

Product Description

- The compact body meets the needs of electronics, photovoltaic, semiconductor and other industries for compact space.
- The blind area is small, with excellent black-and-white detection characteristics, which can stably detect objects of different colors.

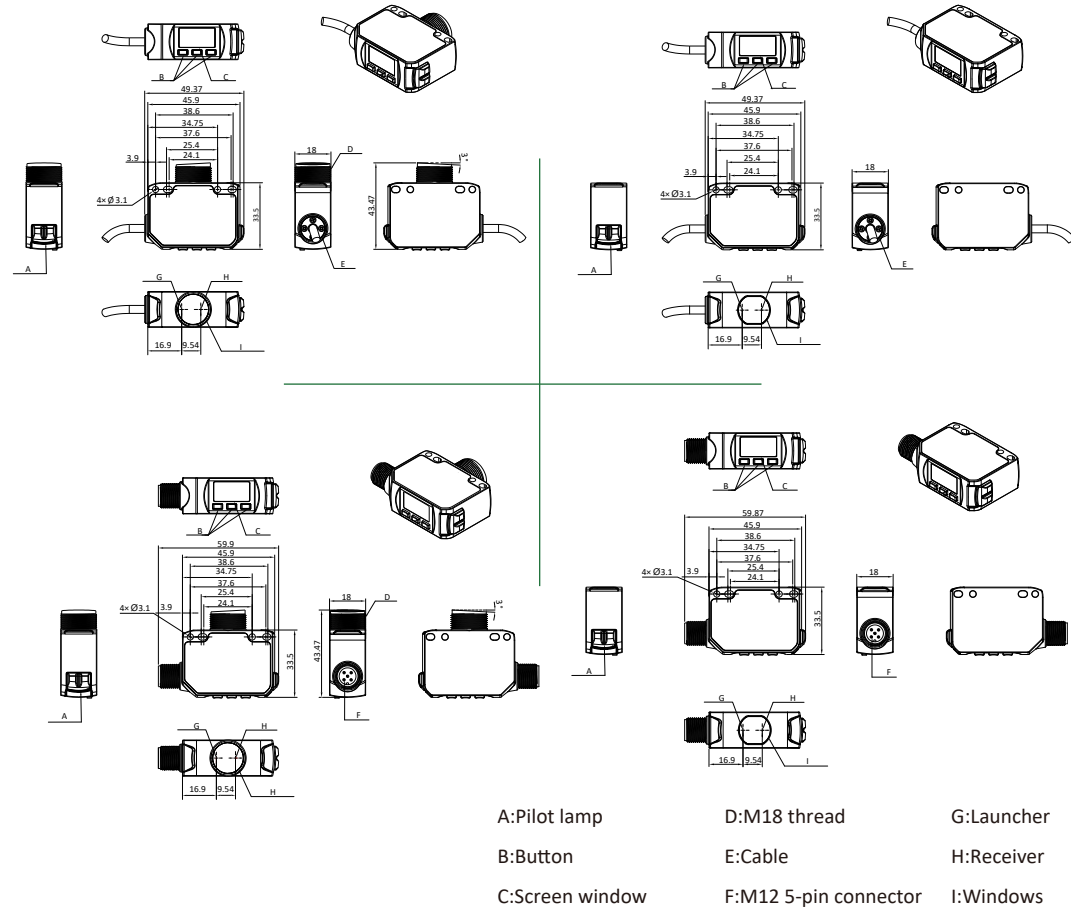


Type	Measurement range	Light source	Output mode	Installation method	Connection method	Wiring diagram
OSM45-KL300CB6/485	25...300mm	Red laser	NPN/PNP+RS485	Flush	2M cable	Fig.1
OSM45-KL310CB6/485	35...310mm	Red laser	NPN/PNP+RS485	Non-flush		
OSM45-KL300CB6Q12.1/485	25...300mm	Red laser	NPN/PNP+RS485	Flush	M12 5-pin connector	Fig.2
OSM45-KL310CB6Q12.1/485	35...310mm	Red laser	NPN/PNP+RS485	Non-flush		
OSM45-KL500CB6/485	25...500mm	Red laser	NPN/PNP+RS485	Flush	2M cable	Fig.1
OSM45-KL510CB6/485	35...510mm	Red laser	NPN/PNP+RS485	Non-flush		
OSM45-KL500CB6Q12.1/485	25...500mm	Red laser	NPN/PNP+RS485	Flush	M12 5-pin connector	Fig.2
OSM45-KL510CB6Q12.1/485	35...510mm	Red laser	NPN/PNP+RS485	Non-flush		

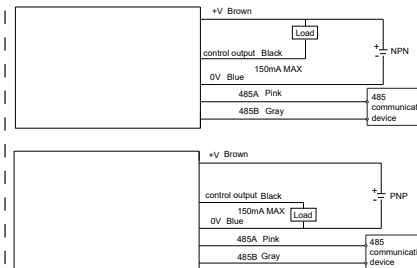
TECHNICAL SPECIFICATION

OPERATING VOLTAGE	10...30VDC	WORKING TEMPERATURE	-10°C ... +50°C
LIGHT SOURCE TYPE	OSM45-KL300/KL310 633nm,class 1 OSM45-KL500/KL510 655nm,class 1	STORAGE TEMPERATURE	-20°C ... +60°C
SPOT SIZE	1*2mm@300mm 1.5*3mm@500mm	PROTECTION CIRCUIT	Short circuit protection Anti-polarity protection Output overload protection
SWITCH MODE	NPN/PNP/ Push-pull can be switched.	PROTECTION DEGREE	IP67
POWER SUPPLY	≤1W	HOUSING MATERIAL	Zinc alloy
LOAD CURRENT	≤100mA	TEMPERATURE DRIFT	≤0.15%F.S./°C
SWITCHING FREQUENCY	≥ 400HZ (MAX)	LIGHT INTERFERENCE	> 5000lux
DISTANCE ADJUSTMENT	Keys to teach (Single point/window)	EMC	Voltage impact: ±1.0KV, 0.5J EFT: ±2KV, <1ms ESD: air discharge: ±8KV, 10 times contact discharge: ±4KV, 10 times Insulation test: IS1mA, U=650VAC, 10s
MEASUREMENT PRECISION	Repeatability 1mm(25mm~100mm) 3mm(100mm~300mm) 5mm(300mm~510mm)		

DIMENSIONS



INTERFACE DEFINITION AND WIRING DIAGRAM



	Function	Cabel core color	Connector core color
1	Positive power supply	Brown	Brown
2	485B	Gray	White
3	Power negative	Blue	Blue
4	NPN/PNP	Black	Black
5	485A	Pink	Gray

Connector wiring diagram

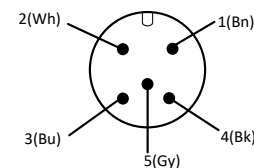


Fig.1

Fig.2

产品说明

- 小巧机身，满足电子、光伏、半导体等行业对紧凑空间的需求
- 盲区小，具有优良的黑白检测特性，可稳定检测不同颜色被测物。

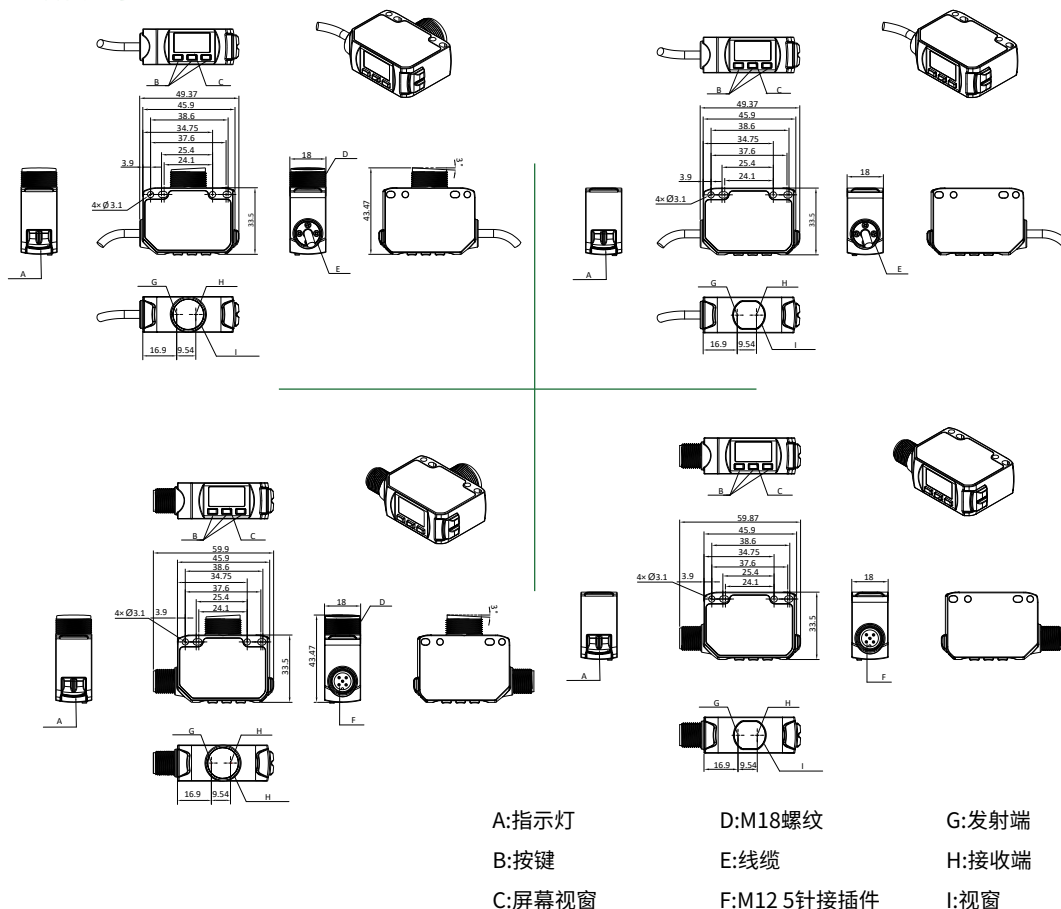


型号	检测距离	光源	输出方式	安装方式	连接方式	接线图
OSM45-KL300CB6/485	25...300mm	红色激光	NPN/PNP+RS485	非齐平	2M 线缆	图1
OSM45-KL310CB6/485	35...310mm	红色激光	NPN/PNP+RS485	齐平	2M 线缆	图1
OSM45-KL300CB6Q12.1/485	25...300mm	红色激光	NPN/PNP+RS485	非齐平	M12 5针接插件	图2
OSM45-KL310CB6Q12.1/485	35...310mm	红色激光	NPN/PNP+RS485	齐平	M12 5针接插件	图2
OSM45-KL500CB6/485	25...500mm	红色激光	NPN/PNP+RS485	非齐平	2M 线缆	图1
OSM45-KL510CB6/485	35...510mm	红色激光	NPN/PNP+RS485	齐平	2M 线缆	图1
OSM45-KL500CB6Q12.1/485	25...500mm	红色激光	NPN/PNP+RS485	非齐平	M12 5针接插件	图2
OSM45-KL510CB6Q12.1/485	35...510mm	红色激光	NPN/PNP+RS485	齐平	M12 5针接插件	图2

技术参数

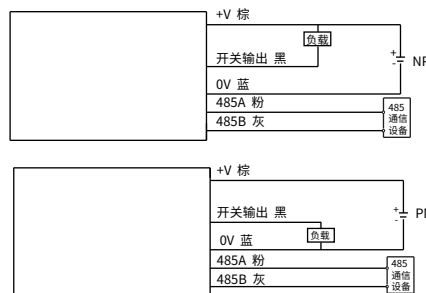
工作电压	10...30VDC	工作温度	-10°C...+50°C
光源类型	OSM45-KL300/KL310 633nm 1级激光 OSM45-KL500/KL510 655nm 1级激光	存储温度	-20°C...+60°C
开关模式	NPN/PNP/推挽可切换	光斑尺寸	1*2mm@300mm 1.5*3mm@500mm
整机功率	≤1W	保护电路	短路保护 反极性保护 输出过载保护
负载电流	≤100mA	防护等级	IP67
开关频率	≥400HZ (MAX)	外壳	锌合金
距离调节	按键示教 (单点/窗口)	温度漂移	≤0.15%F.S./°C
测量精度	重复精度 1mm(25mm-100mm) 3mm(100mm-300mm) 5mm(300mm-510mm)	光干扰	>5000lux
		EMC	电压冲击:±1.0KV,0.5J EFT:±2KV,<1ms ESD:空气放电:±8KV,10次 接触放电:±4KV,10次 绝缘测试:I≤1mA,U=650VAC,10s

外形尺寸



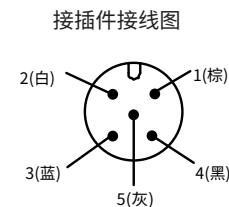
- A: 指示灯
- B: 按键
- C: 屏幕视窗
- D: M18螺纹
- E: 线缆
- F: M12 5针接插件
- G: 发射端
- H: 接收端
- I: 视窗

接口定义和接线图



功能	出线式线芯颜色	接插件式线芯颜色
1 电源正	棕	棕
2 485B	灰	白
3 电源负	蓝	蓝
4 NPN/PNP	黑	黑
5 485A	粉	灰

图一



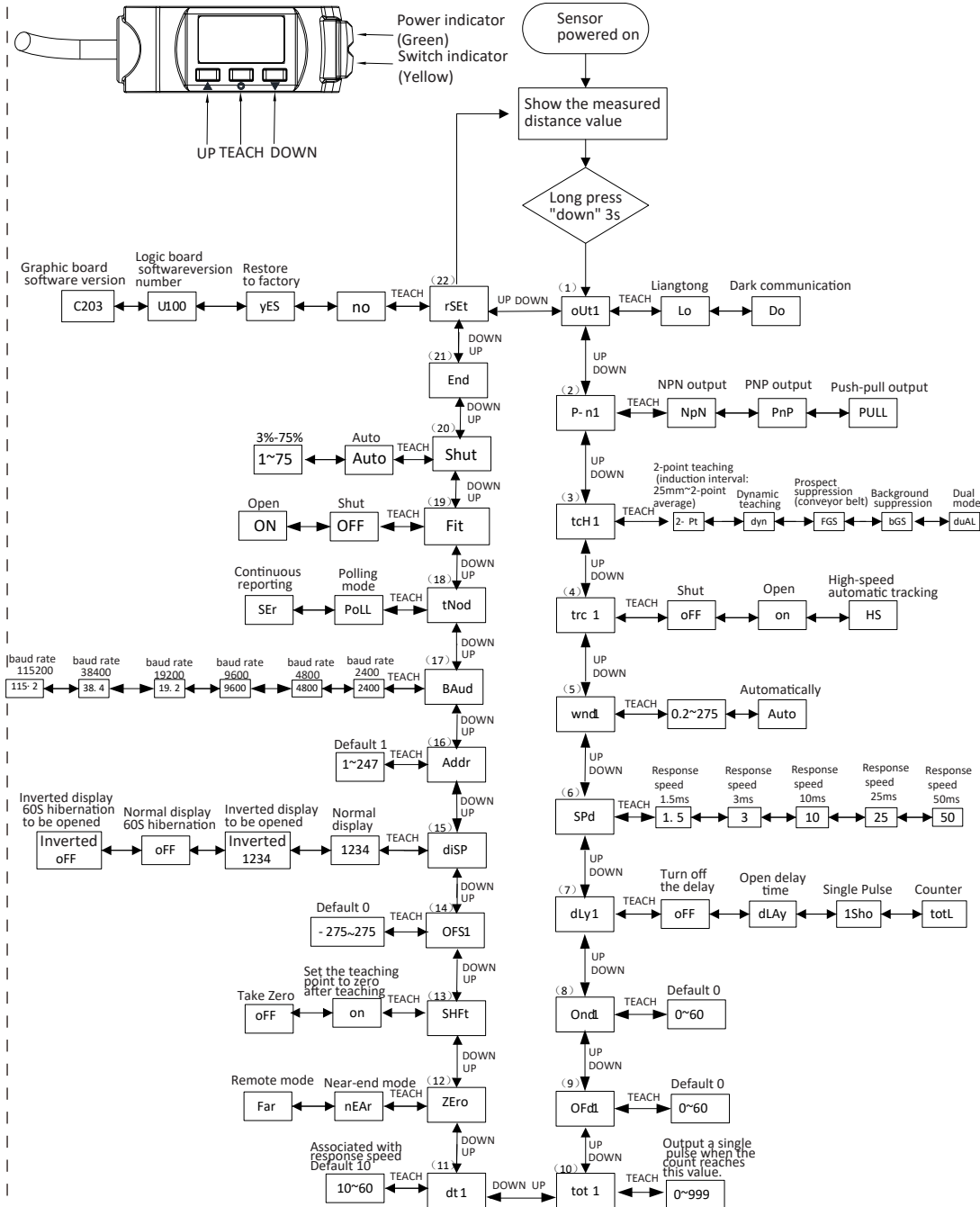
图二

INSTRUCTION

1. At the distance from the interface, press and long press 3s "down button" to enter the menu interface.
2. In the menu interface, short press the "up button" and "down button" to change the parameter items.
3. In the menu interface, short press the "Confirm" to view the parameter value of the corresponding parameter item.
4. When viewing the parameter value of the parameter item, short-click the "up button" and "down key" to change the parameter value, and briefly press the "confirm key" to return to the menu interface.
5. In the menu interface, long press the "Confirm" to save the parameters and return to the display interface.
6. In the menu interface, when the parameter item is "End", short press the "confirm button" to return to the confirmation interface.
7. When distance from the interface, long press the "confirm button" to set the teaching value.
8. When you are away from the interface, short press the "up button" and "down button" to adjust the teaching value.

* Dark background is the corresponding default parameter value.

Show		Explain	Show		Explain
Main menu	Submenu		Main menu	Submenu	
(1) out1	Display value	Measure distance value or match percentage	(9) OFd1	Output OFF delay(displayed only when dLy1 is dLAY)	0~60 Default 0
		Switching CH1 output mode	(10) tot1	Counting number(displayed only when dLy1 is totL)	0~999 Output a single pulse when the count reaches this value.
		Lo Liangtong do Dark communication			
(2) P-n1		Switching amount CH1 output type	(11) dt1	Pulse width(displayed only when dLy1 is ISho/totL)	10~60 Associated with response speed Default 10
		nPn NPN output			
		PnP PNP output	(12) Zero	Near and far-end mode	
		PULL Push-pull output		nEAr Near-end mode	
(3) tch1		Switch volume CH1 teaching mode		Far Remote mode	
		2-Pt 2-point teaching (induction interval: 25mm~2-point average)	(13) ShFt	on Set the teaching point to zero after teaching	
		dyn Dynamic teaching		oFF Take Zero	
		FGS Prospect suppression (conveyor belt)	(14) oFS1	Teaching Point Offset(displayed only when dLy1 is FCS/BCS)	-275~275 Default 0
		bGS Background suppression		1234 Display mode	
		duAL Dual mode		1234 Inverted display to be opened	
(4) trc1		Automatic tracking(displayed only when tch1 is duAL)	(15) diSP	Inverted oFF	Inverted display 60S hibernation to be opened Normal display 60S hibernation
		oFF Shut		oFF	Inverted display to be opened
		on Open	(16) Addr	1~247	Default 1
(5) wnd1		High-speed automatic tracking	(17) bAud	RS485 baud rate	2400/4800/9600/19200/38400/115200
		0.2~275		1.5 Unit :ms	
		Auto Automatically	(18) t.nod	POLL	Polling mode
				Ser	Continuous reporting
				Fit	Anti-light interference
(6) SPd		Response speed	(19) Fit	OFF	Shut
		1.5		ON	Open
		3	(20) Shut	Auto	The space ratio of the shter
		10		1~75	3%~75%
		25		oFF	Turn off the delay
(7) dLy1		Output time delay	(21) End		Exit settings
		oFF		dLAY	Open delay time
		dLAY		1Sho	Single Pulse
		1Sho		totL	Counter
(8) Ond1		Output ON delay(Only displayed when dLy1 is dLAY)	(22) rSET		Restore to factory
		oFF		no	Single Pulse
		1Sho		yES	Restore to factory
(9) OFd1		Output OFF delay		U100	Logic board software version number
		oFF		C203	Graphic board software version
		1Sho			

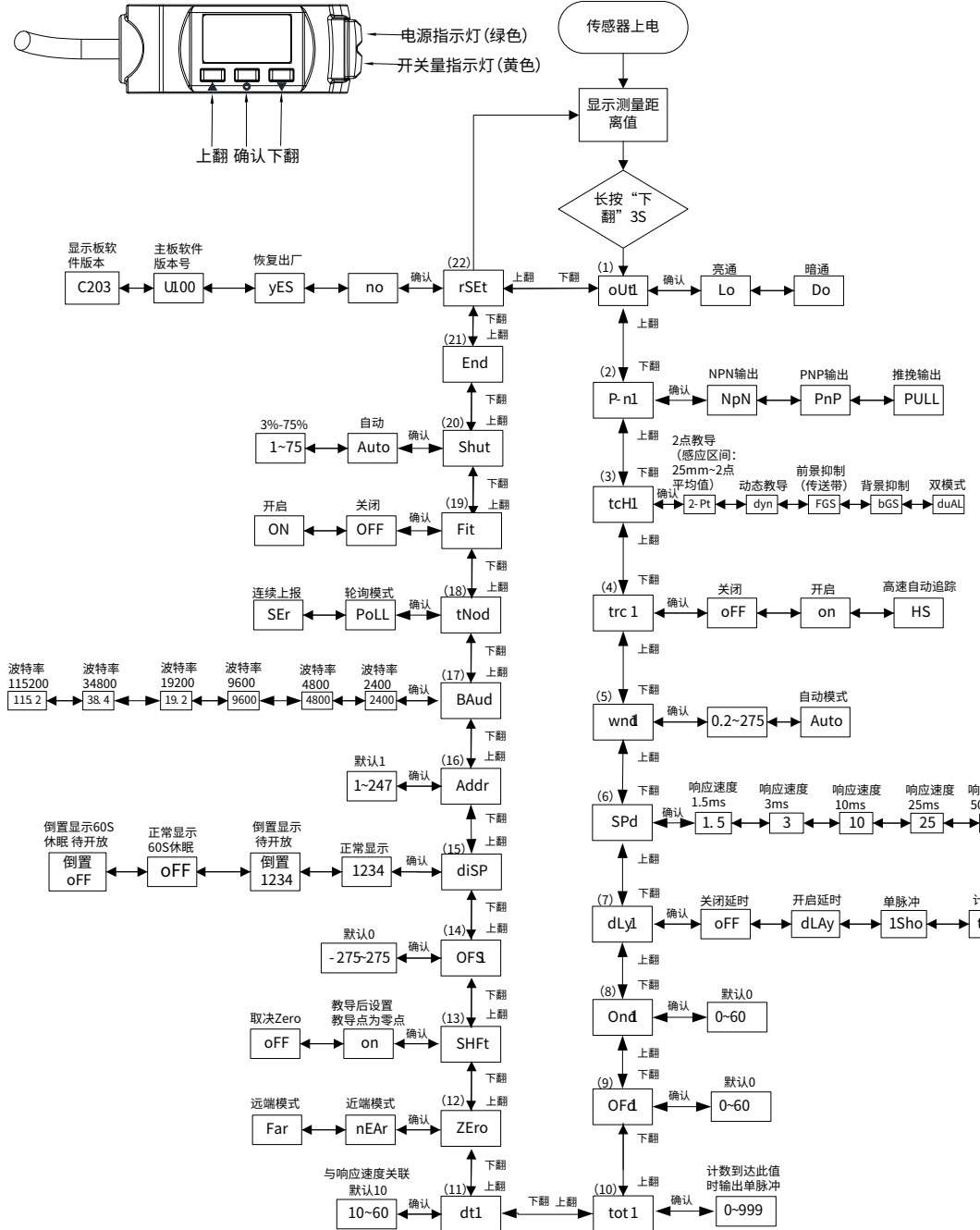


操作指南

1. 距离界面时, 长按3s“下翻键”进入菜单界面。
2. 菜单界面时, 短按“上翻键”“下翻键”进行更改参数项。
3. 菜单界面时, 短按“确认键”查看对应参数项数值。
4. 查看参数项数值时, 短按“上翻键”“下翻键”进行更改参数值, 短按“确认键”返回菜单界面。
5. 菜单界面时, 长按“确认键”保存参数并返回显示界面。
6. 菜单界面时, 参数项为“End”时, 短按“确认键”返回确认界面。
7. 距离界面时, 长按“确认键”进行设置教导值。
8. 距离界面时, 短按“上翻键”“下翻键”进行教导值调整。

*深色背景为对应默认参数值

显示		说明	显示		说明
顶层菜单	子菜单		顶层菜单	子菜单	
显示数值		测量距离值或匹配百分比	(9) OFd1	输出OFF延时(仅DLy1为dLAY时显示)	默认0
(1) out1		开关量CH1输出模式	0~60	计数个数(仅DLy1为totL时显示)	默认0
	Lo	亮通	(10) tot1	计数到达此值时输出单脉冲	0~999
(2) P-n1	do	暗通	(11) dt1	脉冲宽度(仅DLy1为1Sho/totL时显示)	与响应速度关联 默认10
	nPn	NPN输出	10~60	与响应速度关联	默认10
(3) tch1	PnP	PNP输出	(12) Zero	远近端模式	远近端模式
	PULL	推挽输出	nEAr	近端模式	近端模式
		开关量CH1教导模式	Far	远端模式	远端模式
(4) trc1	2-Pt	2点教导 (感应区间: 25mm~2点平均值)	(13) ShFt	零点	零点
	dyn	动态教导	on	教导后设置教导点为零点	教导后设置教导点为零点
	FGS	前景抑制 (传送带)	oFF	取决Zero	取决Zero
	bGS	背景抑制	(14) oFS1	教导点偏移量(仅tch1为FGS/BGS时显示)	默认0
	duAL	双模式	-275~275	默认0	默认0
(5) wnd1		自动追踪 (仅tch1为duAL时显示)	(15) diSP	显示模式	显示模式
	oFF	关闭	1234	正常显示	正常显示
	on	开启	倒置1234	倒置显示 待开放	倒置显示 待开放
	HS	高速自动追踪	oFF	正常显示60S休眠	正常显示60S休眠
(6) SPd		窗口尺寸 (仅tch1为FGS时显示)	(16) Addr	RS485 地址	默认1
	0.2~275	自动模式	1~247	默认1	默认1
(7) dLy1	Auto	自动模式	(17) bAud	RS485 波特率	2400/4800/9600/19200/38400/115200
	1.5	响应速度	(18) t.nod	RS485 上报模式	POLL
	3		Ser	轮询模式	Ser
	10		连续上报	OFF	关闭
	25		抗光干扰	ON	开启
50	快门占比		Auto	自动	
(8) Ond1		输出延时	(19) Fit	关闭	关闭
	oFF	关闭延时	(20) Shut	开启	开启
	dLAY	开启延时	1~75	3%~75%	3%~75%
	1Sho	单脉冲		退出设置	退出设置
(9) OFd1	totL	计数器	(21) End	恢复出厂	恢复出厂
		输出ON延时 (仅DLy1为dLAY时显示)	(22) rSEt	no	恢复出厂
	0~60	默认0	U100	主板软件版本号	U100
		默认0	C203	显示板软件版本	C203



MODBUS COMMUNICATION PROTOCOL

Basic information (default)

Baud rate: 115200bps, 8-bit data bit, 1-bit starting bit, 1-bit stop bit, no parity.

Default output mode: Passive (Poll)

Default address: 0x01

Frame reception timeout: 3.5 times the transmission time of 1 byte.

Modbus communication interactive instruction format

Take the default address 0x01 as an example to illustrate the instruction format.

1) The instruction format for reading registers is as follows:

address	function code	register address		Number of registers		CRC_L	CRC_H
01	03	00	00	00	01	xx	xx

2) Device response packet format for reading registers:

address	function code	Date byte length	High distance value	Low distance value	CRC_L	CRC_H
01	03	02	xx	xx	xx	xx

3) Device response format of reading registers instruction error or device internal error:

address	function code	Date byte length	Error code high bit	Error code low bit	CRC_L	CRC_H
01	83	02	00	xx	xx	xx

4) The instruction format for writing the registers value is as follows:

address	function code	register address	high date bit	low date bit	CRC_L	CRC_H
01	06	xx	xx	xx	xx	xx

5) Write the correct response format to the device side for register operation:

The response packet is the same as the issued packet.

6) The response format for handling exceptions on the device side of writing register operations:

address	function code	Date byte length	Error code high bit	Error code low bit	CRC_L	CRC_H
01	86	02	00	xx	xx	xx

7) The instruction format for writing multiple register values is as follows (only teaching threshold registers are supported):

address	function code	Starting Addresses	Number of registers N	Number of bytes	Register Values	CRC_L	CRC_H		
01	10	00	4D	00	02	4	2x2	xx	xx

8) Write multiple registers to operate the correct response format for on-device processing:

Answered packets are the same as sending packets.

9) Write the response format of multiple register operators to handle exceptions on the device side:

address	function code	Date byte length	Error code high bit	Error code low bit	CRC_L	CRC_H
01	10	02	00	xx	xx	xx

Field Description:

1) Address: Device address, default to 0x01

2) Function code:

03- -Read Register; 06- -Write Register;

83- -Register read exception response; 86- -Register write exception response;

10--Write multiple registers; 90- -Write multiple register exception answers;

3) Register address:

All registers are 16 bit registers, and after modifying all registers, a "save configuration" instruction must be sent and the device must be powered on again to take effect. The description of the register is shown in the table on the right.

Register descriptions

Register address	Defines	Description	Permission	Value range
0x00 00	The distance value is 16 bits lower.	The output result of the sensor, which is the distance value for this sensor, Unit: resolution	Read only	Signed int data [-The largest number of journeys, + the largest number of journeys]
0x00 01	The distance value is 16 bits higher.			
0x00 02	Resolution	Sensor resolution	Read only	0-1mm; 1-0.1mm; 2-0.01mm; 3-0.001mm; 4-0.0001mm
0x00 03	Switch volume CH1 output state		Read only	0- Disconnect 1-on
0x00 04	Switch volume CH2 output state		Read only	0- Disconnect 1-on
0x00 06	MCU version number	The format is V1.01.1. The main version 1. Functional version 01. Revised version 0	Read only	0x1000~0x9999
0x00 07	Show the module version number		Read and write	0x1000~0x9999
0x00 17	Zero-point mode SHFT		Read and write	1- Zero after setting the teaching point 2- OFF
0x00 18	Near and far-end mode		Read and write	1- Near-end mode 2- Remote mode
0x00 19	Laser status		Read and write	0-incompetence 1-Enable
0x00 1A	Response speed		Read and write	1-1.5 2-3 3-10 4-25 5-50
0x00 1B	CH1 automatic tracking		Read and write	1- Open 2- Close 3- High-speed tracking
0x00 1C	CH1 teaching point		Read and write	
0x00 1D	CH1 teaching window		Read and write	0- Automatic Other - window size
0x00 1E	CH1 output delay		Read and write	0- Close 1- Open 2- Single pulse 3- Counte

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。

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(仅只支持教导阈值寄存器):

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 4D	00 02	4	2x2	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

06—写寄存器

83—读寄存器异常应答

86—写寄存器异常应答

10—写多个寄存器

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。寄存器说明见右表。

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]
0x00 01	距离值高 16 位			
0x00 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;
0x00 03	开关量 CH1 输出状态		只读	0- 断开 1- 导通
0x00 04	开关量 CH2 输出状态		只读	0- 断开 1- 导通
0x00 06	MCU 版本号	格式为 V1.01.1	只读	0x1000~0x9999
0x00 07	显示模块版本号	主版本1,功能版本01,修订版本1	读写	0x1000~0x9999
0x00 17	零点模式 SHFT		读写	1- 设置教导点后归零 2- OFF
0x00 18	远近端模式		读写	1- 近端模式 2- 远端模式
0x00 19	激光状态		读写	0-失能 1-使能
0x00 1A	响应速度		读写	1-1.5 2-3 3-10 4-25 5-50
0x00 1B	CH1 自动追踪		读写	1-关闭 2-开启 3-高速追踪
0x00 1C	CH1 教导点		读写	
0x00 1D	CH1 教导窗口		读写	0- 自动 其他-窗口大小
0x00 1E	CH1 输出延时		读写	1- 关闭 2- 开启 3- 单脉冲 4- 计数器

Register address	Defines	Description	Permission	Value range
0x00 1F	CH1 teaching modelower.	teaching modelower	Read and write	1-2 point teaching mode 2- Dynamic teaching 3- Prospect suppression 4- Background suppression 5- Dual mode
0x00 20	CH2 automatic tracking		Read and write	1- Close 2- On 3- High-speed tracking
0x00 21	CH2 teaching points		Read and write	
0x00 22	CH2 teaching window output state		Read and write	0- Automatic Other - window size
0x00 23	CH2 output delay number		Read and write	0- Close 1- Turn on 2- Single pulse 3- Counters
0x00 24	CH2 teaching mode	teaching mode	Read and write	1- 2 point teaching mode 2- Dynamic teaching 3- Prospect suppression 4- Background suppression 5- Dual mode
0x00 26	Switching CH1 output mode	Bright/dark communication state	Read and write	1- Bright Pass 2- Dark Pass
0x00 27	Switching CH2 output mode	Bright/dark communication state	Read and write	1- Brighten 2- Darkness 3- Complementary with CH1 4- Frequency modulation 5- Remote teaching 6- Pull-down laser 7- Pull up the laser 8- Host mode 9- slave mode
0x00 28	Switching amount CH1 output type		Read and write	1- NPN 2- PNP 3- push-pull
0x00 29	Switching amount CH2 output type		Read and write	1- NPN 2- PNP 3- push-pull
0x00 2A	Output rebound		Read and write	Unit and unit of measurement value

Register address	Defines	Description	Permission	Value range
0x00 2B	Display mode		Read and write	1- Normal mode 2- Inverted 3- ECO mode 4- ECO inversion
0x00 2C	ECO mode		Read and write	0-disabled 1-Empower
0x00 2D	Number of counters	When the count reaches this value in counter mode, it outputs a single pulse.	Read and write	-1 Default value
0x00 2E	Output ON delay	Determine the choice of output ON delay time	Read and write	-0, no delay, default value
0x00 2F	Output OFF delay	Determine the choice of output OFF delay time	Read and write	-0, no delay, default value
0x00 30	Single pulse width		Read and write	-10ms default value
0x00 31	Set the zero bias to 16 bits lower		Read and write	-275 to 275 for 300/310 mm Models
0x00 32	Set the zero bias to 16 bits higher			
0x00 4D	CH1 teaches the threshold	Teach the thresholds	Read and write	Less than the teaching threshold
0x00 4E	CH1 teaches the upper threshold	Teaching threshold	Read and write	Greater than the threshold of teaching
0x00 4F	CH1 teaching correction		Read only	
0x00 50	Anti-light interference switch		Read and write	1-Open Other-off
0x00 51	Shutter duty cycle		Read and write	0- Automatic 1- Follow the teaching point 3~75 duty cycle
0x00 80	Save the configuration		Write only	0
0x00 84	Porter Rate High		Read and write	0x00 or 0x01
0x00 83	Baud rate Low	Configure the baud rate. After sending the save configuration instruction, the restart takes effect. Only 2400, 4800, 9600, 19200, 38400, 115200 are supported for the time being.		0x0960、 0x12C0、 0x2580、 0x4800、 0x9600、 0xC200
0x00 85	Device ID	Configure the device address, default 0x01, restart valid after saving	Read and write	1~247
0x00 86	Parity check	Check bit setting	Read and write	0- No check;1- Strange check 2- Even check
0x00 87	Working mode	The working mode of configuring the equipment	Read and write	1- For continuous sending mode 2- For query mode (default)
0x00 89	Factory Resets		Write only	1-NO 2-YES

寄存器地址	定义	说明	权限	取值范围
0x00 1F	CH1 教导模式	教导模式	读写	1- 2点教导模式 2- 动态教导 3- 前景抑制 4- 背景抑制 5- 双模式
0x00 20	CH2 自动追踪		读写	1- 关闭 2- 开启 3- 高速追踪
0x00 21	CH2 教导点		读写	
0x00 22	CH2 教导窗口		读写	0- 自动 其他-窗口大小
0x00 23	CH2 输出延时		读写	1- 关闭 2- 开启 3- 单脉冲 4- 计数器
0x00 24	CH2 教导模式	教导模式	读写	1- 2点教导模式 2- 动态教导 3- 前景抑制 4- 背景抑制 5- 双模式
0x00 26	开关量 CH1 输出模式	亮/暗通状态	读写	1- 亮通 2- 暗通
0x00 27	开关量 CH2 输出模式	亮/暗通状态	读写	1- 亮通 2- 暗通 3- 与CH1互补 4- 频率调制 5- 远程教导 6- 拉高关激光 7- 拉高开激光 8- 主机模式 9- 从机模式
0x00 28	开关量 CH1 输出类型		读写	1- NPN 2- PNP 3- 推挽
0x00 29	开关量 CH2 输出类型		读写	1- NPN 2- PNP 3- 推挽
0x00 2A	输出回差		读写	单位同测量值单位

寄存器地址	定义	说明	权限	取值范围
0x 00 2B	显示模式		读写	1-正常模式 2-倒置 3-ECO模式 4-ECO倒置
0x 00 2C	ECO模式		读写	0-失能 1-使能
0x 00 2D	计数器个数	计数器模式时计数达到此值输出单脉冲	读写	-1 默认值
0x 00 2E	输出ON延时	判断输出ON延时时间选择	读写	-0, 不延时, 默认值 最大60000 单位ms
0x 00 2F	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 最大60000 单位ms
0x 00 30	单脉冲宽度		读写	-10ms 默认值 最大60000单位ms
0x 00 31	调零偏置低16位		读写	-275 to 275 for 300/310 mm models
0x 00 32	调零偏置高16位		读写	
0x 00 4D	CH1教导下阈值	教导下阈值	读写	小于教导上阈值
0x 00 4E	CH1教导上阈值	教导上阈值	读写	大于教导下阈值
0x 00 4F	CH1教导回差		只读	
0x 00 50	抗光干扰开关		读写	1-开 其他-关
0x 00 51	快门占空比		读写	0-自动 1-跟随教导点 3~75 占空比
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	0x00或0x01
0x 00 83	波特率 Low			0x0960、0x12C0、0x2580、0x4B00、0x9600、0xC200
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	检验校验设置	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	1-为连续发送模式 2-为查询模式（默认）
0x 00 89	恢复出厂设置		只写	1-NO 2-YSE

- 4) Register count:
The number of registers pre-read from a register instruction. Values range from 1 to 8.
- 5) Data byte length:
Read register instruction reply, the number of bytes in the reply data segment.
- 6) Error code:
When reading and writing registers, issuing instruction format is wrong, or the data segment in the device response package is error code. The meaning of the error code is shown in Table 2 below

Table 2 error code description

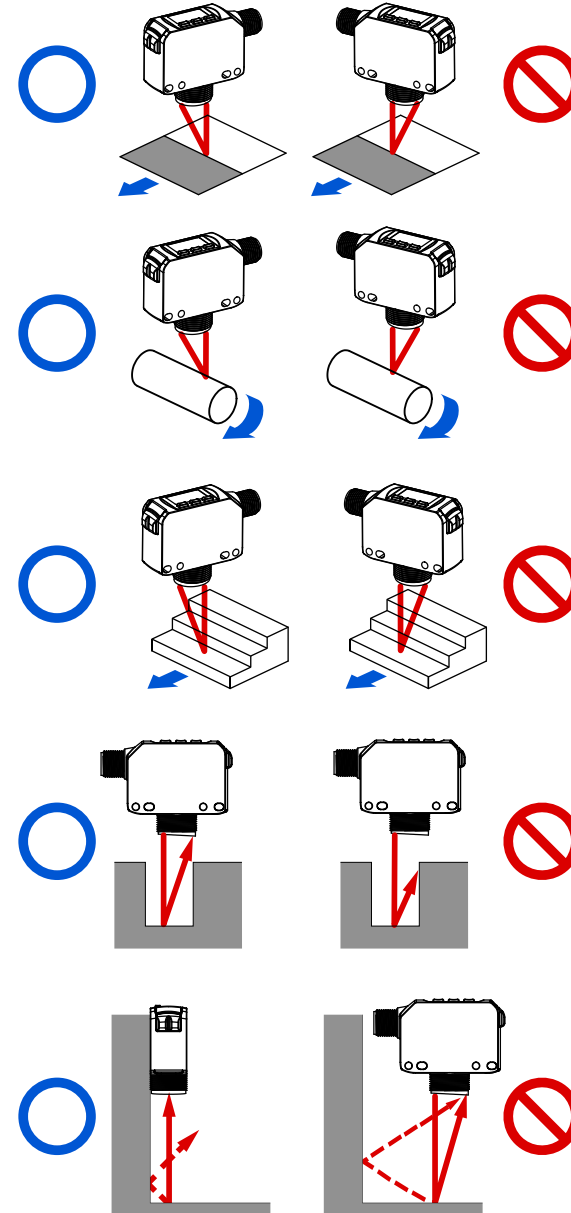
Error code	Description
0x0001	Register address error
0x0002	Register write error

- 7) CRC Check:
In the protocol, a message carries a two-byte CRC check code, which is CRC16 check, the penultimate second byte of the message is the low byte of the check code, and the penultimate first byte of the message is the high byte of the check code.
Parametric model: $X16 + X15 + x2 + 1$;
Polynomial: $0x8005$;
Initial value: $0xFFFF$

3 - An example of interactive information

Function	Instructions	Successful return value	Description
Gets the distance value	01 03 00 00 00 01 84 0A	01 03 02 DH DL CL CH	DH and DL are the high 8 bit and low 8 bit of the measured values, while CH and CL are the low 8 bit and high 8 bit of CRC, respectively
Gets the 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 minor version numbers of the version
Set the 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, BL2 are the highest, the second highest, the second lowest, and the lowest bits of baud rate, respectively. For example, the modified baud rate is 9600, BH1=00 BH2=00 CL=78 CH=22, BL1=25 BL2=80 CL=D2 CH=D3
Modify the device ID	01 06 00 85 IH IL CL CH	01 06 00 85 IH IL CL CH	IH, I L for ID high and low bytes, 1-247,0x00 for broadcast address. Modify ID to 2, IH = 00 IL = 02 cl = 19 ch = E2
Change the parity bit	01 06 00 86 00 01 CL CH	01 06 00 86 00 01 CL CH	Set to odd check
Modify the device mode	01 06 00 87 00 M CL CH	01 06 00 87 00 M CL CH	M is device mode instruction byte M = 00 is continuous send mode M = 01 is query mode (default)
Save the configuration	01 06 00 80 00 00 88 22	01 06 00 80 00 00 88 22	Reboot takes effect after saving
Restore factory settings	01 06 00 89 00 00 58 20	01 06 00 89 00 00 58 20	After saving, the restart takes effect, and the ID address and baud rate of the device are reset to Ex-factory status

Installaton diagram



1. In the case of color or material difference
When the material or color of moving object is extremely different, install it in the direction shown on the left to keep the measurement error to a minimum.
2. Detect rotating objects
When detecting a rotating object, install it in the direction shown on the left, which can suppress the influence of the object's vertical vibration and position shift.
3. When there is a step
If there is a step in the moving detection object, install it according to the method shown on the left, so as to suppress the influence of the step edge during measurement.
4. Measure in narrow places and recessed parts
In the case of measuring in a narrow place or hole, please be careful not to block the light path from the light emitting part to the light receiving part when installing.
5. When installed on the wall
Please install according to the method shown on the left to avoid the multiple reflected light from the wall entering the light receiving part.

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。错误码含义如下表。

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: $x^{16} + x^{15} + x^2 + 1$

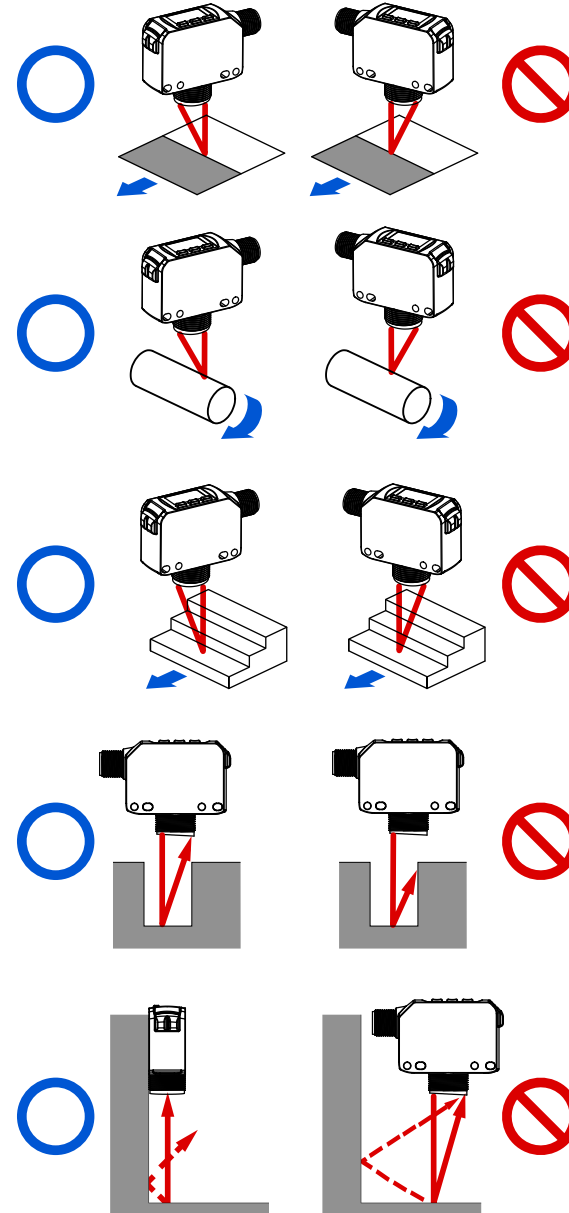
多项式:0x8005

初始值:0xFFFF

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 0300 00 00 02 C4 0B	01 03 04 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 0400 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 C CH	01 06 00 83 BH1 BH2 C 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=CH=D3
	01 06 00 84 BL1 BL2 CL CH	01 06 00 84 BL1 BL2 CL CH	
修改设备ID	01 06 00 85 IH IL CL CH	01 06 00 85 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 86 00 01 CL CH	01 06 00 86 00 01 CL CH	设置成奇校验
修改设备模式	01 06 00 87 00 M CL CH	01 06 00 87 00 M CL CH	M为设备模式的指令字节 M=01为连续发送模式 M=02为查询模式(默认)
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

安装示意图



1. 材质、有色差的情况下测量时,移动的测量对象物的材质、颜色极端不同的情况下,按照左图所示方向进行安装,从而可将测量误差控制在最小限度。

2. 对旋转的对象物进行检测
对旋转的对象物进行检测时,按照左图所示方向进行安装,从而可抑制对象物的上下振动和位置偏移等的影响。

3. 存在段差的情况下
移动的检测对象物存在段差的情况下,请按照左图所示方法进行安装,从而可在测量时抑制段差边缘所产生的影响。

4. 在狭窄场所和凹陷部分进行测量
在狭窄场所和孔中进行测量的情况下,安装时,请注意避免遮挡投光部至受光部的光路。

5. 安装在墙上时
请按照左图所示方法进行安装,以免墙面产生的多重反射光入光到受光部分。另外墙面反射率较高的情况下,如改成无光泽的黑色,则效果更好。