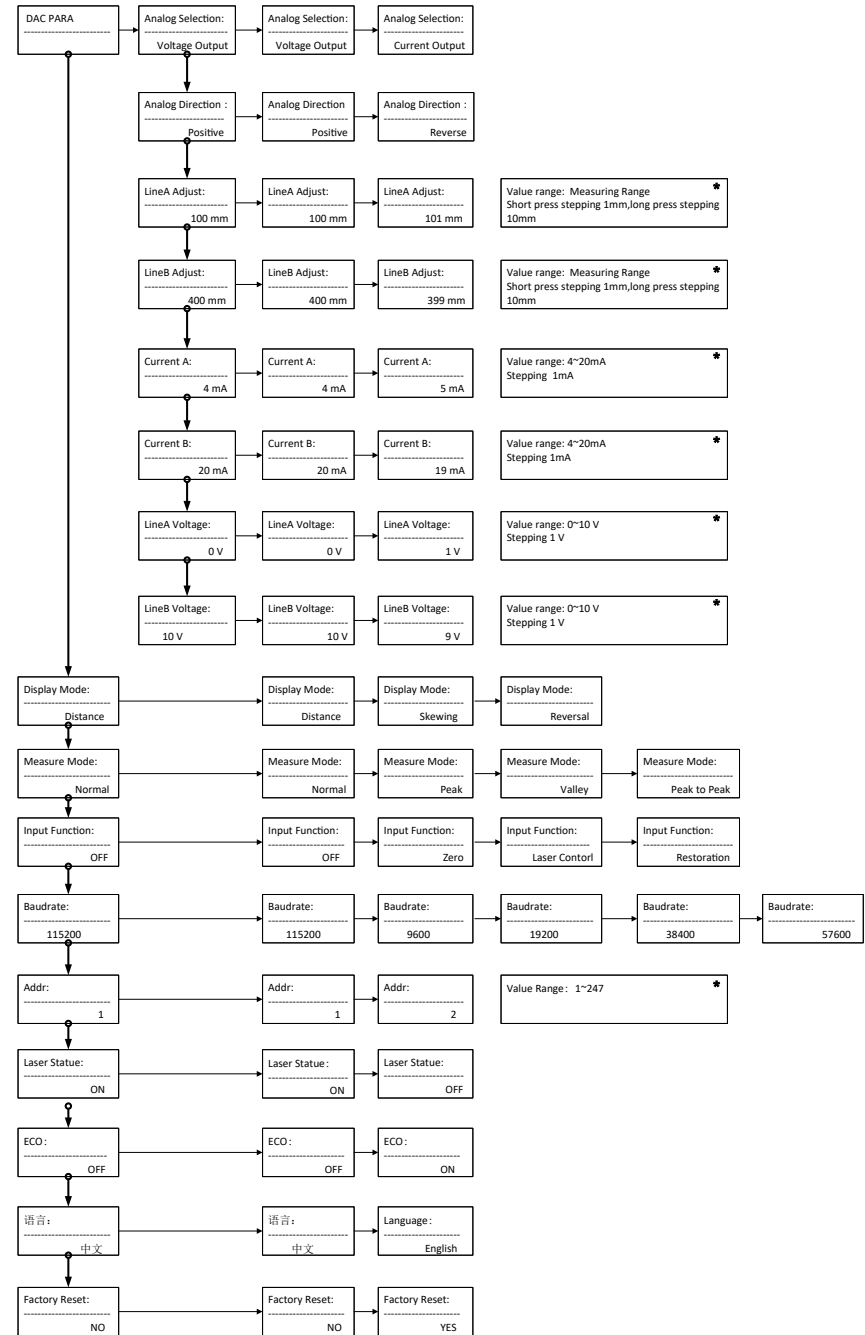
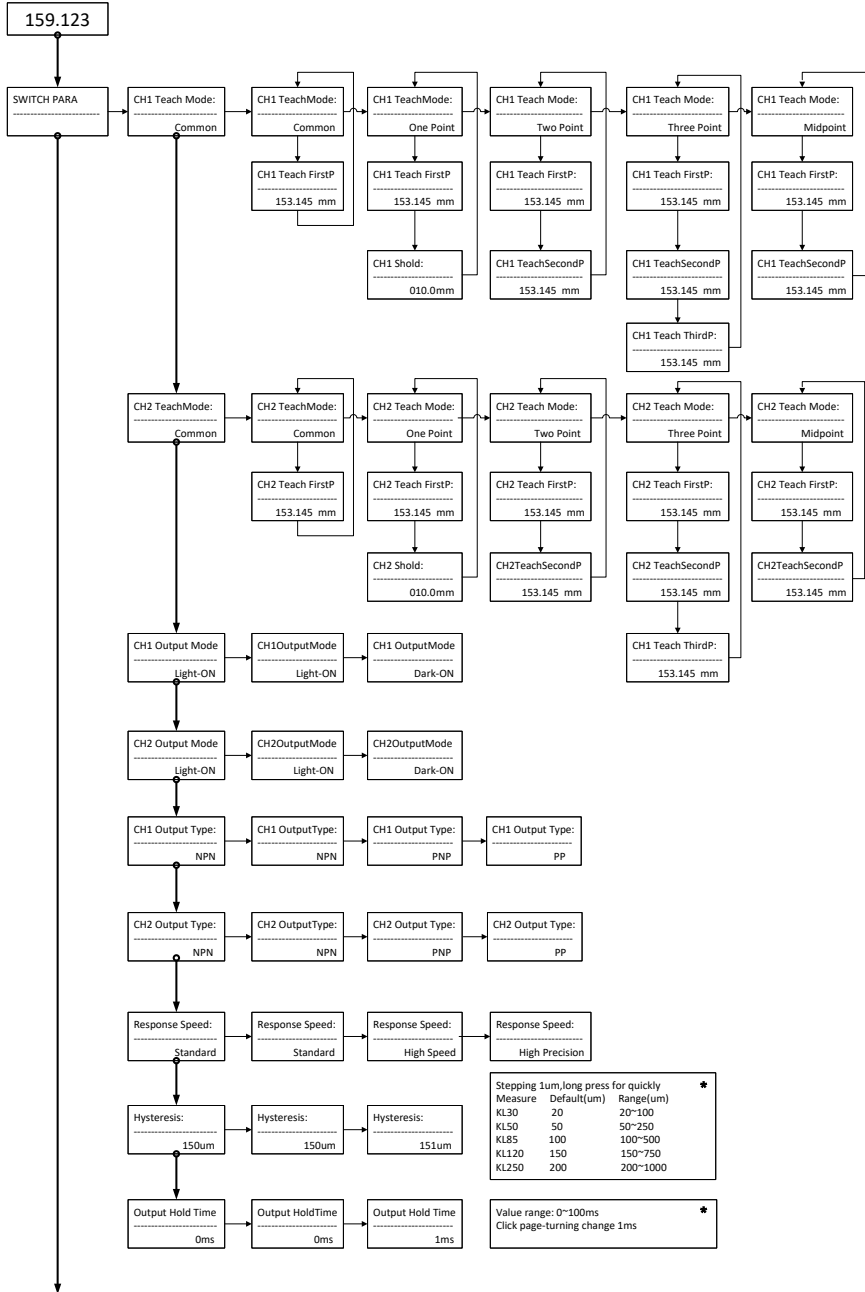
## 接线图

序号	线色	出线功能	Pigtail功能
1	白	开关量1	RS485-
2	棕	24V +	24V +
3	绿	RS485-	模拟量V/mA
4	黄	RS485+	开关量1
5	灰	模拟量V/mA	开关量2
6	粉	外部输入	RS485+
7	蓝	0V	0V
8	红	开关量2	外部输入

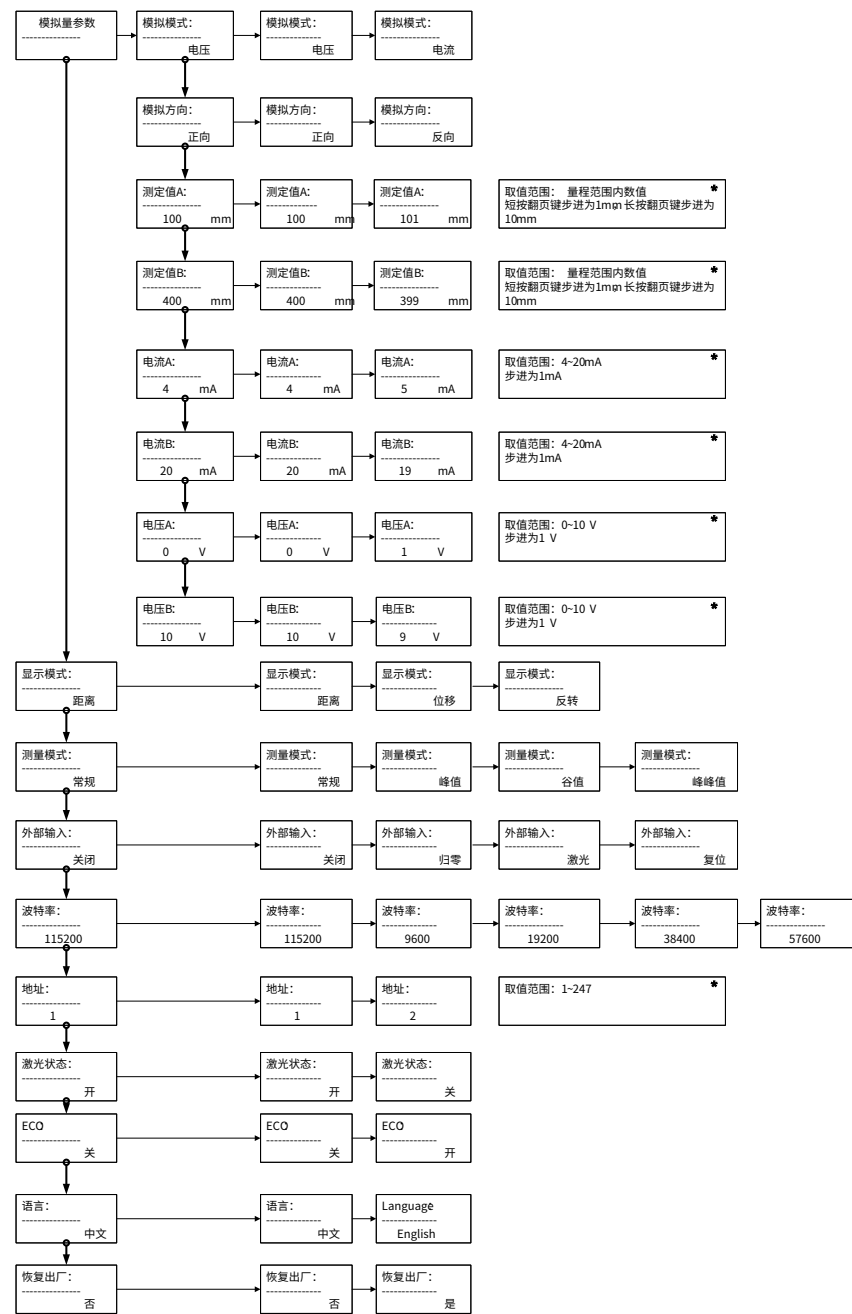
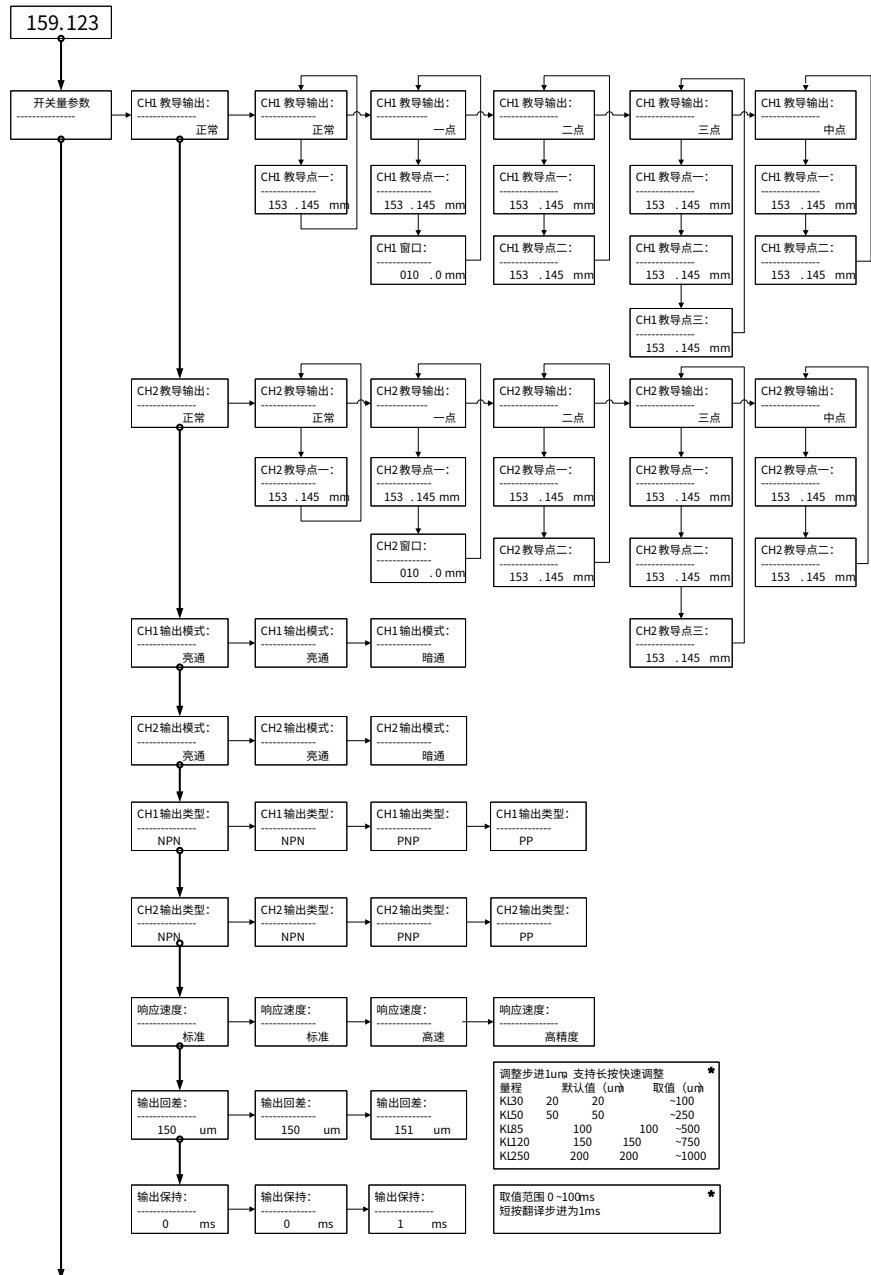


CO12.8-2/WS/P  
2M pigtail 连接器

MENU PROCESS



菜单流程



## DISPLAY INTERFACE DESCRIPTION

Indicator light and keys

PWR: Red alarm indicator, flashing when out of range or malfunction, always off during normal conditions.

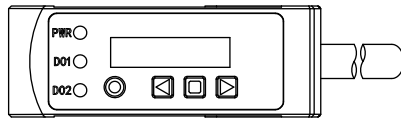
DO1: Yellow switch CH1 output indicator

DO2: Yellow switch CH2 output indicator

⊙ Backspace key   ⊞ Page up key   ⊞ Enter key   ⊞ Page down key

Measuring interface

When the sensor is turned on, it will automatically enter the measurement interface to display the measured value, and it will display "999.999mm" if it is out of range.



## OPERATION GUIDE

Enter the menu: press and hold the "Enter key" for more than 3S to enter the main menu;

Exit the menu: short press "Return key" or long press "Enter key" to exit the menu and enter the measurement interface;

In the menu: 1. The enter key selects a parameter, the page-turning key changed the parameter.

2. Short press the enter key, save the parameter and return to the previous menu; long press the enter key, save the parameter and return to the measurement interface.
3. Short press backspace key, return to the previous menu and the parameter can't be save.

### SWITCH PARA

#### CH1/CH2 teach mode settings

Enter the main menu, press the up/down switching option, and when "CH1 Teach Mode" or "CH2 Teach Mode" is displayed, press the Enter key to select this option, and enter the setting interface of CH1/CH2 teach mode.

#### Common

Press "Up"/"Down" in the CH1/CH2 teaching output setting interface to switch the teaching mode. When "Common" is displayed, press the Enter key to set the teaching point, display the current distance value, move the target to the appropriate position, and press the Enter key to set the teaching point.

#### One Point Teaching Mode

In the CH1/CH2 teaching output setting interface, press up/down to switch the teaching mode. When "One Point" is displayed, press Enter key to set the teaching point, display the current distance value, move the target to the appropriate position, press Enter key to set the teaching point, "CH1 shold"/"CH2 shold", press up/down to adjust the window value, and press the Enter key to set the window.

#### Two Point Teaching Mode

In the CH1/CH2 teaching output setting interface, press the up/down button to switch the teaching mode and display "Two Point", press the Enter key to set the teaching point, display the current distance value, move the target to the appropriate position, and set the teaching point 2 by pressing the Enter key.

#### Three Point Teaching Mode

In the CH1/CH2 teaching output setting interface, when the "Three Point" are displayed, press the Enter key to set the teaching point, display the current distance value, move the target to the appropriate position, press the Enter key to set the teaching point 1, display the current distance value, move the target to the appropriate position, press the Enter key to set the teaching point 2, display the current distance value, move the target to the appropriate position and set the teaching point 3.

#### Midpoint Teaching Mode

In CH1/CH2 teaching output setting interface, press up/down to switch. When the "Midpoint" is displayed, press the Enter key to set the teaching point, display the current distance value, move the target to the appropriate position, press the Enter key to set the teaching point 1, display the current distance value, move the target to the appropriate position, press the Enter key to set the teaching point 2, display the "offset", press up/down to adjust the window value, and press the Enter key to set the window.

#### CH1/CH2 Output Mode

Enter the main menu, press the up/down switching option, and when "CH1 Output Mode" or "CH2 Output Mode" is displayed, press the Enter key to select this option, and enter the CH1/CH2 output mode setting interface.

Light-on

In the output mode setting interface, press Up/down, and when "Light-on" is displayed, press the Enter key to set the output mode of CH1/CH2 to Light-on.

Dark-on

In the output mode setting interface, press Up/down, and when "Dark-on" is displayed, press the Enter key to set the output mode of CH1/CH2 as Dark-on.

CH1/CH2 Output Type

Enter the main menu, press the up/down switching option, and when "CH1 Output Type" or "CH2 Output Type" is displayed, press the Enter key to select this option to enter the setting interface of CH1/CH2 output type.

NPN

In the output type setting interface, press Up/down. When "NPN" is displayed, press the Enter key to set the output type of CH1/CH2 to NPN.

PNP

In the output type setting interface, press Up/down. When "PNP" is displayed, press the Enter key to set the output type of CH1/CH2 to PNP.

PP

In the output type setting interface, press Up/down. When "PP" is displayed, press the Enter key to set the output type of CH1/CH2 to Push-Pull.

Response Speed

Enter the main menu, press the up/down switching option, and when "Response Speed" is displayed, press the Enter key to select this option and enter the response speed setting interface.

Standards

In the response speed setting interface, press Up/down, and when "Standard" is displayed, press the Enter key to set the response speed as standard (sampling period is 1000us).

High speed

In the response speed setting interface, press Up/down, and when "High Speed" is displayed, press the Enter key to set the response speed to high speed (sampling period is 200us).

High precision

In the response speed setting interface, press Up/down, and when "High Precision" is displayed, press the Enter key to set the response speed to high precision (sampling period is 2000us).

Hysteresis

Enter the main menu, press the up/down switching option, and when "Hysteresis" is displayed, press the Enter key to select this option to enter the setting interface of switching hysteresis

Press Up/down to adjust the return value, and press Enter to set the Switching hysteresis value.

Output Hold Time

Enter the main menu, press the up/down switching option, and when "Output Hold Time" is displayed, press the Enter key to select this option and enter the output hold setting interface.

Press Up/Down to adjust the output holding time, and press Enter to set the output holding time.

DAC PARA

Analog Selection

Enter the main menu, press the up/down switching option, and when "Analog Selection" is displayed, press the Enter key to select this option to enter analog output mode setting interface.

Voltage Output

In the analog output mode setting interface, press the up/down. When "Voltage Output" is displayed, press the Enter key to set the analog output mode to voltage mode.

Current Output

In the analog output mode setting interface, press the up/down. When "Current Output" is displayed, press the Enter key to set the analog output mode to current mode.

## 显示界面说明

### 指示灯及按键

PWR:红色报警指示灯, 超量程及故障时闪烁, 正常状态熄灭

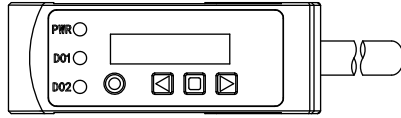
DO1:黄色开关量CH1输出指示灯

DO2:黄色开关量CH2输出指示灯

⊙ 返回键 ◀ 上翻页 □ 确认键 ▶ 下翻页

### 测量界面

传感器开机自动进入测量界面显示测量值, 超出量程显示“999.999mm”。



## 操作指南

进入菜单: 长按“确认键”3S 以上, 进入主菜单;

退出菜单: 短按“返回键”或长按“确认键”退出菜单, 进入测量界面;

在菜单中: 1. 确认键选中某一参数, 翻页键进行参数修改;

2. 短按确认键, 保存修改后的参数并返回上层界面; 长按确认键保存参数并返回测量界面

3. 短按返回键返回上层界面且未保存参数无法保存

### 开关量参数

#### CH1/CH2 教导输出设置

进入主菜单, 按上翻/下翻切换选项, 显示“CH1 教导输出”或“CH2 教导输出”时, 按确认键选中该选项, 进入 CH1/CH2 教导输出设置界面。

#### 常规教导模式

在 CH1/CH2 教导输出设置界面按上翻/下翻切换教导模式, 显示“正常”时, 按确认键进行教导点设置, 显示当前距离值, 将靶标移动到合适位置, 按确认键设置教导点。

#### 一点教导模式

在 CH1/CH2 教导输出设置界面按上翻/下翻切换教导模式, 显示“一点”时, 按确认键进行教导点设置, 显示当前距离值, 将靶标移动到合适位置, 按确认键设置教导点, 显示“CH1窗口”/“CH2窗口”, 按上翻或下翻调整窗口值, 按确认键设置窗口。

#### 二点教导模式

在 CH1/CH2 教导输出设置界面按上翻/下翻切换教导模式, 显示“二点”时, 按确认键进行教导点设置, 显示当前距离值, 将靶标移动到合适位置, 按确认键设置教导点一, 显示当前距离值, 将靶标移动到合适位置, 按确认键设置教导点二。

#### 三点教导模式

在 CH1/CH2 教导输出设置界面按上翻/下翻切换教导模式, 显示“三点”时, 按确认键进行教导点设置, 显示当前距离值, 将靶标移动到合适位置, 按确认键设置教导点一, 显示当前距离值, 将靶标移动到合适位置, 按确认键设置教导点二, 显示当前距离值, 将靶标移动到合适位置, 按确认键设置教导点三。

#### 中点教导模式

在 CH1/CH2 教导输出设置界面按上翻/下翻切换教导模式, 显示“中点”时, 按确认键进行教导点设置, 显示当前距离值, 将靶标移动到合适位置, 按确认键设置教导点一, 显示当前距离值, 将靶标移动到合适位置, 按确认键设置教导点二, 显示“偏移量”, 按上翻/下翻调整窗口值, 按确认键设置窗口。

#### CH1/CH2 输出模式

进入主菜单, 按上翻/下翻切换选项, 显示“CH1 输出模式”或“CH2 输出模式”时, 按确认键选中该选项, 进入 CH1/CH2 输出模式设置界面。

#### 亮通

在输出模式设置界面, 按上翻/下翻, 显示“亮通”时, 按确认键设置 CH1/CH2 输出模式为亮通。

#### 暗通

在输出模式设置界面, 按上翻/下翻, 显示“暗通”时, 按确认键设置 CH1/CH2 输出模式为暗通。

#### CH1/CH2 输出类型

进入主菜单, 按上翻/下翻切换选项, 显示“CH1 输出类型”或“CH2 输出类型”时, 按确认键选中该选项, 进入 CH1/CH2 输出类型设置界面。

#### NPN

在输出类型设置界面, 按上翻/下翻, 显示“NPN”时, 按确认键设置 CH1/CH2 输出类型为 NPN。

#### PNP

在输出类型设置界面, 按上翻/下翻, 显示“PNP”时, 按确认键设置 CH1/CH2 输出类型为 PNP。

## PP

在输出类型设置界面, 按上翻/下翻, 显示“PNP”时, 按确认键设置 CH1/CH2 输出类型为推挽。

### 响应速度

进入主菜单, 按上翻/下翻切换选项, 显示“响应速度”时, 按确认键选中该选项, 进入响应速度设置界面。

#### 高速

在响应速度设置界面, 按上翻/下翻, 显示“高速”时, 按确认键设置响应速度为高速(采样周期 200us)。

#### 标准

在响应速度设置界面, 按上翻/下翻, 显示“标准”时, 按确认键设置响应速度为标准(采样周期 1000us)。

#### 高精度

在响应速度设置界面, 按上翻/下翻, 显示“高精度”时, 按确认键设置响应速度为高精度(采样周期 2000us)。

### 输出回差

进入主菜单, 按上翻/下翻切换选项, 显示“输出回差”时, 按确认键选中该选项, 进入输出回差设置界面。

按上翻/下翻, 调整回差值, 按确认键设置回差值。

### 输出保持

进入主菜单, 按上翻/下翻切换选项, 显示“输出保持”时, 按确认键选中该选项, 进入输出保持设置界面。按上翻/下翻, 调整输出保持时间, 按确认键设置输出保持时间。

### 模拟量参数

#### 模拟模式

进入主菜单, 按上翻/下翻切换选项, 显示“模拟模式”时, 按确认键选中该选项, 进入模拟模式设置界面。

#### 电压

在模拟模式设置界面, 按上翻/下翻, 显示“电压”时, 按确认键设置模拟模式为电压模式。

#### 电流

在模拟模式设置界面, 按上翻/下翻, 显示“电流”时, 按确认键设置模拟模式为电流模式。

#### 模拟方向

进入主菜单, 按上翻/下翻切换选项, 显示“模拟方向”时, 按确认键选中该选项, 进入模拟方向设置界面。

#### 正向

在模拟方向设置界面, 按上翻/下翻, 显示“正向”时, 按确认键设置模拟方向为正向。

#### 反向

在模拟方向设置界面, 按上翻/下翻, 显示“反向”时, 按确认键设置模拟方向为反向。

### 测定值A

进入主菜单, 按上翻/下翻切换选项, 显示“测定值A”时, 按确认键选中该选项, 进入测定值A界面。按上翻/下翻, 调整数值, 按确认键设置测定值A。

### 测定值B

进入主菜单, 按上翻/下翻切换选项, 显示“测定值B”时, 按确认键选中该选项, 进入测定值B界面。按上翻/下翻, 调整数值, 按确认键设置测定值B。

### 电流A

进入主菜单, 按上翻/下翻切换选项, 显示“电流A”时, 按确认键选中该选项, 进入电流A设置界面。按上翻/下翻, 调整数值, 按确认键设置电流A值。

### 电流B

进入主菜单, 按上翻/下翻切换选项, 显示“电流B”时, 按确认键选中该选项, 进入电流B设置界面。按上翻/下翻, 调整数值, 按确认键设置电流B值。

### 电压A

进入主菜单, 按上翻/下翻切换选项, 显示“电压A”时, 按确认键选中该选项, 进入电压A设置界面。按上翻/下翻, 调整数值, 按确认键设置电压A值。

### 电压B

进入主菜单, 按上翻/下翻切换选项, 显示“电压B”时, 按确认键选中该选项, 进入电压B设置界面。按上翻/下翻, 调整数值, 按确认键设置电压B值。

**Analog Direction**

Enter the main menu, press the up/down switching option, and when "Analog Direction" is displayed, press the Enter key to select this option to enter analog direction setting interface.

**Positive**

In the analog output direction setting interface, press up/down. When "Positive" is displayed, press the Enter key to set the analog output direction as positive.

**Reverse**

In the Analog output direction setting interface, press up/down. When "Reverse" is displayed, press the Enter key to set the Analog output direction as reverse.

**LineA adjust**

Enter the main menu, press up/down switching option, and when "LineA Adjust" is displayed, press the Enter key to select this option to enter the LineA linear adjustment interface.

Press up/down to adjust the value, and press the Enter key to set the linear value of LineA.

**LineB Adjust**

Enter the main menu, press up/down switching option, and when "LineB Adjust" is displayed, press the Enter key to select this option to enter the LineB linear adjustment interface.

Press up/down to adjust the value, and press the Enter key to set the LineB linear value.

**Current A**

Enter the main menu, press the up/down switching option, and when "Current A" is displayed, press the Enter key to select this option to enter the LineA current setting interface.

Press up/down to adjust the value, and press the Enter key to set the LineA current value.

**Current B**

Enter the main menu, press the up/down switching option, and when "Current B" is displayed, press the Enter key to select this option to enter the LineB current setting interface.

Press up/down to adjust the value, and press the Enter key to set the LineB current value.

**LineA Voltage**

Enter the main menu, press the up/down switching option, and when "LineA Voltage" is displayed, press the Enter key to select this option to enter the LineA voltage setting interface.

Press up/down to adjust the value, and press the Enter key to set the LineA voltage value.

**LineB Voltage**

Enter the main menu, press the up/down switching option, and when "LineB Voltage" is displayed, press the Enter key to select this option to enter the LineB voltage setting interface.

Press up/down to adjust the value, and press the Enter key to set the LineB voltage value.

**Display Mode**

Enter the main menu, press the up/down switching option, and when "Display Mode" is displayed, press the Enter key to select this option to enter the display mode setting interface.

**Distance**

In the display mode setting interface, press up/down, and when "Distance" is displayed, press the Enter key to set the display mode to distance mode.

**Skewing**

In the display mode setting interface, press up/down, and when "Skewing" is displayed, press the Enter key to set the display mode as displacement mode.

**Reversal**

In the display mode setting reverse, press up/down, and when "Reversal" is displayed, press the Enter key to set the display mode as the reverse mode.

**Measure Mode**

Enter the main menu, press the up/down switching option, and when "Measurement Mode" is displayed, press the Enter key to select this option and enter the measurement mode setting interface.

**Normal**

In the measurement mode setting interface, press up/down, and when "Normal" is displayed, press the Enter key to set the measurement mode as the normal mode.

**Peak**

In the measurement mode setting interface, press up/down, and when "Peak" is displayed, press the Enter key to set the measurement mode to peak mode.

**Valley**

In the measurement mode setting interface, press up/down, and when "Valley" is displayed, press the Enter key to set the measurement mode to valley mode.

**Peak to peak**

In the measurement mode setting interface, press up/down, and when "Peak to Peak" is displayed, press the Enter key to set the measurement mode to peak-to-peak mode.

**Input function**

Enter the main menu, press the up/down switching option, and when "Input Function" is displayed, press the Enter key to select this option to enter the external input setting interface.

**OFF**

In the external input setting interface, press up/down. When "OFF" is displayed, press the Enter key to close the input function.

**Zero**

In the interface of external input setting, press up/down, and when "Zero" is displayed, press the Enter key to set the external input function to zero adjustment.

**Laser control**

In the external input setting interface, press up/down, and when "Laser Control" is displayed, press the Enter key to set the external input function as laser control.

**Restoration**

In the interface of external input setting, press up/down, and when "Restoration" is displayed, press the Enter key to set the external input function to reset.

**RS485 Baudrate**

Enter the main menu, press up/down switching option. When "Baudrate" is displayed, press the Enter key to select this option and enter the RS485 baud rate setting.

In the baud rate setting interface, press up/down to adjust the baud rate, and long press Enter key 3s to set the baud rate.

**RS485 Addr**

Enter the main menu, press the up/down switching option, and when "Addr" is displayed, press the Enter key to select this option to enter the RS485 address setting.

In the RS485 address setting interface, press up/down to adjust the address, and press Enter to set the address.

**Laser Statue**

Enter the main menu, press the up/down switching option, and when "Laser Statue" is displayed, press the Enter key to select this option to enter the laser state setting interface.

**Off**

In the laser status setting interface, press up/down, and when "Off" is displayed, press the Enter key to turn off the laser.

**On**

In the laser status setting interface, press up/down, and when "On" is displayed, press the Enter key to turn on the laser.

**ECO**

Enter the main menu, press the up/down switching option. When "ECO" is displayed, press the Enter key to select this option and enter the ECO setting interface.

**Off**

In the ECO setting interface, press up/down, and when "Off" is displayed, press the Enter key to close the ECO mode.

**On**

In the ECO setting interface, press up/down, and when "On" is displayed, press the Enter key to open the ECO mode.

**显示模式**

进入主菜单, 按上翻/下翻切换选项, 显示“显示模式”时, 按确认键选中该选项, 进入显示模式设置界面。

**距离**

在显示模式设置界面, 按上翻/下翻, 显示“距离”时, 按确认键设置显示模式为距离模式。

**位移**

在显示模式设置界面, 按上翻/下翻, 显示“位移”时, 按确认键设置显示模式为位移模式。

**反转**

在显示模式设置界面, 按上翻/下翻, 显示“反转”时, 按确认键设置显示模式为反转模式。

**测量模式**

进入主菜单, 按上翻/下翻切换选项, 显示“测量模式”时, 按确认键选中该选项, 进入测量模式设置界面。

**常规**

在测量模式设置界面, 按上翻/下翻, 显示“常规”时, 按确认键设置测量模式为常规模式。

**峰值**

在测量模式设置界面, 按上翻/下翻, 显示“峰值”时, 按确认键设置测量模式为峰值模式。

**谷值**

在测量模式设置界面, 按上翻/下翻, 显示“谷值”时, 按确认键设置测量模式为谷值模式。

**峰峰值**

在测量模式设置界面, 按上翻/下翻, 显示“峰峰值”时, 按确认键设置测量模式为峰峰值模式。

**外部输入**

进入主菜单, 按上翻/下翻切换选项, 显示“外部输入”时, 按确认键选中该选项, 进入外部输入设置界面。

**关闭**

在外部输入设置界面, 按上翻/下翻, 显示“关闭”时, 按确认键关闭外部输入功能。

**归零**

在外部输入设置界面, 按上翻/下翻, 显示“归零”时, 按确认键设置外部输入功能为归零。

**激光**

在外部输入设置界面, 按上翻/下翻, 显示“激光”时, 按确认键设置外部输入功能为激光控制。

**复位**

在外部输入设置界面, 按上翻/下翻, 显示“复位”时, 按确认键设置外部输入功能为复位。

**RS485 波特率**

进入主菜单, 按上翻/下翻切换选项, 显示“波特率”时, 按确认键选中该选项, 进入波特率设置界面。

在波特率设置界面, 按上翻/下翻, 调整波特率, 长按确认键3s设置波特率。

**RS485 地址**

进入主菜单, 按上翻/下翻切换选项, 显示“地址”时, 按确认键选中该选项, 进入地址设置界面。

在地址设置界面, 按上翻/下翻, 调整地址, 按确认键设置地址。

**激光状态**

进入主菜单, 按上翻/下翻切换选项, 显示“激光状态”时, 按确认键选中该选项, 进入激光状态设置界面。

**关**

在激光状态设置界面, 按上翻/下翻, 显示“关”时, 按确认键关闭激光。

**开**

在激光状态设置界面, 按上翻/下翻, 显示“开”时, 按确认键开启激光。

**ECO**

进入主菜单, 按上翻/下翻切换选项, 显示“ECO”时, 按确认键选中该选项, 进入 ECO 设置界面。

**关**

在 ECO 设置界面, 按上翻/下翻, 显示“关”时, 按确认键关闭 ECO 模式。

**开**

在 ECO 设置界面, 按上翻/下翻, 显示“开”时, 按确认键开启 ECO 模式。

**语言**

进入主菜单, 按上翻/下翻切换选项, 显示“语言”时, 按确认键选中该选项, 进入语言设置界面。

**中文**

在语言设置界面, 按上翻/下翻, 显示“中文”时, 按确认键为中文菜单。

**English**

在语言设置界面, 按上翻/下翻, 显示“English”时, 按确认键为英文菜单。

**恢复出厂**

进入主菜单, 按上翻/下翻切换选项, 显示“恢复出厂”时, 按确认键选中该选项, 进入恢复出厂设置界面。

在恢复出厂设置界面, 按上翻/下翻, 显示“是”时, 按确认键将所有参数恢复出厂。

**Modbus通信说明****基本信息 (默认)**

波特率: 115200bps, 8位数据位, 1位起始位, 1位停止位, 无奇偶校验。

默认输出方式: 被动(Poll)

默认地址: 0x01

帧接收超时时间: 1个字节的传输时间的3.5倍。

注: 更改参数后需发“保存配置”命令。

**Modbus通信交互指令格式**

以默认地址0x01为例说明指令格式

1) 读取寄存器的指令格式如下:

地址	功能码	寄存器地址		寄存器数量		CRC_L	CRC_H
01	03	00	00	00	01	xx	xx

2) 读取寄存器的设备应答包格式:

地址	功能码	数据字节长度	距离值高位	距离值低位	CRC_L	CRC_H
01	03	02	xx	xx	xx	xx

3) 读取寄存器指令错误或设备内部出错的设备应答格式:

地址	功能码	数据字节长度	错误码高位	错误码低位	CRC_L	CRC_H
01	83	02	00	xx	xx	xx

4) 写入单个寄存器数值的指令格式如下:

地址	功能码	寄存器地址		数据 高位	数据 低位	CRC_L	CRC_H
01	06	xx	xx	xx	xx	xx	xx

5) 写入单个寄存器操作设备端处理正确的应答格式:

应答数据包与下发数据包相同。

6) 写入单个寄存器操作设备端处理异常的应答格式:

地址	功能码	数据字节长度	错误码高位	错误码低位	CRC_L	CRC_H
01	86	02	00	xx	xx	xx



7)写入多个寄存器数值的指令格式如下(仅只支持校准寄存器):

地址	功能码	起始地址	寄存器数量 N	字节数	寄存器值	CRC_L	CRC_H
01	10	00 91	00	02	2xN	Nx2	xx xx

8)写入多个寄存器操作设备端处理正确的应答格式:  
应答数据包与下发数据包相同。

9)写入多个寄存器操作设备端处理异常的应答格式:

地址	功能码	数据字节长度	错误码高位	错误码低位	CRC_L	CRC_H
01	10	02	00	xx	xx	xx

#### 字段说明

1)地址:设备地址,默认0x01

2)功能码: 03——读寄存器

83——读寄存器异常应答

10——写多个寄存器

06——写寄存器

86——写寄存器异常应答

90——写多个寄存器异常应答

3)寄存器地址:所有寄存器都为16bit寄存器,所有寄存器修改后必须发送“保存配置”指令且重新上电设备才生效。寄存器说明见表1。

表1 寄存器说明

寄存器地址	定义	说明	权限	取值范围
0x00 00	距离值 低 16 位	传感器的输出结果, 对于此传感器为距离值, 单位: 分辨率	只读	有符号 int 型数据 [-最大量程 ,+最大量程 ]
0x 00 01	距离值高 16 位			
0x 00 02	分辨率	传感器分辨率	只读	0- 1mm; 1- 0.1mm; 2- 0.01mm; 3- 0.001mm; 4- 0.0001mm
0x 00 03	开关量 CH1 输出状态		只读	0- 断开 1- 导通
0x 00 04	开关量 CH2 输出状态		只读	0-断开 1-导通
0x 00 06	MCU 版本号	格式为 V1.01.1。 主版本功能版修订版本	只读	0x1000~0x9999
0x 00 07	FPGA 版本号		只读	0x1000~0x9999
0x 00 08	受光量对应像素点		只读	1~CMOS 像素个数 注:每读取一次, 值自加一
0x 00 09	受光量		只读	0~4095
0x00 0A	快门时间		只读	1~65535 (us)
0x 00 10	滤波 模式		读写	0- 平均移动, 默认值 1- 低通滤波 2- 高通滤波
0x 00 11	平均移动滤波点数		读写	1~1024
0x 00 12	中值滤波	中值滤波器四种选择模式	读写	-0 OFF, 默认值 -7 点 -15 点 -31 点
0x 00 13	工作模式设定	设置传感器工作在正反射或者扩散反射模式, 默认扩散反射模式	读写	-0 正反射 -1 扩散反射
0x 00 14	采样周期设定		读写	-128us 默认值 -200us; -500us; -1ms; -5ms

Table 1 Register Description

Register address	definition	explain	limit of authority	Value range
0x00 00	Distance value is 16 bits lower.	The output result of the sensor is the distance value for this sensor, and the unit is resolution.	read only	Signed int data [-Maximum range,+Maximum range]
0x 00 01	The distance value is 16 bits higher.			
0x 00 02	resolution ratio	Sensor resolution	read only	0- 1mm; 1- 0.1mm; 2- 0.01mm; 3- 0.001mm; 4- 0.0001mm
0x 00 03	Switch CH1 output state		read only	0- disconnect 1- breakover
0x 00 04	Switch CH2 output state		read only	0- disconnect 1- conduction
0x 00 06	MCU version number	The format is V1.01.1 Major version, functional version and revised version	read only	0x1000~0x9999
0x 00 07	FPGA version number		read only	0x1000~0x9999
0x 00 08	The amount of light received corresponds to the pixel point.		read only	1~CMOS pixel number Note: The value will be increased by one each time it is read.
0x 00 09	Light receiving capacity		read only	0~4095
0x00 0A	Shutter time		read only	1~65535 (us)
0x 00 10	Filtering mode		read and write	0- Average moving, default value 1- low pass filtering 2- Qualcomm filtering
0x 00 11	Average moving filter points		read and write	1~1024
0x 00 12	median filtering	Four selection modes of median filter	read and write	-0 OFF, default value -7 o'clock -15 o'clock -31 o'clock
0x 00 13	Working mode setting	Set the sensor to work in normal reflection or diffuse reflection mode, and default diffuse reflection mode.	read and write	-0 positive reflection -1 diffuse reflection
0x 00 14	Sampling period setting		read and write	-128us default value -200us ; -500us ; -1ms ; -5ms
0x 00 15	Shutter time setting value		read and write	0- Automatic, default value Integer from 1 to 1~65535(us)

Register address	definition	explain	limit of authority	Value range
0x 00 16	Peak recognition sensitivity	Set the value of the recognizable signal.	read and write	The numerical range is initially set at 100 ~ 4096, and the specific values are set according to optics.
0x 00 17	Measurement range designation a	Specify the effective measurement range on CMOS	read and write	Numerical range: 1 ~ CMOS maximum pixel, integer. Default value 1
0x 00 18	Measurement range designation b		read and write	Numerical range: 1 ~ CMOS maximum pixel, integer. Default CMOS maximum pixel point
0x 00 19	Laser state		read and write	0- Disabled 1- enabled
0x 00 1B	CH1 teaches that the threshold is 16 bits lower.	Teach the threshold	read and write	Less than the teaching threshold
0x 00 1C	CH1 teaches that the threshold is 16 bits higher.			
0x 00 1D	CH1 teaches that the upper threshold is 16 bits lower.	Teaching upper threshold	read and write	Less than maximum range
0x 00 1E	CH1 teaches that the upper threshold is 16 bits high.			
0x 00 1F	CH1 teaching mode	Teaching mode	read and write	0- Normal teaching mode 1- 1-point teaching mode 2- 2-point teaching mode 3- Three-point teaching mode 4- Midpoint teaching mode
0x 00 20	CH2 teaches that the threshold is 16 bits lower.	Teach the threshold	read and write	Less than the teaching threshold
0x 00 21	CH2 teaches that the threshold is 16 bits higher.			
0x 00 22	CH2 teaches that the upper threshold is 16 bits lower.	Teaching upper threshold	read and write	Less than maximum range
0x 00 23	CH2 teaches that the upper threshold is 16 bits high.			
0x 00 24	CH2 teaching model	Teaching mode	read and write	5- Normal teaching mode 6- 1-point teaching mode 7- 2-point teaching mode 8- Three-point teaching mode 9- Midpoint teaching mode
0x 00 25	Output save time		read and write	Unit ms
0x 00 26	Switch CH1 output mode	On/off state	read and write	0- Liangtong 1- Dark pass

寄存器地址	定义	说明	权限	取值范围
0x 00 15	快门时间设置值		读写	0-自动, 默认值 1~65535 (us) 整数
0x 00 16	峰值识别灵敏度	设置可识别信号的值	读写	数值范围初定 100~4096 具体数值根据光学设定
0x 00 17	测量范围指定 a	指定 CMOS 上有效测量范围	读写	数值范围: 1~CMOS最大像素, 整数。默认值 1
0x 00 18	测量范围指定 b		读写	数值范围: 1~CMOS最大像素, 整数。默认值 CMOS最大像素点
0x 00 19	激光状态		读写	0-失能 1-使能
0x 00 1B	CH1 教导下阈值低 16 位	教导下阈值	读写	小于教导上阈值
0x 00 1C	CH1 教导下阈值高 16 位			
0x 00 1D	CH1 教导上阈值低 16 位	教导上阈值	读写	小于最大量程
0x 00 1E	CH1 教导上阈值高 16 位			
0x 00 1F	CH1 教导模式	教导模式	读写	0- 通常教导模式 1- 1 点教导模式 2- 2 点教导模式 3- 3 点教导模式 4- 中点教导模式
0x 00 20	CH2 教导下阈值低 16 位	教导下阈值	读写	小于教导上阈值
0x 00 21	CH2 教导下阈值高 16 位			
0x 00 22	CH2 教导上阈值低 16 位	教导上阈值	读写	小于最大量程
0x 00 23	CH2 教导上阈值高 16 位			
0x 00 24	CH2 教导模式	教导模式	读写	5- 通常教导模式 6- 1 点教导模式 7- 2 点教导模式 8- 3 点教导模式 9- 中点教导模式
0x 00 25	输出保存时间		读写	单位 ms
0x 00 26	开关量 CH1 输出模式	亮/暗通状态	读写	0- 亮通 1- 暗通

寄存器地址	定义	说明	权限	取值范围	
0x 00 27	开关量 CH2 输出模式	亮/暗通状态	读写	0-亮通 1-暗通	
0x 00 28	开关量 CH1 输出类型		读写	0- NPN 1- PNP 2- 推挽	
0x 00 29	开关量 CH2 输出类型		读写	0- NPN 1- PNP 2- 推挽	
0x 00 2A	输出回差		读写	单位同测量值单位	
0x 00 2B	显示模式		读写	0- 位移模式 1- 反向位移模式 2- 距离模式	
0x 00 2C	ECO 模式		读写	0-失能 1-使能	
0x 00 2E	测量模式	测量模式设定	读写	0-常规模式, 默认值 1-峰值模式 2-谷值模式 3-峰峰值模式	
0x 00 2F	判断输出 OFF 延时	判断输出 OFF 延时时间选择	读写	-0, 不延时, 默认值 -2ms; -4ms; -10ms; -20ms; -40ms; -100ms	
0x 00 30	线性调整	可将模拟电流输出和模拟电压输出线性调整于任意区间	读写	测量范围	
0x 00 31			测定值 A 低 16 位	读写	
0x 00 32			测定值 A 高 16 位	读写	测量范围
0x 00 33			测定值 B 低 16 位	读写	
0x 00 34			测定值 B 高 16 位	读写	
0x 00 35			电流 a	读写	默认值 4, 取值范围: 4~20 整数
0x 00 36			电流 b	读写	默认值 20, 取值范围: 4~20 整数
0x 00 37			电压 a	读写	默认值 0, 取值范围: 0~10 整数
0x 00 38			电压 b	读写	默认值 10, 取值范围: 0~10 整数
0x 00 38	模拟选择		读写	0-电压模式, 默认值 1-电流模式	
0x 00 39	数字警告		读写	0-固定值, 最大量程值 1-保持警告时测量值	

Register address	definition		explain	limit of authority	Value range	
0x 00 27	Switch CH2 output mode		On/off state	read and write	0- bright pass 1- dark pass	
0x 00 28	Switch CH1 output type			read and write	0- NPN 1- PNP 2- push-pull	
0x 00 29	Switch CH2 output type			read and write	0- NPN 1- PNP 2- push-pull	
0x 00 2A	Output return difference			read and write	The unit is the same as the measured unit.	
0x 00 2B	display mode			read and write	0- Displacement mode 1- Reverse displacement mode 2- Distance mode	
0x 00 2C	ECO mode			read and write	0- Disabled 1- enabled	
0x 00 2E	Measurement mode		Measurement mode setting	read and write	0- Normal mode, default value 1- peak mode 2- valley mode 3- peak-peak mode	
0x 00 2F	Judging the output OFF delay		Judge the output OFF delay time selection.	read and write	-0, no delay, default value -2ms ; -4ms ; -10ms ; -20ms ; -40ms ; -100ms	
0x 00 30	Linear adjustment	The measured value A is 16 bits lower.	The analog current output and analog voltage output can be linearly adjusted in any interval.	read and write	measuring range	
0x 00 31		The measured value A is 16 digits higher.		read and write		
0x 00 32		Measured value b is 16 bits lower.		read and write		
0x 00 33		Measured value b is 16 digits higher.		read and write		
0x 00 34		Current a		read and write		The default value is 4, and the value range is 4~20 integers.
0x 00 35		Current b		read and write		The default value is 20, and the value range is an integer from 4 to 20.
0x 00 36		Voltage a		read and write		The default value is 0, and the value range is 0~10 integers.
0x 00 37		Voltage b		read and write		The default value is 10, and the value range is an integer from 0 to 10.

Register address	definition	explain	limit of authority	Value range
0x 00 38	Analog selection		read and write	0- voltage mode, default value 1- Current mode
0x 00 39	Digital warning		read and write	0- fixed value, maximum range value 1- Keep the measured value when warning.
0x 00 3A	Analog warning		read and write	0- fixed value, 11V in voltage mode and 0mA in current mode when warning occurs. 1- Keep the measured value when warning.
0x 00 3B	Warning delay times	Warning delay times	read and write	The numerical range is initially 0 ~ 65534, and the default value is 0.
0x 00 3C	zero	The position of the current detection distance of the detection head is 0. When it is reset, zero adjustment will be cancelled.	read and write	1- Zero adjustment enabled 0- zero OFF, the default value
0x 00 3D	Zero offset low 16 bits	The center position of the detection distance of the detection head is 0 point. In the case of extraordinary scale, reset and hold the measured value.	read and write	measuring range
0x 00 3E	Zero bias high 16 bits		write only	1- Reset Enabled
0x 00 3F	Measured value reset			
0x 00 40	Timing input		read and write	0- keep 1- One-time action
0x 00 80	Save configuration		write only	0
0x 00 84	Baud rate High	Configure the baud rate. Restart to take effect after sending the save configuration instruction. Only 2400, 4800, 9600, 19200, 38400 and 115200 are supported for the time being.	read and write	0 or 1
0x 00 83	Baud rate Low		read and write	2400、4800、9600、19200、38400、49664
0x 00 85	Device ID	Configure the device address, the default value is 0x01, which is valid after saving and restarting.	read and write	1~247

寄存器地址	定义	说明	权限	取值范围
0x 00 3A	模拟警告		读写	0-固定值, 发生警告时电压模式输出 11V, 电流模式输出 0mA 1-保持警告时测量值
0x 00 3B	警告延时次数	警告延迟次数	读写	数值范围初定 0~65534, 默认值 0
0x 00 3C	调零	检测头当前检测距离的位置为 0, 复位时, 解除调零	读写	1-调零使能 0-调零 OFF, 默认值
0x 00 3D	调零偏置低 16 位		读写	测量范围
0x 00 3E	调零偏置高 16 位			
0x 00 3F	测定值复位	检测头检测距离的中心位置为 0 点。非常规模式下, 复位保持的测量值	只写	1-复位使能
0x 00 40	定时输入		读写	0- 保持 1- 一次性动作
0x 00 80	保存配置		只写	0
0x 00 84	波特率 High	配置波特率。发送保存配置指令后重启生效。暂仅支持 2400、4800、9600、19200、38400、115200	读写	0 或 1
0x 00 83	波特率 Low		读写	2400、4800、9600、19200、38400、49664
0x 00 85	设备 ID	配置设备地址, 默认 0x01, 保存后重启有效	读写	1~247
0x 00 86	奇偶校验	校验位设置	读写	0- 无校验 1- 奇校验 2- 偶校验
0x 00 87	工作模式	配置设备的工作模式	读写	0-为连续发送模式 1-为查询模式 (默认)
0x 00 89	恢复出厂设置		只写	0
0x 00 90	距离校准控制	校准控制	只写	0- 退出校准 1- 开始校准 2- 完成校准

寄存器地址	定义	说明	权限	取值范围
0x00 91	校准距离 值低 16 位	传感器的输出结果, 对于此传感器为距离值, 单位: 分辨率	只写	有符号 int 型数据 [-最大量程 ,+最大量程 ] 注: 收到开始校准命令, 需按由近到远的顺序移动标靶并发送标靶位置, 全部点位校准完成, 发送完成校准命令 (保存校准数据), 如果不想使用此次校准数据, 可直接发送未完成退出校准命令。
0x 00 92	校准距离值高 16 位			
0x 10 00	像素点 1 受光量		只读	0~4095
0x 13 FF	像素点 1024 受光量		只读	0~4095

## 4)寄存器数量:

读取寄存器指令中, 预读取的寄存器的数量。取值1~8。

## 5)数据字节长度:

读取寄存器指令应答中, 表示应答数据段的字节个数。

## 6)错误码:

读写寄存器时下发指令格式错误或设备内部处理异常时, 设备应答包中数据段为错误码。错误码含义如表2。

表2 错误码说明

错误码	说明
0x0001	寄存器地址错误
0x0002	寄存器写入值错误

## 7) CRC校验:

协议中一帧报文携带两个字节的CRC校验码, 为CRC16校验, 报文倒数第二字节为校验码低字节, 报文倒数第一字节为校验码高字节。

参数模型:  $x^{16} + x^{15} + x^2 + 1$

多项式: 0x8005

初始值: 0xFFFF

Register address	definition	explain	limit of authority	Value range
0x 00 86	Parity check	Check bit setting	read and write	0- No parity 1- odd 2- even parity check
0x 00 87	work pattern	Configure the working mode of the device.	read and write	0- continuous transmission mode. 1- Query mode (default)
0x 00 89	Restore factory settings		write only	0
0x 00 90	Distance calibration control	Calibration control	write only	0- Exit calibration 1- Start calibration 2- Complete calibration
0x00 91	Calibration distance value Lower 16 bits	The output result of the sensor is the distance value for this sensor, and the unit is resolution.	write only	Signed int data [-Maximum range,+Maximum range] Note: After receiving the start calibration command, you need to move the target from near to far and send the target position. When all points are calibrated, send the completion calibration command (save the calibration data). If you don't want to use the calibration data, you can directly send the unfinished exit calibration command.
0x 00 92	Calibration distance value High 16 bits			
0x 10 00	Light receiving amount of pixel point 1		read only	0~4095
0x 13 FF	The amount of light received by the pixel 1024		read only	0~4095

4)Number of registers:

The number of pre-read registers in the read register instruction. Values are 1~8.

5)Data byte length:

The number of bytes in the response of the read register instruction, indicating the response data segment.

6)Error code:

When reading and writing registers, the format of the instruction issued is wrong or the internal processing of the device is abnormal, the data segment in the device response packet is an error code. The meaning of the error code is shown in Table 2 below.

Table 2 Error Code Description

Error code	Explain
0x0001	Register address error
0x0002	Error in writing register value.

7)CRC check:

In the protocol, a frame message carries two bytes of CRC check code, which is CRC16 check, the penultimate byte of the message is the low byte of check code, and the penultimate byte of the message is the high byte of check code.

Parameter model: x16+x15+x2+1

Polynomial: 0x8005

Initial value: 0xFFFF

Interactive information example

Function	Instruction	Successful return value	Explain
obtain Distance value	01 03 00 00 00 01 84 0A	01 03 02 DH DL CL CH	DH and DL are 8 bits higher and 8 bits lower than the measured value of the sensor, respectively. CH and CL are the low 8bit and high 8bit of CRC respectively.
	01 03 00 00 00 02 C4 0B	01 03 04 D3 D4 D1 D2 CL CH	0xD1D2D3D4 times the sensor resolution is the sensor measurement value.
obtain version number	01 03 00 06 00 02 24 0A	01 03 04 00 VM VS VC CL CH	VM, VS and VC are the major, minor and revised version numbers of the version respectively.
set up Baud rate	01 06 00 83 BH1 BH2 CL CH 01 06 00 84 BL1 BL2 CL CH	01 06 00 83 BH1 BH2 CL CH 01 06 00 84 BL1 BL2 CL CH	BH1, BH2, BL1 and BL2 are the high, second high, second low and low bytes of baud rate respectively. For example, modify the baud rate to 9600, bh1 = 00bh2 = 00cl = 78ch = 22, bl1 = 25bl2 = 80cl = d2ch = D3.
modify Device ID	01 06 00 85 IH IL CL CH	01 06 00 85 IH IL CL CH	IH,IL are the high byte and low byte of ID, and 1 ~247, 0x00 is the broadcast address. Modify ID to 2, IH=00 IL=02 CL=19 CH=E2.
Modify parity bit	01 06 00 86 00 01 CL CH	01 06 00 86 00 01 CL CH	Set to odd parity
modify Equipment mode	01 06 00 87 00 M CL CH	01 06 00 87 00 M CL CH	M is the instruction byte of device mode. M=00 is continuous transmission mode (default) M=01 is the query mode.
Save configuration	01 06 00 80 00 00 88 22	01 06 00 80 00 00 88 22	Save and restart to take effect.
recover Factory settings	01 06 00 89 00 00 58 20	01 06 00 89 00 00 58 20	After saving, it will be restarted to take effect, and the ID address and baud rate of the device will be reset to the factory status.

## 交互信息示例

功能	指令	成功返回值	说明
获取距离值	01 03 00 00 00 01 84 0A	01 03 02 DH DL CL CH	DH、DL 分别是传感器测量值低 16 位的高 8bit 和低 8bit；CH、CL 分别为 CRC 的低 8bit 和高 8bit
	01 03 00 00 00 0 2 C4 0B	01 03 0 4 D3 D4 D1 D2 CL CH	0xD1D2D3D4 乘以传感器分辨率为传感器测量值
获取版本号	01 03 00 06 00 02 24 0A	01 03 04 00 VM VS VC CL CH	VM,VS,VC 分别是版本的主、次、修正版本号
设置波特率	01 06 00 83 BH1 BH2 CL CH 01 06 00 84 BL1 BL2 CL CH	01 06 00 83 BH1 BH2 CL CH 01 06 00 84 BL1 BL2 CL CH	BH1,BH2,BL1,BL2分别为波特率的高,次高,次低,低字节。例如修改波特率为9600, BH1=00 BH2=00 CL=78 CH=22,BL1=25 BL2=80 CL=D2 CH=D3
修改设备 ID	01 06 00 85 IH IL CL CH	01 06 00 8 5 IH IL CL CH	IH,IL 为 ID 的高字节和低字节, 1-247, 0x00 为广播地址。修改 ID 为 2, IH=00 IL=02 CL=19 CH=E2
修改奇偶校验位	01 06 00 8 6 00 01 CL CH	01 06 00 8 6 00 01 CL CH	设置成奇校验
修改设备模式	01 06 00 8 7 00 M CL CH	01 06 00 8 7 00 M CL CH	M 为设备模式的指令字节 M=00 为连续发送模式(默认) M=01 为查询模式
保存配置	01 06 00 80 00 00 88 22	01 06 00 80 00 00 88 22	保存后重启生效
恢复出厂设置	01 06 00 89 00 00 58 20	01 06 00 89 00 00 58 20	保存后重启生效, 设备的 ID 地址和波特率重置为出厂状态