

Product Description:

Long-range laser distance measurement product with a measurement range of up to 100 meters, compact size, and a robust metal housing. It offers excellent resolution, accuracy, repeatability, and detection frequency across the full range of key parameters. Suitable for shelf operation machines, automatic parking systems, and lifting equipment.



Product features:

- Features a clear OLED display and adjustment buttons.
- Small and sturdy metal casing
- Rich in fieldbus interfaces

Product Models:

Type	Detection	Distance	Beam	Interface	Connection
OSM300-RPL100EIPSIQ12	Reflective	0.15...100m	Red laser	Ethernet/IP+SSI	M12 connectors
OSM300-RPL100PNSIQ12	Reflective	0.15...100m	Red laser	Profinet+SSI	M12 connectors
OSM300-RPL30EIPSIQ12	Reflective	0.15...30m	Red laser	Ethernet/IP+SSI	M12 connectors
OSM300-RPL30PNSIQ12	Reflective	0.15...30m	Red laser	Profinet+SSI	M12 connectors

Note: L100 and L30 in the model numbers refer to the maximum test distance of the product

Technical Specification

Power supply	DC 18 ... 30 V; (current < 250mA@DC24V)	Spot Size	5mm+ (2 mm × distance, units: meters)
Measuring range	0.15mm...100m, On the reflective sheeting "Diamond Grade"	Transmission Protocol	Ethernet/IP、Profinet+、SSI(unidirectional output)
Light source	Red laser, class2	Resolution	0.1mm, 0.125mm, 1mm, 10mm, 100mm
Connection Type	M12 connectors	Accuracy	±2mm
Repeatability	2mm	Display type	OLED display screen
Response Time	2ms	Modulation frequency	Fixed
Measurement period	1ms	Output time	1ms

Ambient light resistance 100,000lx

Put Opera Aluminum alloy housing;

Storage temperature -40°C...+75°C

Operating temperature -20°C...+55°C

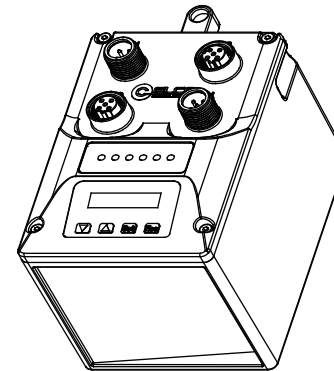
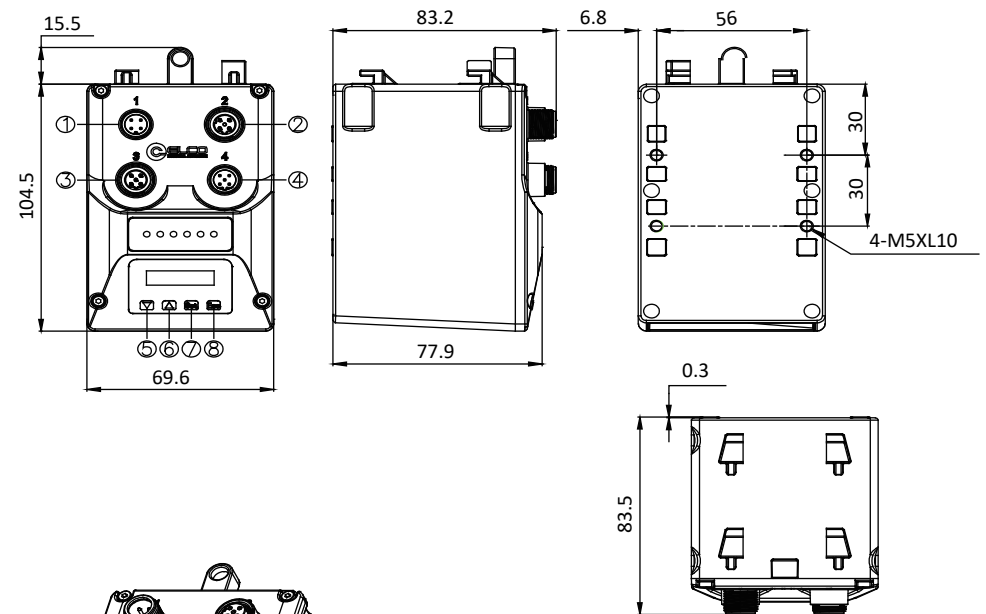
Maximum movement speed

maximum movement speed ≤15m/s²

Protection rating IP67

Dimensions 104.5*69.6*77.9mm

Dimensions



Interface Definition:

- | | |
|-----------------------|-----------------------|
| ①--Power | ②--100M Ethernet port |
| ③--100M Ethernet port | ④--SSI port |
| ⑤--Down | ⑥--Up |
| ⑦--Settings | ⑧--Exit |

产品说明:

长距离激光测距产品,测量距离可达百米,体积小,具备坚固的金属外壳,分辨力、准度、重复精度和探测频率,关键参数在全量程内表现优秀。适用于货架操作机、自动驻车系统、起重设备等。



产品特点:

- 具有清晰的OLED显示屏和调节按键
- 小型、坚固的金属外壳
- 具有丰富的现场总线接口



选型表:

型号	检测模式	检测范围	光源类型	接口	接线方式
OSM300-RPL100EIPSIQ12	镜反射型	0.15...100m	红色激光	Ethernet/IP+SSI	M12连接器
OSM300-RPL100PNSIQ12	镜反射型	0.15...100m	红色激光	Profinet+SSI	M12连接器
OSM300-RPL30EIPSIQ12	镜反射型	0.15...30m	红色激光	Ethernet/IP+SSI	M12连接器
OSM300-RPL30PNSIQ12	镜反射型	0.15...30m	红色激光	Profinet+SSI	M12连接器

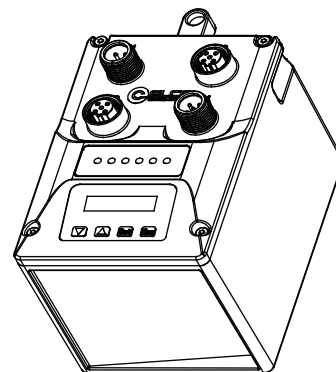
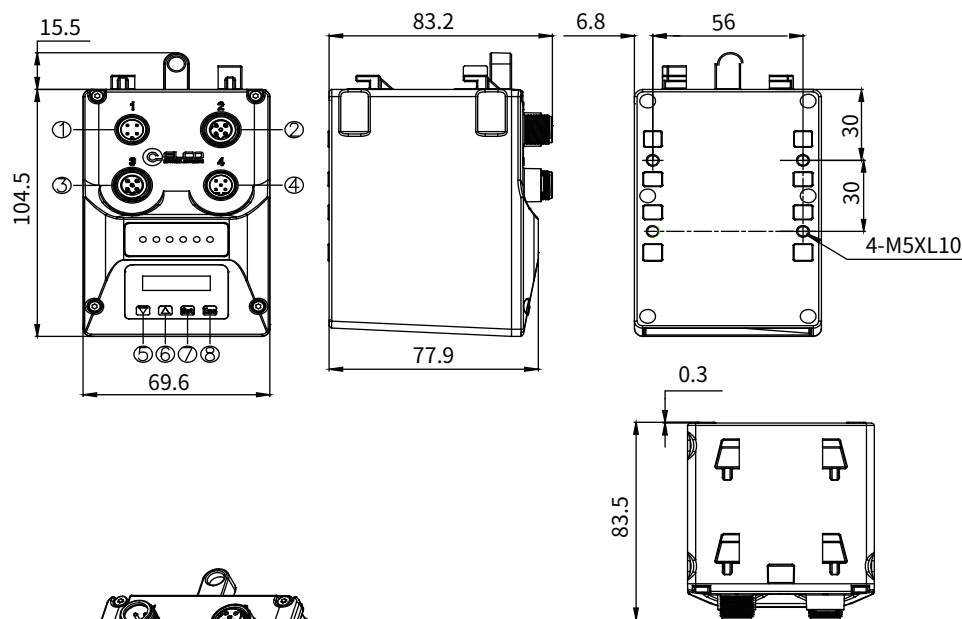
注:型号中的L100、L30指产品的最远测试距离

技术参数

供电电压	DC 18 ... 30 V; (电流<250mA@DC24V)	光斑尺寸	5mm+ (2mm×距离, 单位: 米)
测量范围	0.15mm...100m, 在反光膜“Diamond Grade”上	通讯	Ethernet/IP、Profinet+、SSI(单向输出)
光源类型	红色激光, class2	分辨率	0.1mm, 0.125mm, 1mm, 10mm, 100mm
连接类型	M12连接器	准确度	±2mm
重复精度	2mm	显示器	OLED显示屏
响应时间	2ms	调制频率	固定
测量周期	1ms	输出时间	1ms

抗环境光能力	100,000lx	最大移动速度	15m/s
材质	外壳: 压铸锌	最大加速度	≤15m/s ²
存储温度	-40°C...+75°C	防护等级	IP67
工作温度	-20°C...+55°C	外型尺寸	104.5*69.6*77.9mm

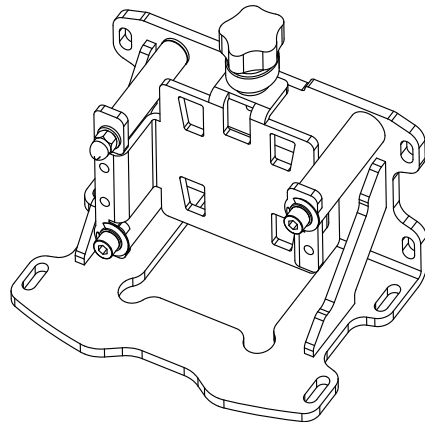
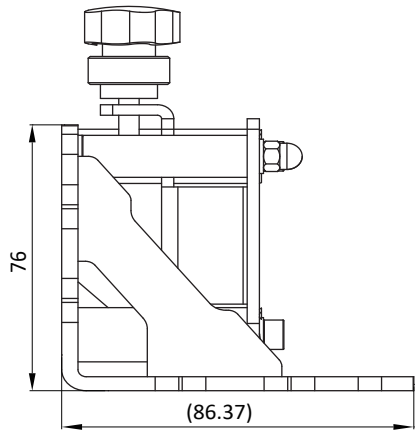
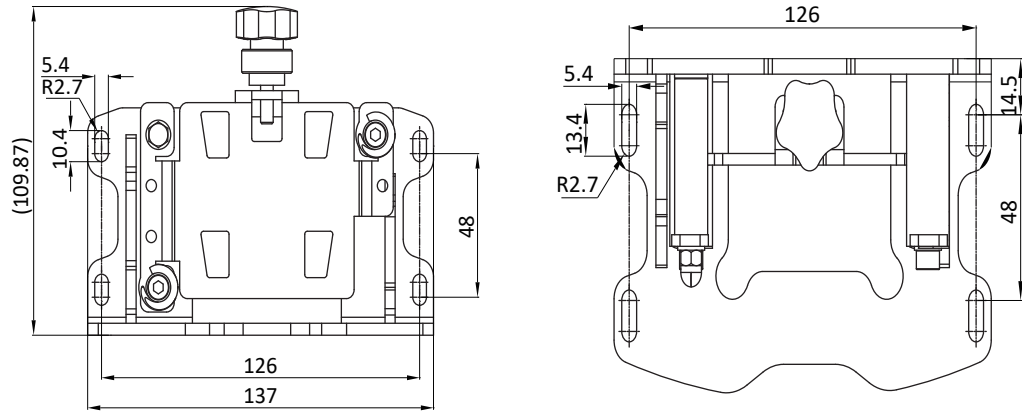
产品外形尺寸



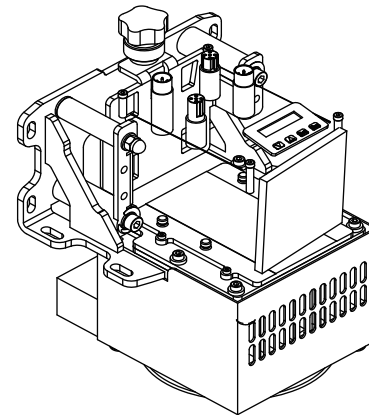
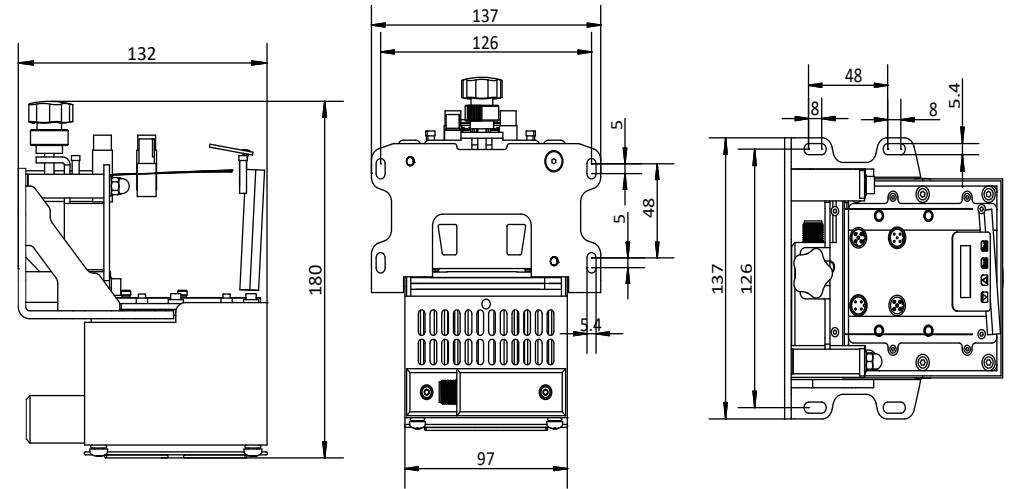
端口定义:

- | | |
|-----------|-----------|
| ①--电源 | ②--100M网口 |
| ③--100M网口 | ④--SSI口 |
| ⑤--向下 | ⑥--向上 |
| ⑦--设置 | ⑧--退出 |

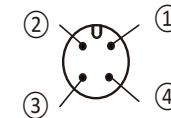
Bracket external dimensions



Refrigeration unit external dimensions and technical specifications

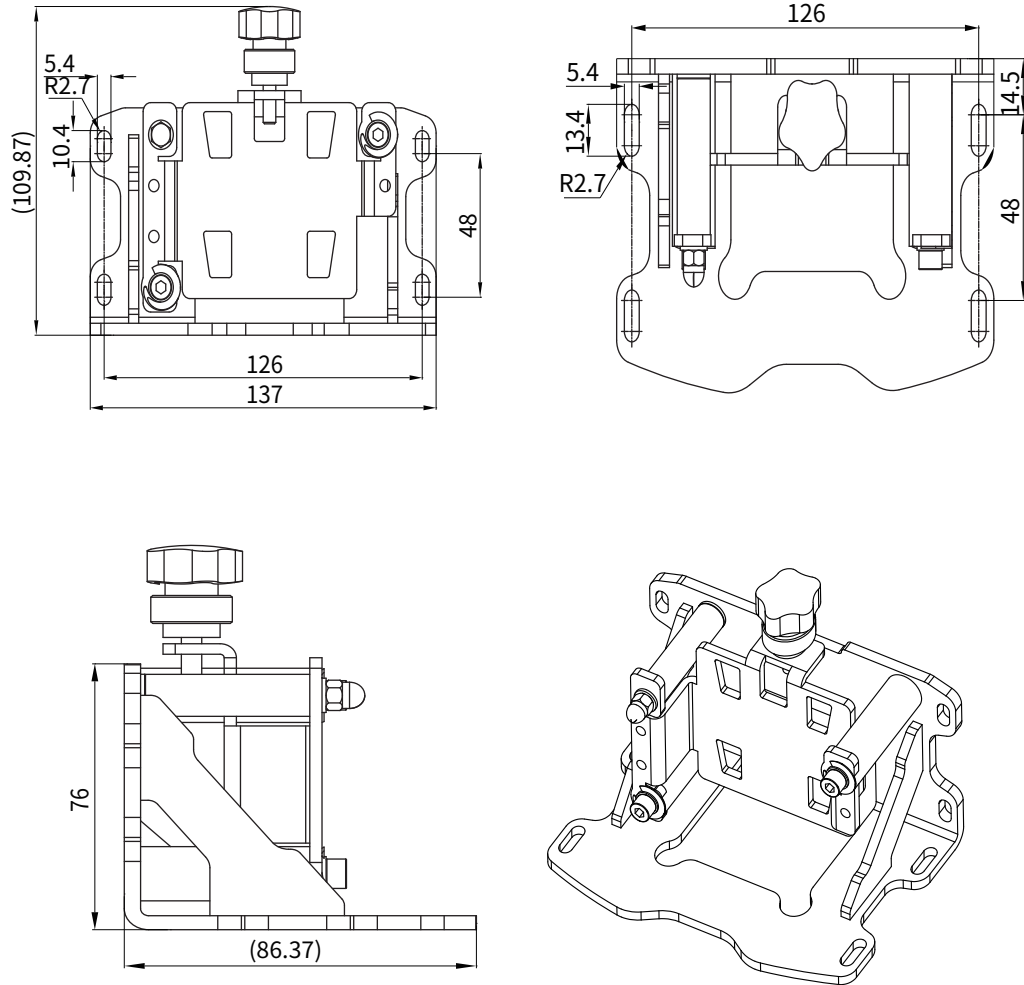


Interface Definition:

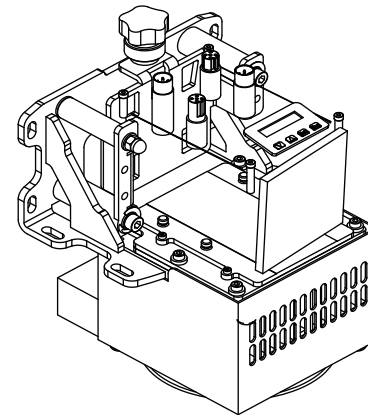
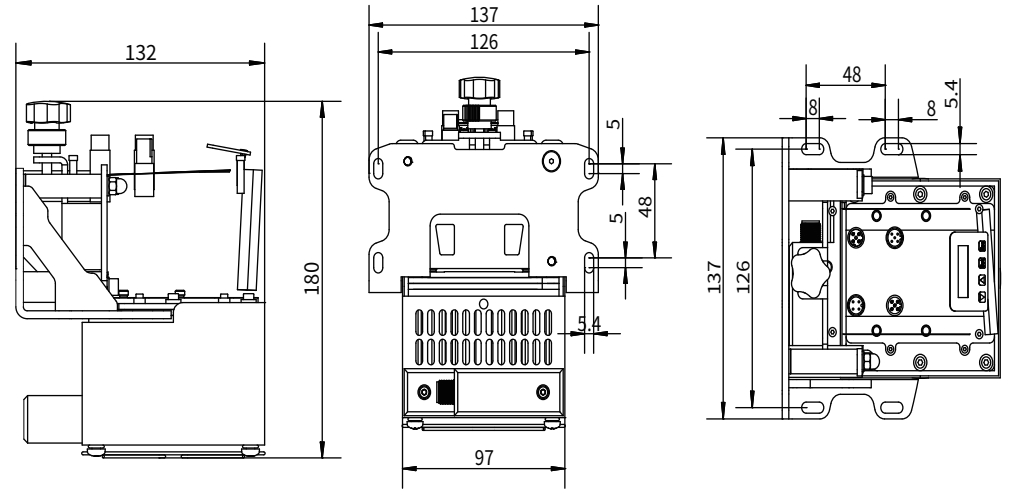


- ① --VCC Supply voltage: DC 24V
- ② --VCC Connection Type: M12 connectors
- ③ --GND
- ④ --GND

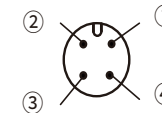
支架外形尺寸



制冷装置外形尺寸及技术参数



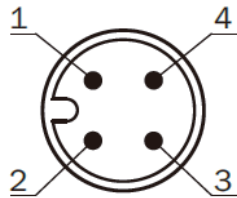
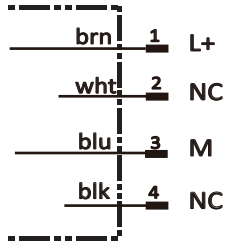
端口定义及参数:



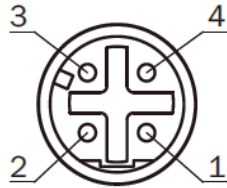
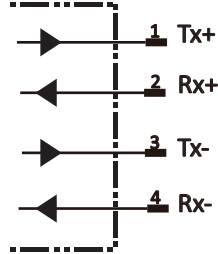
- ①--VCC
- ②--VCC
- ③--GND
- ④--GND

供电电压: DC 24V
连接类型: M12连接器

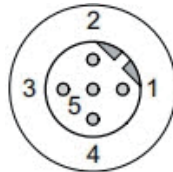
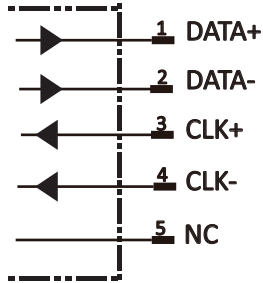
Interface definition and wiring diagram



Power connector type



Profinet connector type
Ethernet connection type
Port 0, Port 1

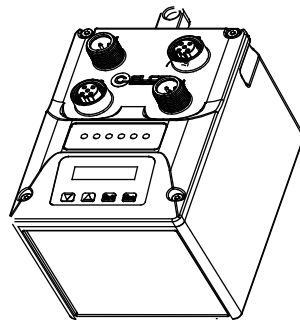


SSI connection type

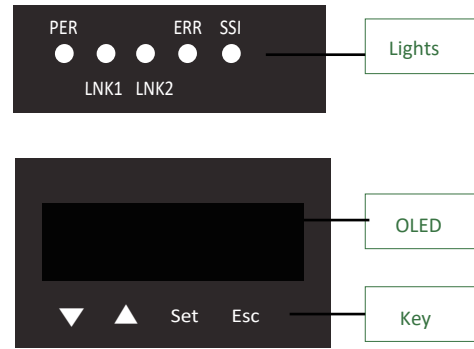
Instruction

1.Functional Description

The device consists of a laser, an optical receiving unit, and a built-in evaluation unit. The sensor emits a light beam that is reflected by a mirror into the optical receiving unit. The built-in evaluation unit determines the distance between the sensor and the mirror using the phase-correlation time-of-flight method. During measurement, either the mirror or the device can be linearly moved along the laser beam. The measured distance is transmitted via a data interface and can be used, for example, in control systems or position regulation circuits.



2.Indicator lights and key functions

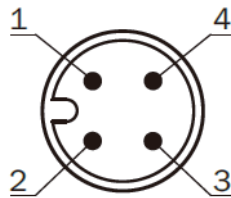
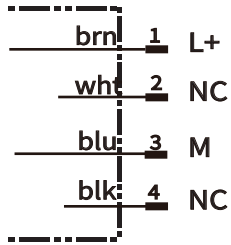


Display screen:Provides abundant information. Parameters can also be accessed and configured via the display.
Run mode display: The device has two run modes: measured value display and menu display. On the screen, the run mode is indicated by the RUN and MEN icons.
Note !!!
The distance value resolution on the display is always "mm", and the speed value resolution is always "mm/s".
Positive values are displayed without a sign, while negative values are displayed with a "-" sign. The display range for negative values is limited to 5 decimal places. Therefore, in the measured value display mode, values below -99,999 will have the sign and the highest decimal place replaced with an "!" symbol.

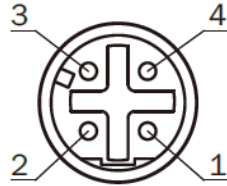
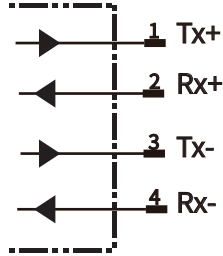
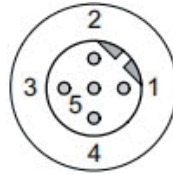
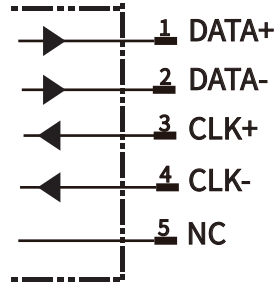
The status of the LED device and all interfaces is displayed via the LED lights as described in the table below.

LED	Description
PWR	Power on, green light stays on.
LNK1	Ethernet Port 1 Connection Status (LINK) : ① LED Orange/Green Blinking:Data transmission active ② LED Green:Connected to next device (LINK) ③ LED Off:No connection
LNK2	Ethernet Port 2 Connection Status (LINK): ① LED Orange/Green Blinking:Data exchange active ② LED Green:Connected to next device (LINK) ③ LED Off:No connection
ERR	Normal state:Green light is on. Error state:Red light is on, including the following error conditions: ① Abnormal measurement (spot not on the reflector; optical interference); ② Insufficient signal strength (out of specified range; dirty lens/reflector); ③ Exceeded laser diode lifespan; ④ Out of specified temperature limits.Connection (LINK): ⑤ LED off: No connection
SSI	SSI Communication Indicator ① Normal communication: Green light (steady on) ② No connection or no communication: Orange light (steady on)

接口定义和接线图



电源连接类型

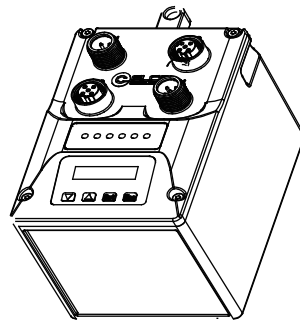
Profinet连接类型
以太网连接类型
端口port0、port1

SSI连接类型

使用说明

1. 功能说明

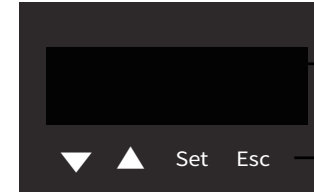
设备由一个激光器、一个光学接收装置以及一个内置的评价单元构成。传感器发出光束，由反射镜反射到光学接收装置中。内置的评价单元用相位相关式飞行时间测量法确定传感器与反射镜之间的距离。测量时，反射镜或者设备都可以沿着激光光束线性移动。测得的距离通过数据接口传输，例如可以在控制系统或者位置调节回路中使用。



2. 指示灯及按键说明



指示灯



显示屏

按键

显示屏，可提供大量信息。此外，还可通过显示屏调取和设置参数。

运行模式显示：设备的运行模式有测量值显示和菜单显示之分，在显示屏中，运行模式通过 RUN 和 MEN 图标显示。

注意!!!

显示屏中的距离值分辨率始终为“mm”，速度值分辨率始终为“mm/s”。正的数值不带符号，负的数值带有“-”号。负数值的示值范围被限制为5个小数位。因此，在测量值显示运行模式中，低于-99,999值时，符号和最高小数位将被替换成“!”号

LED 设备状态和所有接口的状态都通过LED灯按下表所述的方式显示

LED	说明
PWR	上电后绿色常亮
LNK1	以太网口Port1连接状态 (LINK) : ① LED橙绿闪烁: 数据交换激活 ② LED绿色: 与下一个设备存在连接 (LINK) ③ LED熄灭: 没有连接
LNK2	以太网口Port2连接状态 (LINK) : ① LED橙绿闪烁: 数据交换激活 ② LED绿色: 与下一个设备存在连接 (LINK) ③ LED熄灭: 没有连接。
ERR	传感器处于正常状态时，绿色常亮。 传感器处于报错状态时，红色常亮，包括的报错情况有： ① 异常测量（光斑没有落到反射板；传感器受到光学串扰）； ② 信号强度不足（使用距离超出规定的范围；镜头或反射板脏污）； ③ 超出激光发射管使用寿命； ④ 超出产品规定温度允许上下限。连接 (LINK) ⑤ LED熄灭: 没有连接。
SSI	SSI通讯指示灯 ① 正常通讯时，绿色常亮 ② 未连接或者未通讯时，橙色常亮

Buttons

buttons	Description
▼	<ul style="list-style-type: none"> • Paging through process values or (main) menus • Decreasing values
▲	<ul style="list-style-type: none"> • Paging through process values or (main) menu • Increase value
Set	<ul style="list-style-type: none"> • Enter menu mode • Switch to the next menu level • Confirm selection
Esc	<ul style="list-style-type: none"> • Do not save parameter values/inputs, exit directly • Return to the previous menu level or enter measured value display mode

3. Installation

3.1 Installation process

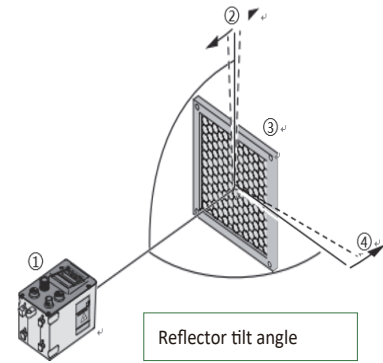
- Follow the installation guidelines provided in "Installation Guidelines" to ensure proper placement.
- Refer to "Selecting and Installing the Reflector" for guidance on reflector selection and mounting.
- Follow the steps in "Installing the Calibration Bracket and Distance Sensor" to secure the sensor and bracket.
- Complete the wiring as described in "Electrical Installation" to power and connect the sensor.
- Ensure precise alignment between the sensor and reflector by following the instructions in "Aligning the Distance Sensor and Reflector."

3.2 Installation Instructions

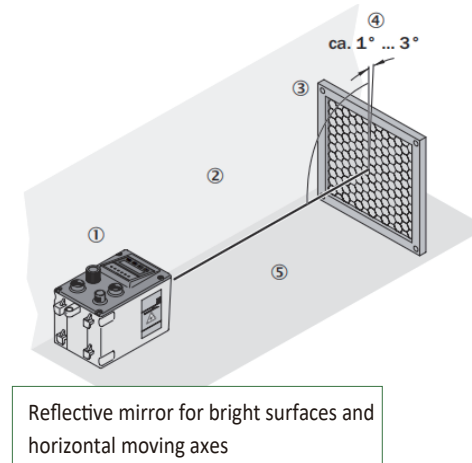
- Includes technical specifications.
- Prevent direct sunlight exposure to the sensor.
- Avoid rapid temperature changes to prevent condensation.
- The installation location must be able to support the device's weight.
- In low-temperature environments (e.g., cold storage), use a sensor with an optional heating device.
- In high-temperature environments, use a sensor with an optional cooling housing.
- Maintain sufficient distance from other distance sensors; refer to the "Mounting Multiple Distance Sensors" instructions.
- Maintain sufficient distance from data transmission photoelectric sensors.

3.3 Selection and Installation of Reflectors

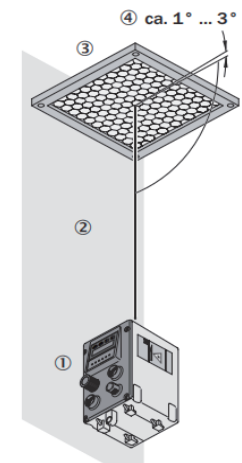
- Selecting Reflector Size: Ensure the laser spot fully hits the reflector.
- If the reflector is installed on the vehicle and the distance sensor is fixed in position, the minimum size of the reflector can be calculated based on the spot size related to the distance.
- If a distance sensor is installed on a vehicle, a larger reflector is typically required to account for the swinging factors of the vehicle and the laser.
- Note: Even if the measurement distance is short and the spot size is small, the reflector's dimensions must still be at least 100 mm × 100 mm.



- Bright surfaces parallel to the laser beam axis may cause beam deflection or scattered light, leading to measurement errors. Therefore, the reflector should be tilted at an angle of 1°...3° away from the bright surface and aligned toward an unobstructed space. Bright surfaces could include rack profiles, pallets with stretch film, door frames, or runways.
- If the sensor is installed in the moving axis of a storage and retrieval system, tilt the reflector away from the runway toward the cover direction.
- If the sensor is installed in the lifting axis of a storage and retrieval system, tilt the reflector away from the door frame.



- ① Distance sensor
- ② Bright surfaces, such as shelf profiles, stretch film
- ③ Retroreflector
- ④ Inclination angle of approximately 1°...3°
- ⑤ Bright surfaces, such as running tracks



- ① Distance sensor
- ② Bright surfaces, such as the racks of storage and retrieval systems
- ③ Retroreflector
- ④ Inclination angle of approximately 1°... 3°

按键

按键	说明
▼	<ul style="list-style-type: none"> 在流程值或（主）菜单中翻页 减小数值
▲	<ul style="list-style-type: none"> 在流程值或（主）菜单中翻页 提高数值
Set	<ul style="list-style-type: none"> 进入菜单模式 切换到下一级菜单层 确认选择
Esc	<ul style="list-style-type: none"> 不保存参数值/输入的选项，直接退出 返回上一级菜单层或进入测量值显示模式

3. 安装说明

3.1 安装流程

- 在遵守安装提示的情况下确定安装位置参见 "安装提示"。
- 选择与安装反射镜参见 "选择与安装反射镜"。
- 安装校准支架和距离传感器参见 "安装校准支架和距离传感器"。
- 进行电气连接参见 "电气安装"。
- 相互对准距离传感器和反射镜参见 "相互对准距离传感器和反射镜"

3.2 安装提示

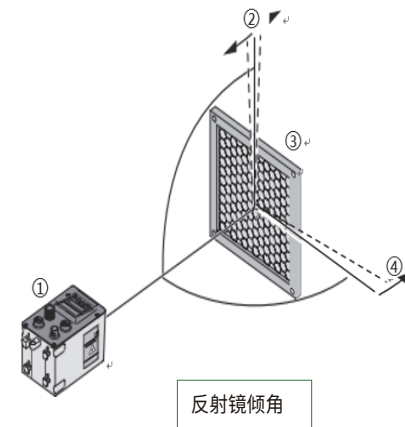
- 包含技术参数。
- 防止传感器受到阳光直射。
- 为避免冷凝水，请勿使设备承受急剧温度变化。
- 安装位置必须足以承受设备重量。
- 环境温度较低时（例如冷冻储存中），使用选配加热装置的传感器。
- 温度较高时，使用选配冷却外壳的传感器。
- 与其他距离传感器保持足够的距离，参见 "布置多个距离传感器"说明。
- 与数据传输光电传感器保持足够的距离。

3.3 选择与安装反射镜

- 反射镜尺寸
 - 选择反射镜尺寸，确保光点完全射中反射镜。
 - 如果反射镜安装在车辆上且距离传感器安装在固定的位置上，可以通过与距离相关的光点尺寸计算反射镜的最小尺寸。如果距离传感器安装在车辆上，通常需要更大的反射镜，才能顾及车辆和激光器的摆动因素。
- 提示：即使由于测量距离短，光点较小，反射镜的尺寸也必须至少达到 100 mm x100 mm

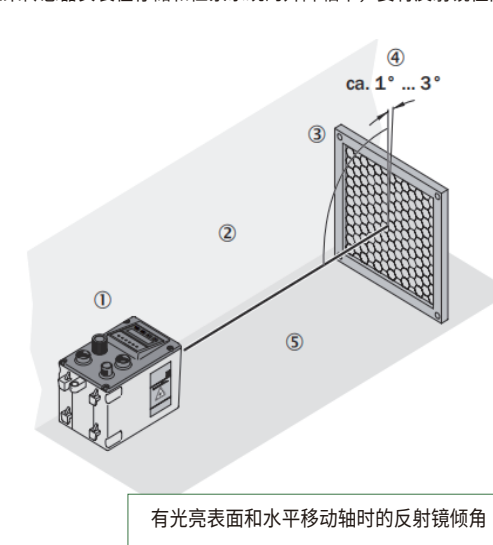
反射镜倾角

为了避免直接的表面反射：要以大约 +1°... +3°的倾角将反射镜安装在 2 个轴（水平或垂直）的其中之一上。



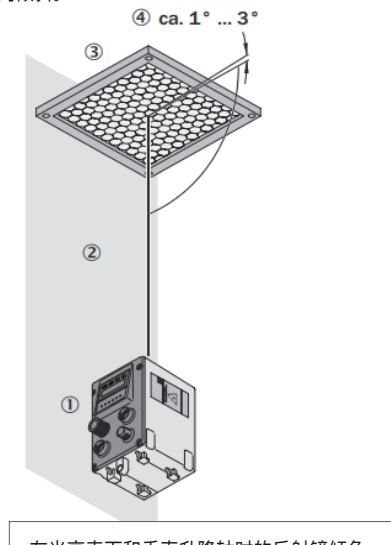
- ① 距离传感器
- ② 反射镜垂直轴的倾角大约 $\pm 1^\circ \dots +3^\circ$
- ③ 反射器
- ④ 反射镜水平轴的倾角大约 $+1^\circ \dots +3^\circ$

- 平行于激光光束轴的光亮表面可能引起射束转向或散射光，从而造成测量错误。因此，应将反射镜以 $1^\circ \dots 3^\circ$ 的倾角偏离光亮的表面，对准无遮挡的空间。光亮表面可能是架子型材、带拉伸膜的底板、门架或运行轨道等。
- 如果传感器安装在存储和检索系统的移动轴中，要往盖子方向将反射镜倾斜离开运行轨道。
- 如果传感器安装在存储和检索系统的升降轴中，要将反射镜往离开门架的方向倾斜。



有光亮表面和水平移动轴时的反射镜倾角

- ① 距离传感器
- ② 光亮的表面，例如架子型材、伸缩膜
- ③ 反射器
- ④ 倾角约 $1^\circ \dots 3^\circ$
- ⑤ 光亮的表面，例如运行轨道

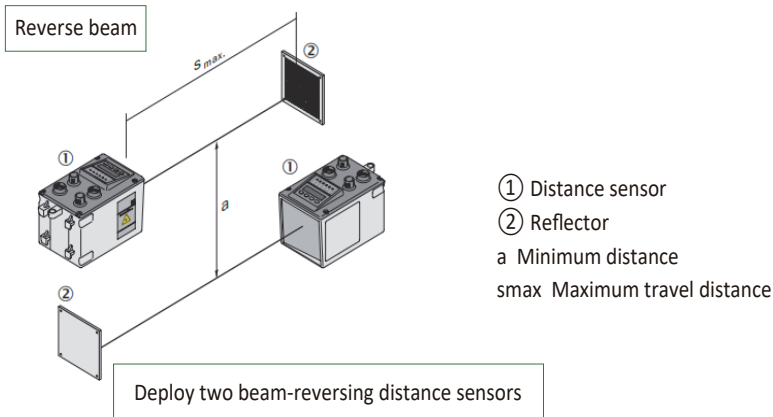
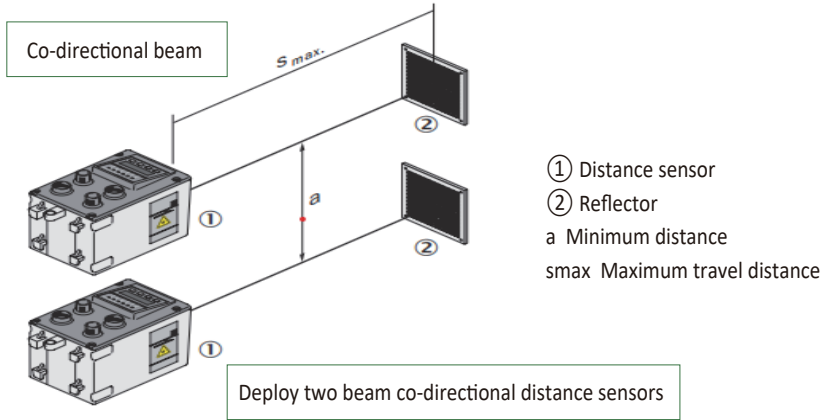


有光亮表面和垂直升降轴时的反射镜倾角

- ① 距离传感器
- ② 光亮的表面，例如存储和检索系统的门架
- ③ 反射器
- ④ 倾角约 $1^\circ \dots 3^\circ$

3.4 Install multiple distance sensors

When installing multiple distance sensors side by side, the minimum installation distance must be considered. The minimum distance a between optical axes depends on the maximum measuring range s_{max} . This distance applies to both co-directional and contra-directional beam installations.



Formula: Installation of calibration bracket and distance sensor
 $a \geq 0.1 \text{ m} + 0.01 \times s_{max} \text{ [m]}$

Example

Maximum travel distance (s_{max}): 60 m

Calculation of minimum distance:

$$a \geq 0.1 \text{ m} + 0.01 \times 60 \text{ m} = 0.1 \text{ m} + 0.6 \text{ m} = 0.7 \text{ m}$$

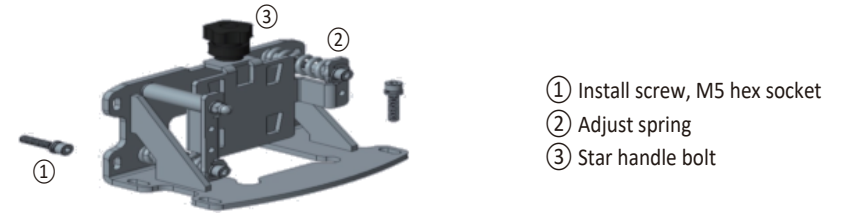
3.5 Installation of calibration bracket and distance sensor

The distance sensor is installed using an optional calibration bracket, which is suitable for mounting in both horizontal and vertical planes.

If the device is used for vertical measurements (e.g., in the lift axis of a storage and retrieval system), the calibration bracket can be mounted horizontally or an optional deflection mirror can be used.

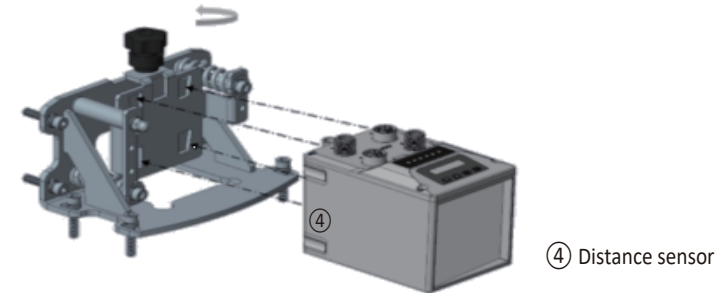
Note: The operating device must be accessible.

1. Use the included screws to install the calibration device through the four elongated holes.



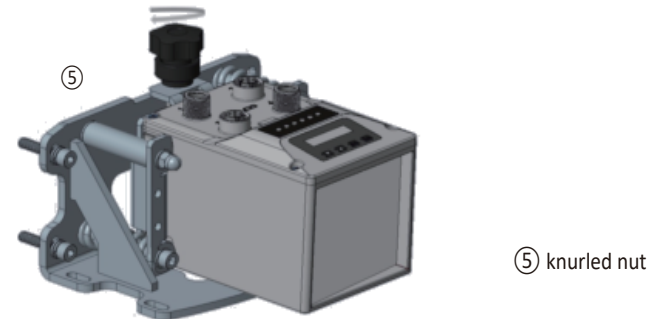
2. Loosen the star handle bolt.

3. Thread the distance sensor through the calibration bracket.



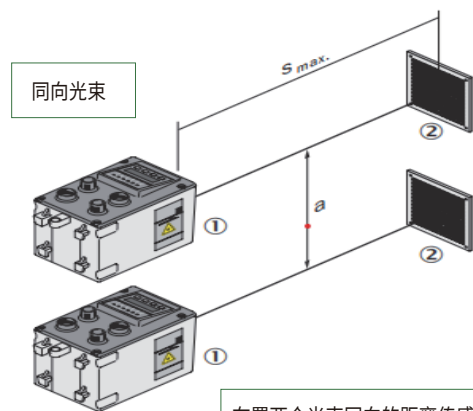
4. Secure the distance sensor with the star handle bolt.

5. Tighten the knurled nut against the star handle bolt.



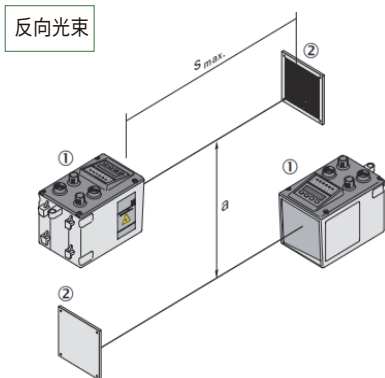
3.4 布置多个距离传感器

如果想并排安装多个距离传感器，必须考虑安装时的最小距离。光学轴的最小距离 a 取决于最大的行进距离 s_{max} 。该距离适用于光束同向和反向的安装情况。



布置两个光束同向的距离传感器

- ① 距离传感器
- ② 反射器
- a 最小距离
- s_{max} 最大行进距离



布置两个光束反向的距离传感器

- ① 距离传感器
- ② 反射器
- a 最小距离
- s_{max} 最大行进距离

公式：安装校准支架和距离传感器

$$a \geq 0.1 \text{ m} + 0.01 \times s_{max} \text{ [m]}$$

示例

最大行进距离 s_{max} : 60 m

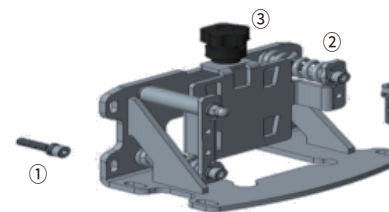
计算最小距离: $a \geq 0.1 \text{ m} + 0.01 \times 60 \text{ m} = 0.1 \text{ m} + 0.6 \text{ m} = 0.7 \text{ m}$

3.5 安装校准支架和距离传感器

距离传感器通过选配的校准支架安装，校准支架适合于水平和垂直平面上的安装。

如果将设备用于进行垂直方向测量（例如在存储和检索系统的升降轴中），可以将校准支架卧倒安装或者使用选配的偏转镜。
提示:必须可接触到操作装置。

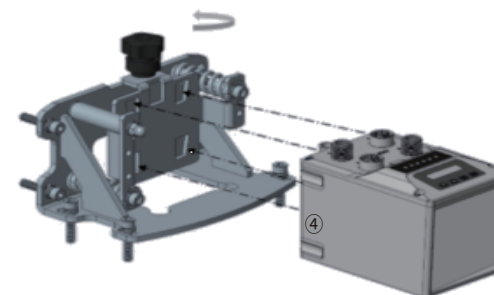
1. 用附带的螺钉通过四个长孔安装校准装置。



- ① 安装螺丝, M5 内六角
- ② 调节弹簧
- ③ 星形手柄螺栓

2. 松开星形手柄螺栓。

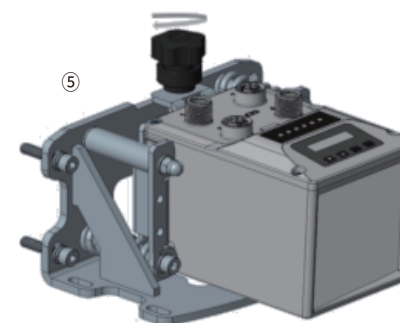
3. 将距离传感器穿入校准支架中。



- ④ 距离传感器

4. 用星形手柄螺栓固定距离传感器。

5. 用滚花螺母抵住星形手柄螺栓。

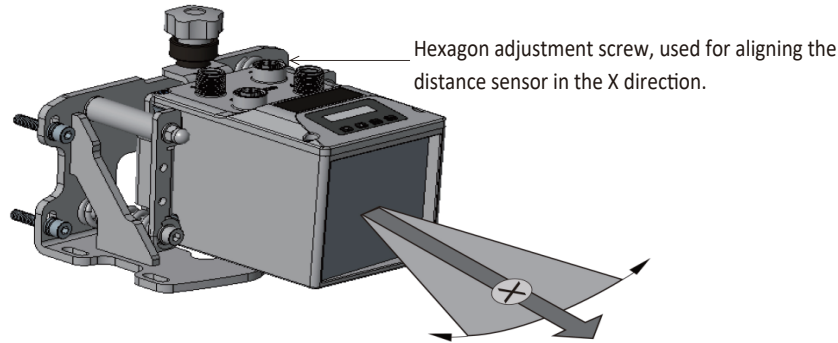


- ⑤ 滚花螺母

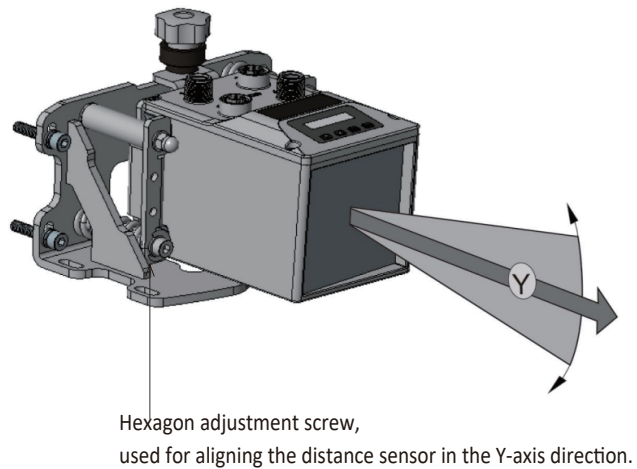
3.6 Mutual alignment of the distance sensor and the reflector

Align the distance sensor with the calibration bracket and perform the following steps:

- 1..Initial Setup: Position the distance sensor and reflector at a short distance.
- 2.Preliminary Alignment: Adjust the sensor to ensure the laser spot hits the center of the reflector.
- 3.Distance Verification: Gradually increase the distance between the sensor and reflector. The laser spot must remain centered on the reflector. If deviation occurs, use the adjustment screws on the calibration bracket to realign.



Align the distance sensor in the X direction.



Align the distance sensor in the Y direction.

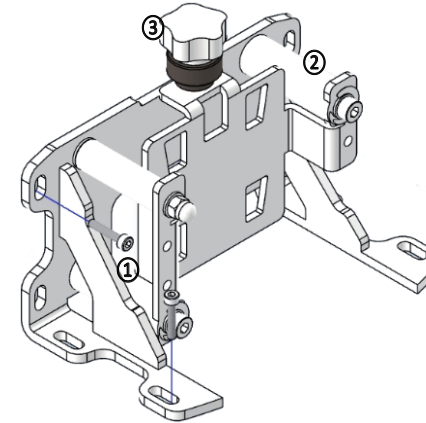
Note:

The adjustment screws at the factory are set to a maximum change of ± 3 mm. This results in a spring travel of 41.5 ± 3 mm, which corresponds to a maximum adjustment angle of $\pm 2^\circ$ in the X-direction and $\pm 3.5^\circ$ in the Y-direction.

3.7 Installation of cooling equipment and distance sensors

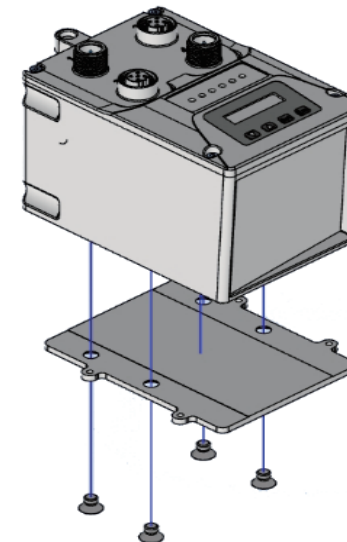
The distance sensor is installed using an optional calibration bracket and cooling device, with the calibration bracket suitable for installation on both horizontal and vertical planes.

- 1.Install the calibration device using the provided screws through the four elongated holes.



- ① Install screw, M5 hex socket
- ② Adjust spring
- ③ Star handle bolt

- 2.Assemble the sheet metal main unit mounting plate onto the distance sensor, paying attention to the assembly direction.

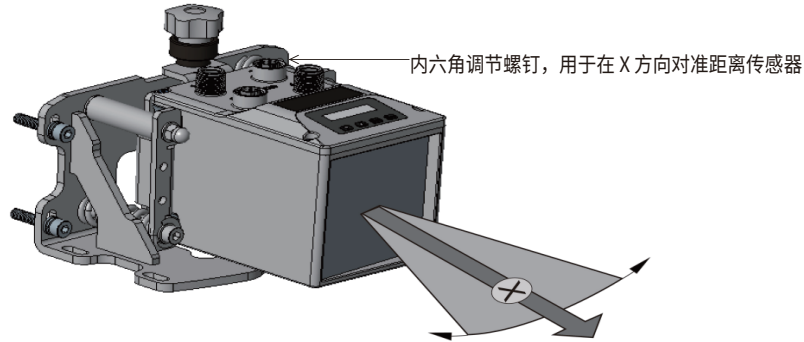


- ④ Distance sensor
- ⑤ Sheet Metal Chassis Mounting Plate

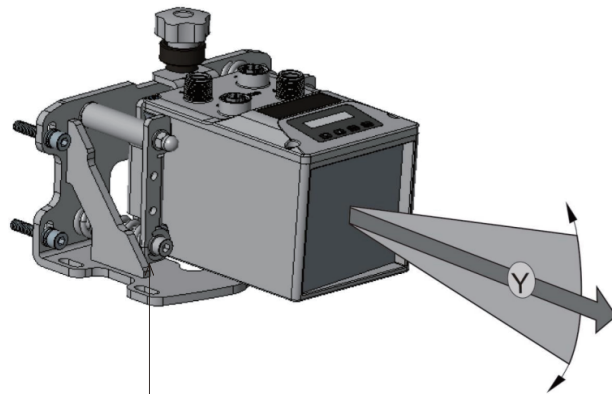
3.6 相互对准距离传感器和反射镜

根据下方插图通过校准支架对准距离传感器并按以下方式操作。

1. 将距离传感器和反射镜置于较小的距离上。
2. 对准距离传感器，确保光点射中反射镜的中心。
3. 增大距离传感器和反射镜之间的距离。光点必须仍然射中反射镜的中心。必要时通过校准支架的调节螺丝进行调整对准。



在X方向对准距离传感器



在Y方向对准距离传感器

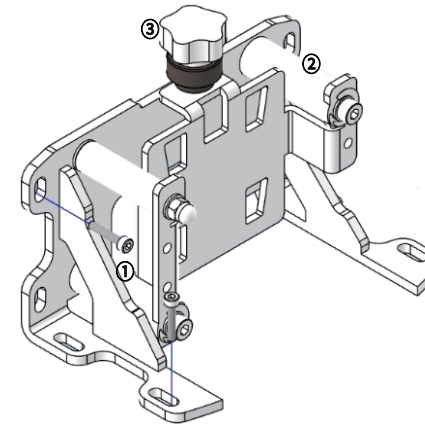
提示

将出厂时的调节螺丝设置最多改变 ± 3 mm。如此即可得到 41.5 ± 3 mm 的弹簧行程。这可得出 $\pm 2^\circ$ 的最大X方向调节角度和 $\pm 3.5^\circ$ 的最大Y方向调节角度。

3.7 安装制冷设备和距离传感器

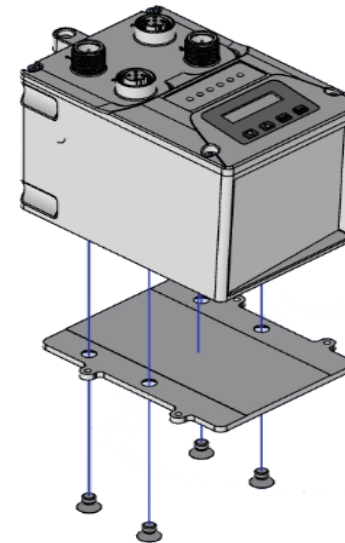
距离传感器通过选配的校准支架及制冷设备安装，校准支架适合于水平和垂直平面上的安装

1. 用附带的螺钉通过四个长孔安装校准装置。



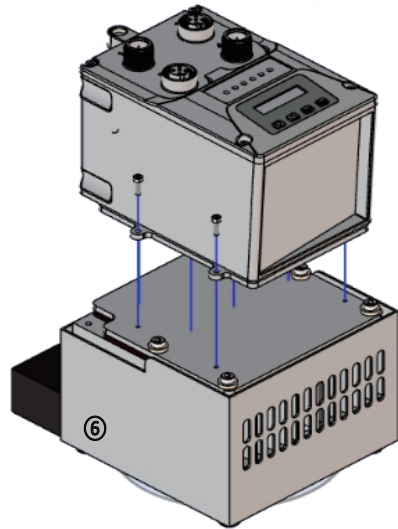
- ① 安装螺丝，M5 内六角
- ② 调节弹簧
- ③ 星形手柄螺栓

2. 将钣金整机固定板组装到距离传感器上，注意组装方向



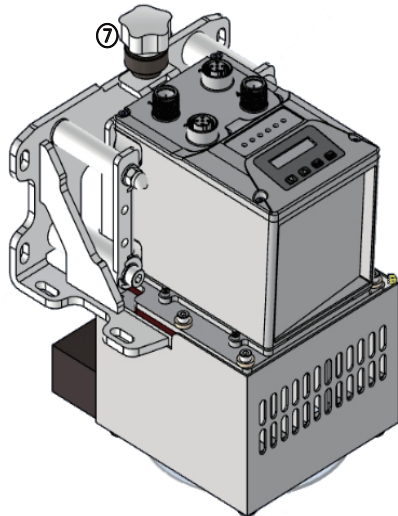
- ④ 距离传感器
- ⑤ 钣金整机固定板

3. Assembling the distance sensor with the refrigeration unit.



⑥ Refrigeration unit

- ④ Loosen the Torx handle bolt.
- ⑤ Thread the distance sensor through the calibration bracket.
- ⑥ Secure the distance sensor with the Torx handle bolt.
- ⑦ Tighten the knurled nut against the Torx handle bolt.

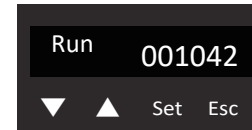


⑦ knurled nut

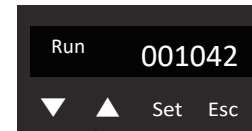
Parameter Description

1.Menu

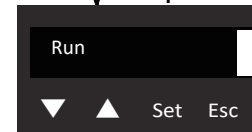
1.1 After powering on, the display defaults to showing the distance value (unit: mm), as illustrated below, indicating a measured distance of 1042 mm.



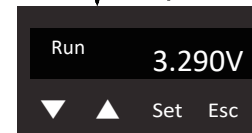
Press the ▼ and ▲ buttons to switch between different display contents.



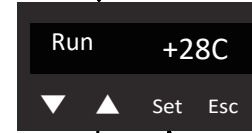
Distance Display (unit: mm)



Signal Strength Display (Bar Graph)

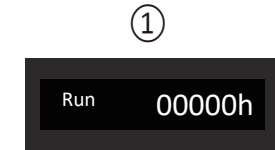


Signal Strength Display (unit: V)

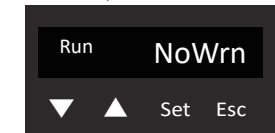


Internal Temperature Display (unit: °C)

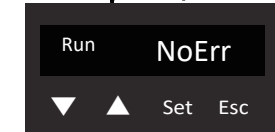
①



Laser Diode Operating Time (Unit: Hours)

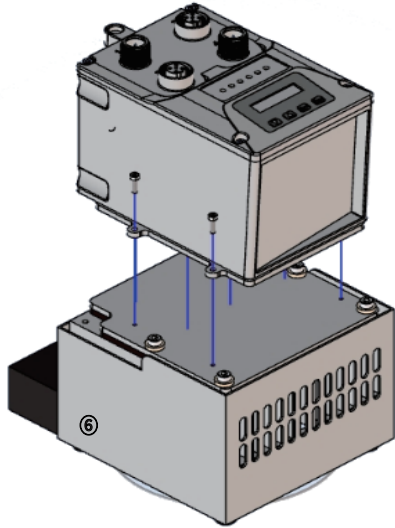


Alarm information display¹⁾



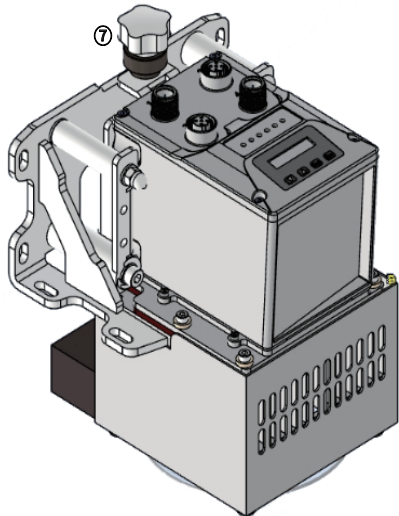
Error message display²⁾

3. 组装距离传感器与制冷设备



⑥ 制冷设备

4. 松开星形手柄螺栓。
5. 将距离传感器穿入校准支架中。
6. 用星形手柄螺栓固定距离传感器。
7. 用滚花螺母抵住星形手柄螺栓。

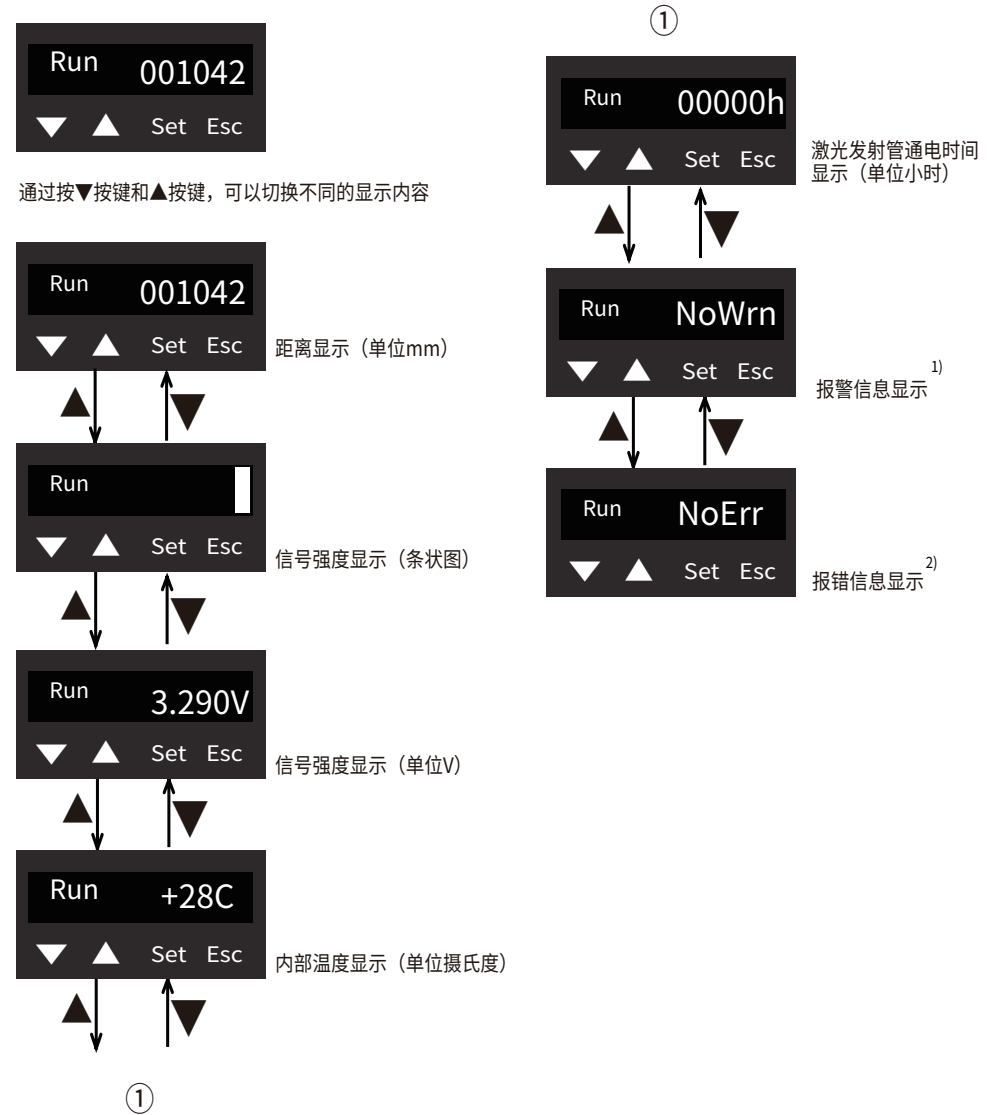


⑦ 滚花螺母

参数说明

1. 主菜单

1.1 上电后，显示屏默认显示距离值（单位mm），如下图所示，表示实测距离为1042mm。



1) The alarm information is displayed as follows:

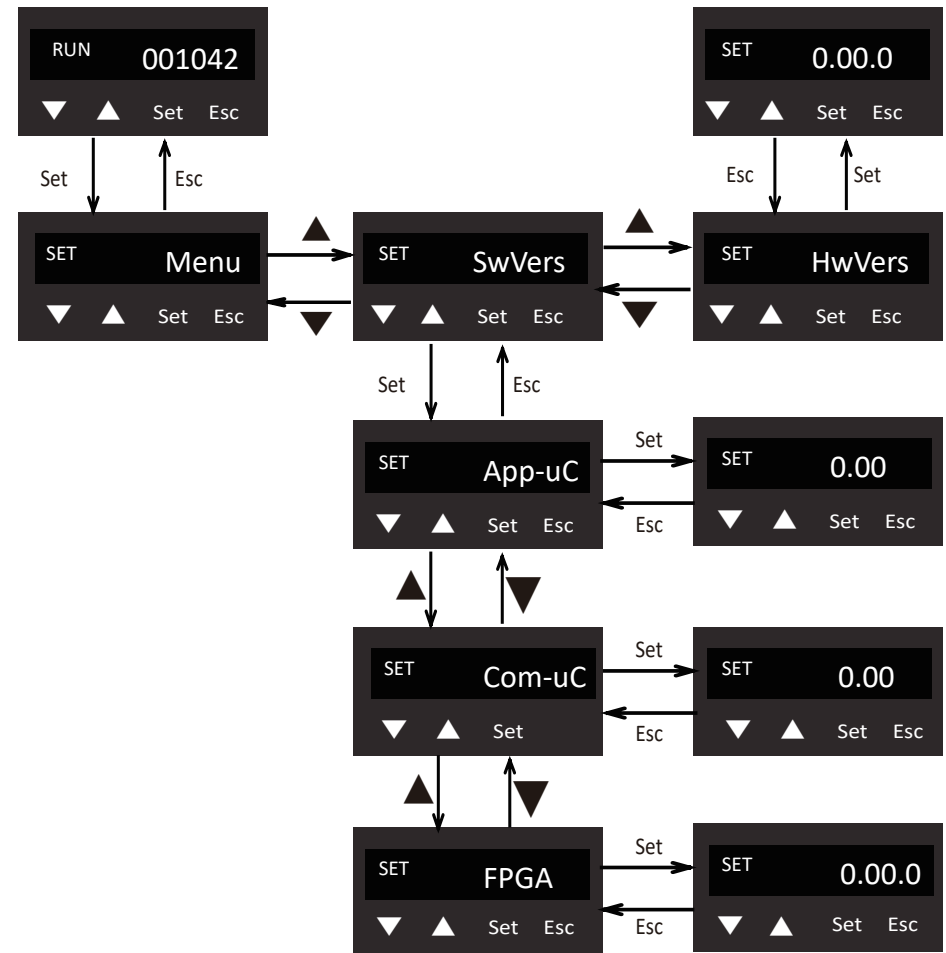
Display Content	Meaning
NoWrn	Normal state, no alarm
WrnPlb	The light spot did not fall on the retroreflective plate / affected by optical interference
WrnLsr	Fast to the laser diode's service life
WrnLvl	Lens or retroreflective plate is dirty, signal strength is below the specified alarm threshold
WrnTmp	The internal temperature of the device exceeds the range of -13°C to +60°C

2) The error message shows the following situation

Display Content	Meaning
NoErr	Normal state, no alarm
Errplb	Spot did not fall on the reflector / affected by optical interference
Errlsr	Exceeded the service life of the laser transmitter
Errlvl	Lens or reflector plate is dirty, signal strength is below the specified alarm threshold
Errtmp	Device internal temperature exceeds the range of -18°C to +65°C

1.2 Software Version Menu

Under the main menu, follow the steps below to access the software version menu.



Software and Hardware Version Menu Item

Menu Item		Meaning
SwVers	App-uC	Application software version display
	Com-uC	Communication software version display
	FPGA	FPGA software version display
HwVers		Hardware version display

1)报警信息显示分如下情况

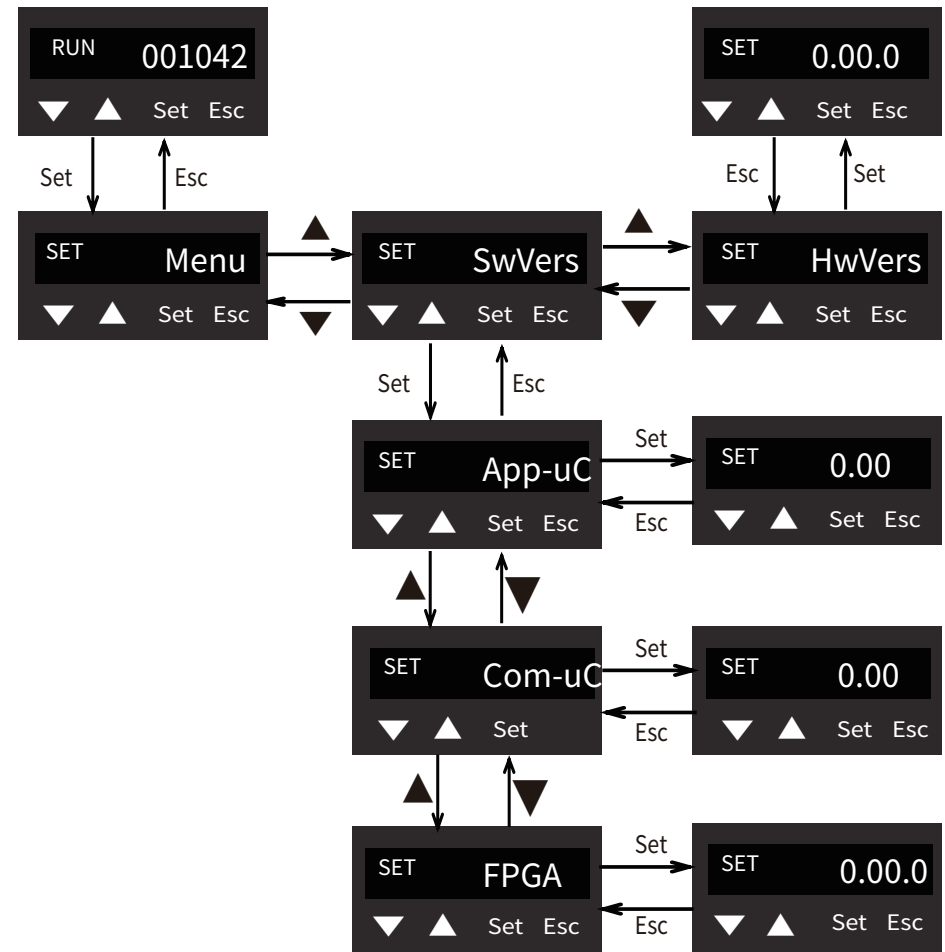
显示内容	含义
NoWrn	正常状态, 无报警
WrnPlb	光斑没有落到反光板/受光学串扰
WrnLsr	快到激光发射管使用寿命
WrnLvl	镜头或反射板脏污, 信号强度低于规定报警阈值
WrnTmp	设备内部温度超过-13°C~+60°C的范围。

2)报错信息显示分如下情况

显示内容	含义
NoErr	正常状态, 无报错
Errplb	光斑没有落到反光板/受光学串扰
Errlsr	超出激光发射管使用寿命
Errlvl	镜头或反射板脏污, 信号强度低于规定报警阈值
Errtmp	设备内部温度超过-18°C~+65°C的范围

1.2 软件版本菜单

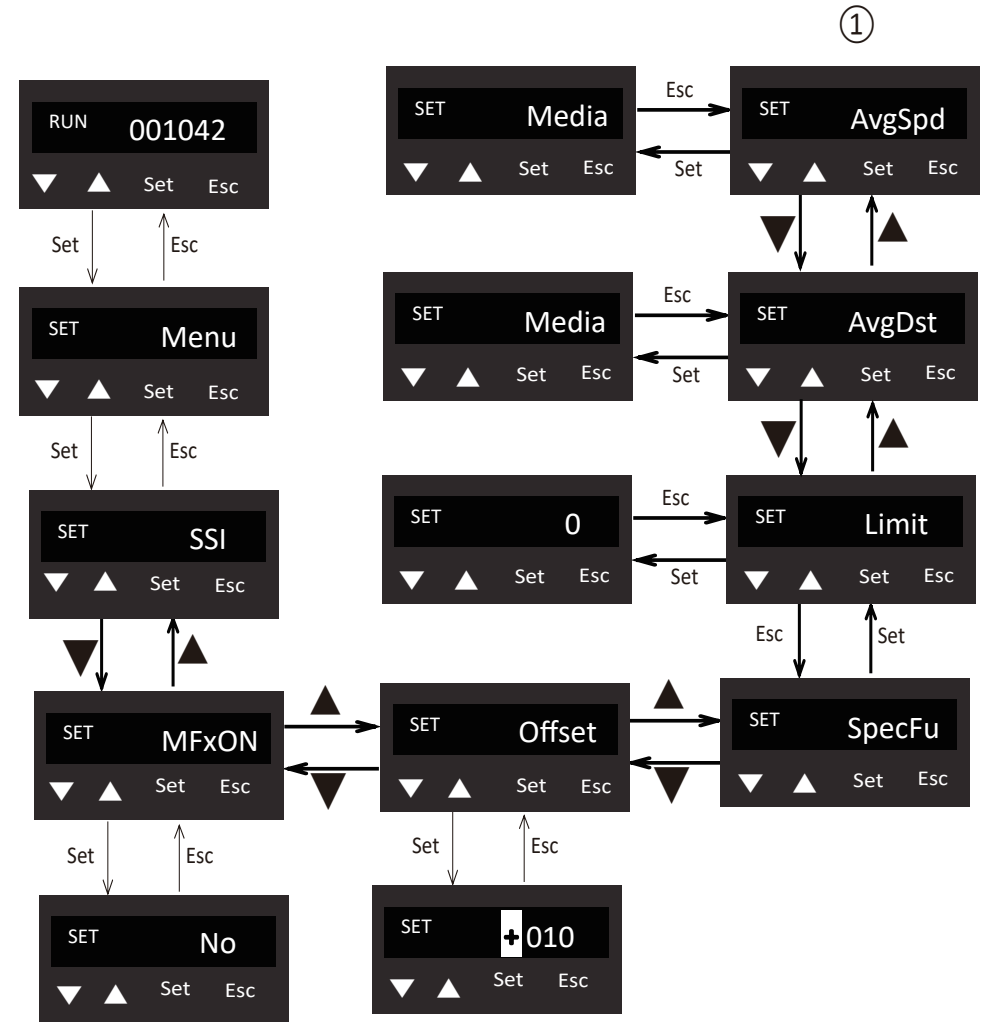
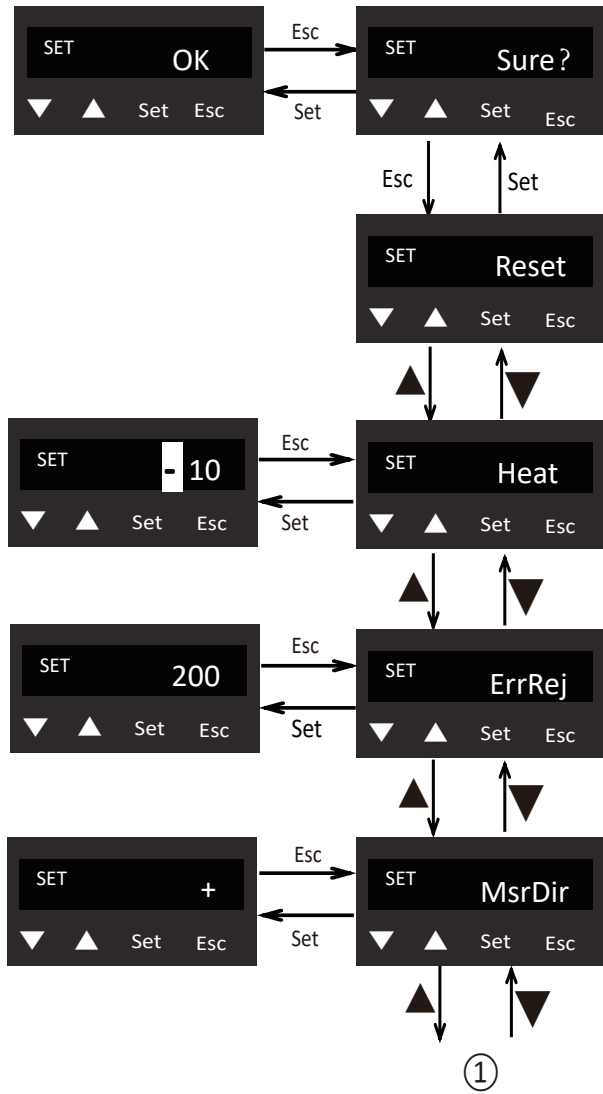
在主菜单下, 按如下操作可进入软件版本菜单



菜单项	含义	
SwVers	App-uC	应用软件版本显示
	Com-uC	通讯软件版本显示
	FPGA	FPGA软件版本显示
HwVers	硬件版本显示	

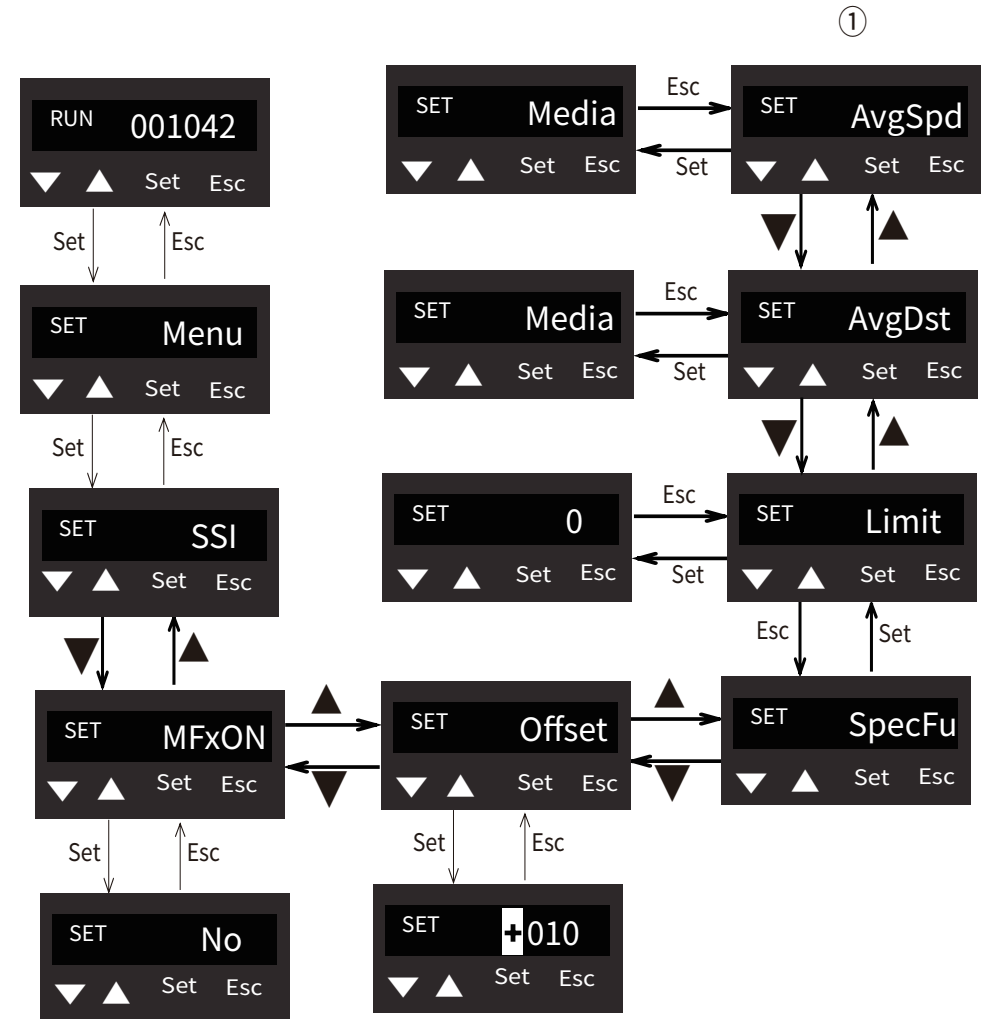
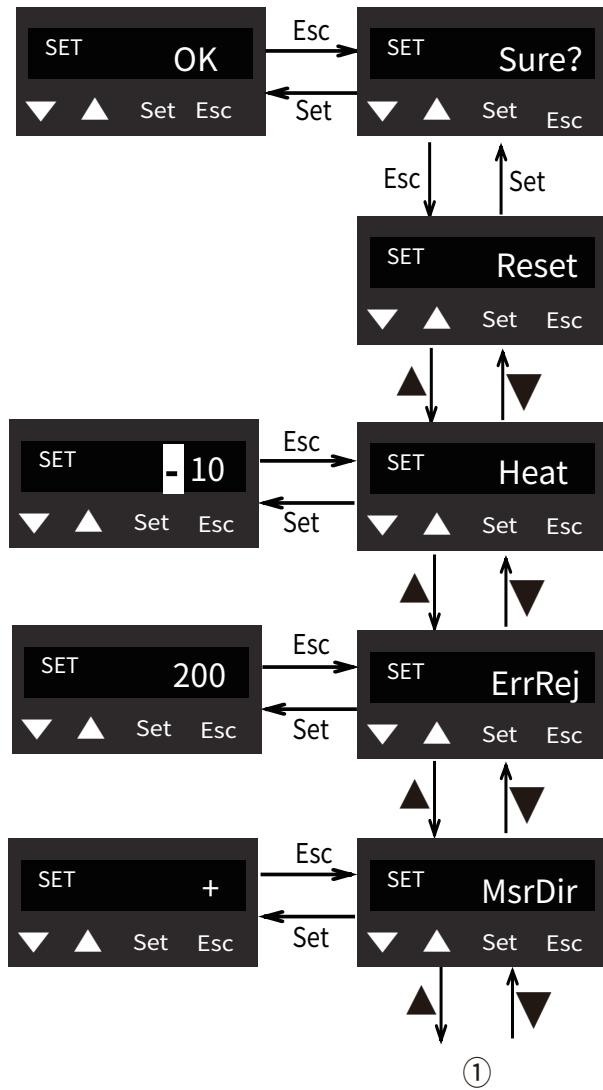
1.3 Function Menu

Under the main menu, follow the steps below to access the function menu.



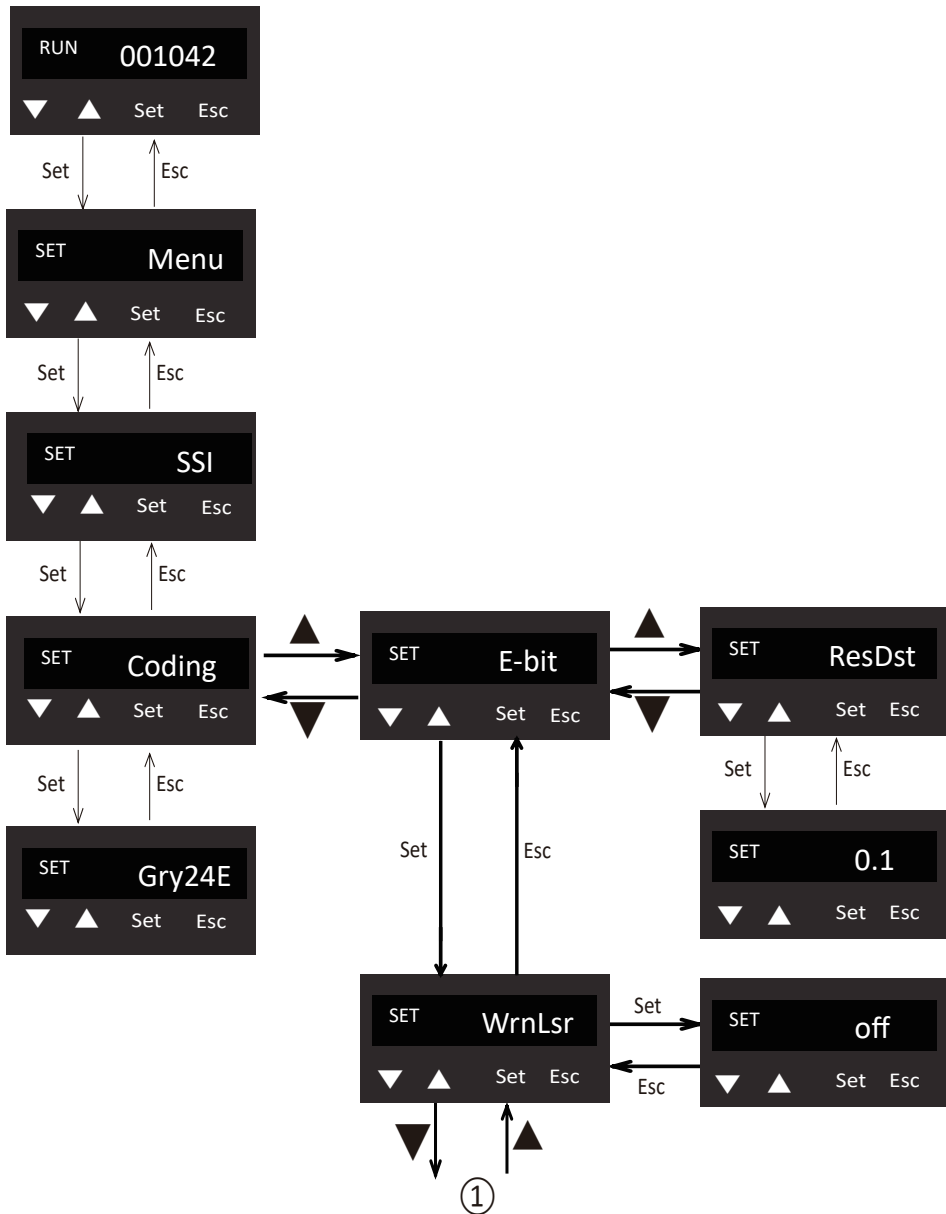
1.3 功能菜单

在主菜单下，按如下操作可进入功能菜单。

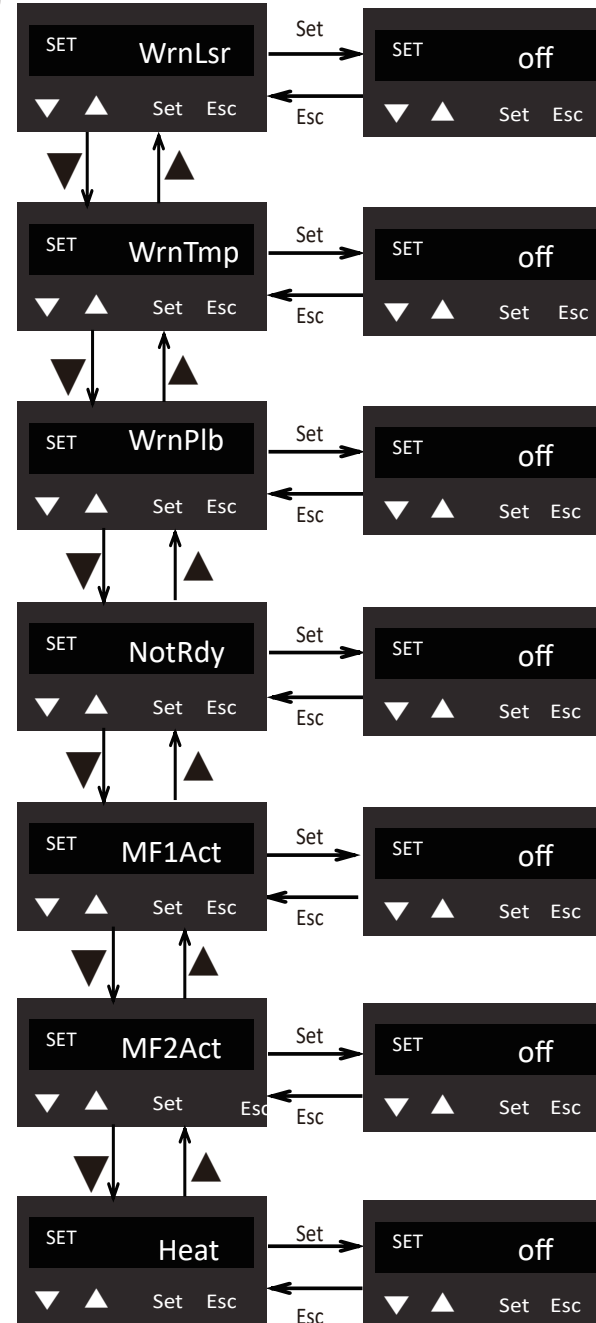


1.4 SSI Menu

Under the main menu, follow the steps below to access the SSI data format menu.

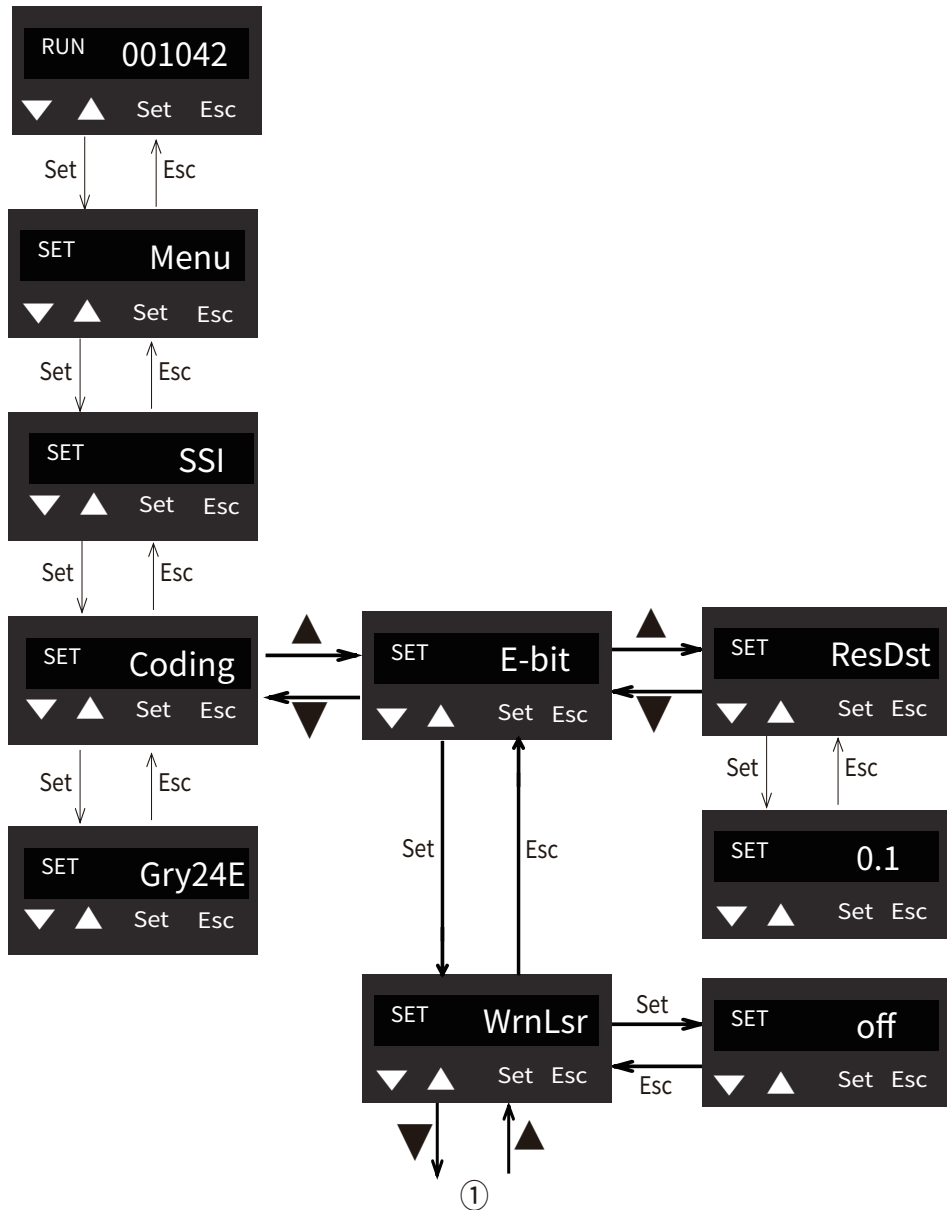


①

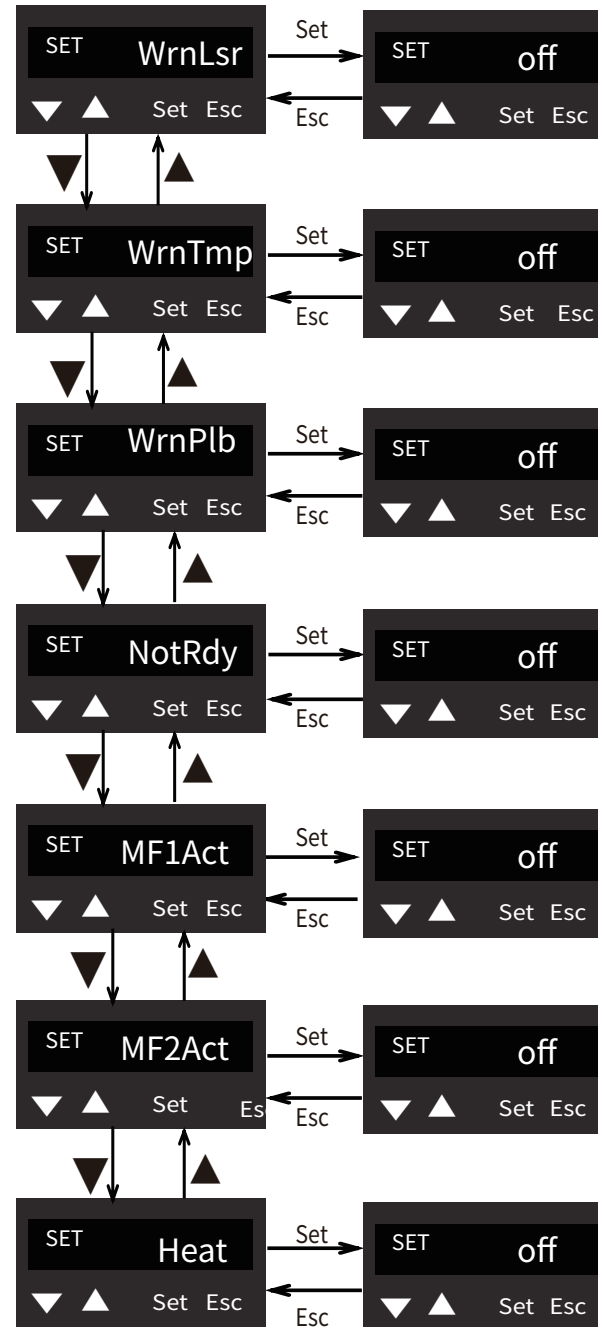


1.4 SSI 菜单

在主菜单下，按如下操作可进入SSI数据格式菜单。



①



Menu Item	Meaning
Coding	Set the SSI protocol format options: - Gry24E: 24-bit Gray code represents distance value + 1 bit binary represents status (default) - Gry24: 24-bit Gray code represents distance value - Gry25: 25-bit Gray code represents distance value - C24E: 24-bit Gray code represents distance value + 5 bits binary represents status - Bin24E: 24-bit binary represents distance value + 1 bit binary represents status - Bin24: 24-bit binary represents distance value - Bin25: 25-bit binary represents distance value - E24E: 24-bit binary represents distance value + 6 bits binary represents status
WrnlSr	In Gry24E or Bin24E, the meaning of 1 bit binary status is: fast to the service life of the transmitter; options: on - enable, off - disable (default)
Wrnlvl	In Gry24E or Bin24E, the meaning of 1 bit binary status is: the mirror/reflector is dirty, the signal strength reaches the alarm threshold; options: on - enable, off - disable (default)
WrnlTmp	In Gry24E or Bin24E, the meaning of 1 bit binary status is: fast to the upper and lower limits allowed by the product design temperature; options: on - enable, off - disable (default)
WrnlPb	In Gry24E or Bin24E, the meaning of 1 bit binary status is: the spot did not fall on the reflector/optical interference (1); options: on - enable, off - disable (default)
NotRdy	In Gry24E or Bin24E, the meaning of 1 bit binary status is: internal hardware failure; options: on - enable, off - disable (default)
MF1Act	In Gry24E or Bin24E, the meaning of 1 bit binary status is: switch 1 enabled; options: on - enable, off - disable (default)
MF2Act	In Gry24E or Bin24E, the meaning of 1 bit binary status is: switch 2 enabled; options: on - enable, off - disable (default)
Heat	In Gry24E or Bin24E, the meaning of 1 bit binary status is: internal heating device enabled; options: on - enable, off - disable (default)
ResDst	Set the resolution of SSI output value. SSI output value = actual distance / selected resolution; options: 0.1: 0.1mm (默认值) 0.125: 0.125mm 1: 1mm 10: 10mm 100: 100mm

1.5 SSI Protocol

The SSI protocol can only achieve unidirectional data transmission where the rangefinder sends data to the PLC.

The data formats of the SSI protocol include the following situations:

Gry24E and Bin24E

MSB								LSB
Bit24	Bit23	Bit22	Bit21	...	Bit3	Bit2	Bit1	Bit0
D24	D23	D22	D21		D3	D2	D1	E

Gry24 and Bin24

MSB							LSB
Bit23	Bit22	Bit21	Bit20	...	Bit2	Bit1	Bit0
D24	D23	D22	D21		D3	D2	D1

Gry25 and Bin25

MSB								LSB
Bit24	Bit23	Bit22	Bit21	...	Bit3	Bit2	Bit1	Bit0
D25	D24	D23	D22		D4	D3	D2	D1

Gry24+8 and Bin24+8

MSB													LSB
Bit31	Bit30	Bit29	Bit28	...	Bit10	Bit9	Bit8	Bit7	Bit6	...	Bit2	Bit1	Bit0
D24	D23	D22	D21		D3	D2	D1	S8	S7		S3	S2	S1

S1 ... S8 State Bit Functions

- S1: Enable the function of switch 1
- S2: Enable the function of switch 2
- S3: Internal hardware failure occurs
- S4: Internal heating device is enabled
- S5: Fast approaching the upper and lower limits allowed by temperature, signal strength is below the alarm threshold, or the spot does not fall on the reflector / suffers from optical interference
- S6: Fast approaching the service life of the laser transmitter
- S7: Temperature exceeds the allowed upper and lower limits, signal strength is below the alarm threshold, or the spot does not fall on the reflector / suffers from optical interference
- S8: Exceeds the service life of the laser transmitter

菜单项	含义
Coding	设置 SSI 协议数据格式 选项: Gry24E: 24bit 格雷码表示距离值+1bit 二进制表示状态位 (默认值) Gry24: 24bit 格雷码表示距离值 Gry25: 25bit 格雷码表示距离值 G24+8: 24bit 格雷码表示距离值+8bit 二进制表示状态位 Bin24E: 24bit 二进制表示距离值+1bit 二进制表示状态位 Bin24: 24bit 二进制表示距离值 Bin25: 25bit 二进制表示距离值 B24+8: 24bit 二进制表示距离值+8bit 二进制表示状态位
WrnLsr	设置Gry24E或Bin24E中, 1bit二进制状态位含义为: 快到发射管使用寿命 选项: on-启用 off-禁用 (默认值)
WrnLvl	设置Gry24E或Bin24E中, 1bit二进制状态位含义为: 镜头/反射板脏污, 信号强度达到报警阈值 选项: on-启用 off-禁用 (默认值)
WrnTmp	设置Gry24E或Bin24E中, 1bit二进制状态位含义为: 快到产品规定温度允许上下限 选项: on-启用 off-禁用 (默认值)
WrnPlb	设置Gry24E或Bin24E中, 1bit二进制状态位含义为: 光斑没有落到反光板/受光学串扰1) 选项: on-启用 off-禁用 (默认值)
NotRdy	设置Gry24E或Bin24E中, 1bit二进制状态位含义为: 内部发生硬件故障 选项: on-启用 off-禁用 (默认值)
MF1Act	设置Gry24E或Bin24E中, 1bit二进制状态位含义为: 开关量1启用 选项: on-启用 off-禁用 (默认值)
MF2Act	设置Gry24E或Bin24E中, 1bit二进制状态位含义为: 开关量2启用 选项: on-启用 off-禁用 (默认值)
Heat	设置Gry24E或Bin24E中, 1bit二进制状态位含义为: 内部加热装置开启 选项: on-启用 off-禁用 (默认值)
ResDst	设置SSI输出值的分辨率。SSI输出值=实测距离/选择的分辨率 选项: 0.1: 0.1mm (默认值) 0.125: 0.125mm 1: 1mm 10: 10mm 100: 100mm

1.5 SSI协议

SSI协议只能实现测距仪发送数据给PLC的单向传输, SSI协议的数据格式包括如下情况:

Gry24E和Bin24E

MSB								LSB
Bit24	Bit23	Bit22	Bit21	...	Bit3	Bit2	Bit1	Bit0
D24	D23	D22	D21		D3	D2	D1	E

Gry24和Bin24

MSB							LSB
Bit23	Bit22	Bit21	Bit20	...	Bit2	Bit1	Bit0
D24	D23	D22	D21		D3	D2	D1

Gry25和Bin25

MSB								LSB
Bit24	Bit23	Bit22	Bit21	...	Bit3	Bit2	Bit1	Bit0
D25	D24	D23	D22		D4	D3	D2	D1

Gry24+8和Bin24+8

MSB														LSB
Bit31	Bit30	Bit29	Bit28	...	Bit10	Bit9	Bit8	Bit7	Bit6	...	Bit2	Bit1	Bit0	
D24	D23	D22	D21		D3	D2	D1	S8	S7		S3	S2	S1	

S1 ... S8 状态位的功能:

- S1: 开关量1功能开启
- S2: 开关量2功能开启
- S3: 内部发生硬件故障
- S4: 加热装置开启
- S5: 温度快到允许的上下限、信号强度低于报警阈值、光斑没有落到反光板/受光学串扰
- S6: 快到激光发射管使用寿命
- S7: 温度超出允许的上下限、信号强度低于报警阈值、光斑没有落到反光板/受光学串扰
- S8: 超出激光发射管使用寿命

4. EtherNet/IP and ProfiNet

4.1 Distance sensor to PLC

The data sent by the ranging sensor to the PLC includes real - time distance, working status, and real - time speed, and occupies a total of 10 bytes.

Byte	Meaning	Data Type	Explanation Method
Byte0	Real - time distance (unit: mm)	Unsigned 32 - bit integer	Output distance [Byte0: Byte3] = actual distance / resolution. For example: Byte0 = 0x00, Byte1 = 0x01, Byte2 = 0x0C, Byte3 = 0x8F Output distance: 0x00010CEF = 68847 Resolution: 0.125mm Actual distance: 68847 × 0.125 = 8605.875mm Resolution setting: see the SSI menu item ResDst setting
Byte1			
Byte2			
Byte3			
Byte4	Alarm status of distance measurement	Unsigned 8 - bit integer	<ul style="list-style-type: none"> - bit7: Measurement value abnormal alarm (spot did not fall on the reflector or optical interference) - bit6: Laser transmitter life alarm (fast to transmitter life) - bit5: Signal strength alarm (mirror or reflector is dirty, signal strength reaches the alarm threshold) - bit4: Internal temperature over - limit alarm (fast to allow temperature upper and lower limits) - bit3: Measurement value abnormal alarm (spot did not fall on the reflector or optical interference) - bit2: Laser transmitter life alarm (fast to transmitter life) - bit1: Signal strength alarm (mirror or reflector is dirty, etc.) - bit0: Internal temperature over - limit alarm (exceeds allowed temperature upper and lower limits) When any bit is 1, it is in alarm or error state; when 0, it is normal
Byte5	Working status of distance measurement instrument	Unsigned 8 - bit integer	<ul style="list-style-type: none"> - bit7: 0 - internal heating device is in closed state; 1 - internal heating device is in open state - bit6: 0 - switch 1 function is in closed state; 1 - switch 1 function is in open state - bit5: 0 - switch 2 function is in closed state; 1 - switch 2 function is in open state - bit4: 0 - internal hardware status is normal; 1 - internal hardware status is faulty - bit3, bit0: reserved state
Byte6	Real - time speed (unit: mm/s)	Unsigned 16 - bit integer	Real - time speed = [Byte6: Byte7] For example: Byte6 = 0x0B, Byte7 = 0x88 Speed: 0x0B88 = 3000 (mm/s)
Byte7			
Byte8\Byte9	Reserved		

4.2 PLC to Distance sensor

PLC can send data to set the parameters of the rangefinder, which occupies 6 bytes in total.

Byte	Meaning	Data Type	Explanation Method
Byte0	Set the SSI protocol format	Unsigned 8 - bit integer	<ul style="list-style-type: none"> - bit7: bit4 represents the SSI communication data format - bit7: bit4 = 0000 → Gry24E - bit7: bit4 = 0001 → Gry25 - bit7: bit4 = 0010 → Gry24E - bit7: bit4 = 0011 → Bin24E - bit7: bit4 = 0100 → Bin24 - bit7: bit4 = 0101 → Bin25 - bit7: bit4 = 0110 → Bin24E - bit7: bit4 = 0111 → Bin24E - bit3: bit0 represents the SSI communication data resolution - bit3: bit0 = 0000 → Resolution is 0.1mm - bit3: bit0 = 0001 → Resolution is 0.125mm - bit3: bit0 = 0010 → Resolution is 1mm - bit3: bit0 = 0011 → Resolution is 10mm - bit3: bit0 = 0100 → Resolution is 100mm
Byte1	Set the meaning of Ebit (when the data format is Gry24E or Bin24E)	Unsigned 8 - bit integer	<ul style="list-style-type: none"> - bit7: Enable laser transmitter life alarm - bit6: Enable signal intensity alarm - bit5: Enable internal temperature over - limit alarm - bit4: Enable measurement value abnormal alarm - bit3: Enable internal hardware failure alarm - bit2: Enable switch 1 function - bit1: Enable switch 2 function - bit0: Enable internal heating device When each bit is 1, it is enabled; when 0, it is disabled
Byte2	Real - time speed (unit: mm/s)	Unsigned 16 - bit integer	Offset setting. For example, if the offset is set to 300mm, Byte2 = 0x01 and Byte3 = 0x2C (Note: The offset setting range is -300mm ~ +600mm)
Byte3			
Byte4	Reserved		
Byte5	Fixed value	Unsigned 8 - bit integer	Fixed value: 0xE5

4.EtherNet/IP 和 ProfiNet

4.1测距仪到PLC

测距仪发送给PLC的数据，包含实时距离、工作状态、实时速度，共占用10个字节。

字节	含义	数据类型	解析方法
Byte0	实时距离 (单位: mm)	无符号32位 整形数据	输出距离[Byte0: Byte3] = 实时距离 / 分辨率。 例如: Byte0=0x00, Byte1=0x01, Byte2=0x0C Byte3=0xEF 输出距离为:0x00010CEF=68847 分辨率为: 0.125mm 实际距离为: 68847*0.125=8605.875(mm) 分辨率设置见: SSI菜单ResDst设置项
Byte1			
Byte2			
Byte3			
Byte4	测距仪的报警 状态	无符号8位 整形数据	bit7 测量值异常报警 (光斑没有落到反光板或受光学串扰) bit6 激光发射管寿命报警 (快到发射管寿命) bit5 信号强度报警 (镜头或反射板脏污等原因) bit4 内部温度超限报警 (快到允许温度上下限) bit3 测量值异常报错 (光斑没有落到反光板或受光学串扰) bit2 激光发射管寿命报错 (超出发射管寿命) bit1 信号强度报错 (镜头或反射板脏污等原因) bit0 内部温度超限报错 (超出允许温度上下限) 以上各bit为1时, 为报警或报错状态, 为0时正常
Byte5	测距仪的工作 状态	无符号8位 整形数据	bit7 0-内部加热装置处于关闭状态 1-内部加热装置处于开启状态 bit6 0-开关量1功能处于关闭状态 1-开关量1功能处于开启状态 bit5 0-开关量2功能处于关闭状态 1-开关量2功能处于开启状态 bit4 0-内部硬件状态正常 1-内部硬件状态故障 bit3: bit0 保留 状态
Byte6	实时速度 (单位: mm/s)	无符号16位 整形数据	实时速度=[Byte6: Byte7] 例如; Byte6=0x0B, Byte7=0xB8 速度为0x0BB8=3000 (mm/s)
Byte7			
Byte8	预留		
Byte9	预留		

4.2 PLC到测距仪

PLC可发送数据对测距仪的参数进行设置，共占用6个字节。

字节	含义	数据类型	设置方法
Byte0	设置SSI协议 格式	无符号8位 整形数据	bit7: bit4表示SSI通讯的数据格式 bit7: bit4 =0000 Gry24E =0001 Gry24 =0010 Gry25 =0011 Gry24+8 =0100 Bin24E =0101 Bin24 =0110 Bin25 =0111 Bin24+8 bit3: bit0表示SSI通讯的数据分辨率 bit3: bit0 =0000分辨率为0.1mm =0001分辨率为0.125mm =0010分辨率为1mm =0011分辨率为10mm =0100分辨率为100mm
Byte1	设置Ebit含义 (数据格式为 Gry24E和 Bin24E时)	无符号8位 整形数据	bit7 开启激光发射管寿命报警 bit6 开启信号强度报警 bit5 开启内部温度超限报警 bit4 开启测量值异常报警 bit3 开启内部硬件故障报警 bit2 开关量2功能启用指示 bit1 开关量1功能启用指示 bit0 内部加热装置启用指示 以上各bit为1时, 为使能状态, 为0时为禁用状态
Byte2	实时速度 (单位: mm/s)	无符号16位 整形数据	偏移量设置。 如想将偏移量设为300mm, Byte2=0x01 Byte3=0x2C (注: 偏移量设置范围为-300mm~+600mm)
Byte3			
Byte4	预留		
Byte5	固定值	无符号8位 整形数据	固定值: 0xE5

The specific meanings of each menu item are as follows:

Menu Item		Meaning
SSI		SSI communication interface parameter settings, see the SSI menu for details
MFxOn		Set whether to enable the switch quantity function Options: - No - Disable (default) - Yes - Enable
Offset		Set the compensation value (unit: mm). The compensation value will be added to the measured distance value. The compensation value takes effect for all output terminals and the distance display on the screen. If the compensation value is negative, the output value will be 0. Compensation value setting range: -800 to +3001 Default value: 0
SpecFu	Limit	Set the electrical level for judging the distance display as 0, to eliminate abnormal distance values when the light spot does not fall on the reflector board. Options: - 0 - Increase by 0mV on the fixed electrical level (default) - 10 - Increase by 10mV on the fixed electrical level - 20 - Increase by 20mV on the fixed electrical level - 30 - Increase by 30mV on the fixed electrical level - 40 - Increase by 40mV on the fixed electrical level Default value: 0
	AvgDst	Set the filter level, corresponding to different Kalman filter coefficients. Options: - Fast - Fast - Media - Medium (default) - Slow - Slow Default value: Media

Menu Item		Meaning
SpecFu	AvgSpd	Set the speed filter level, corresponding to different smoothing filter depths Fast - Fast Media - Medium (default) Slow - Slow Default: Media
	MarDir	Set the measurement direction: When the measurement direction is positive (+), the distance output value equals the internal distance value measured by the measurement module. When the measurement direction is negative (-), the internal distance value will be multiplied by -1. Distance output value and speed output value change simultaneously with the direction. + (Positive direction) (default) - (Negative direction) Default: + (Positive direction)
	ErrRej	Set the delay time for external output 0 after light path interruption Options: Off - Delay 5ms 50 - Delay 50ms 200 - Delay 200ms (default)
	Heat	Set the temperature for enabling the internal heating device (unit: Celsius) Setting range: -10°C to +40°C ¹⁾ Default: -10°C
Reset		Reset all menu parameters to factory settings

1)

Translation of the Setup Method

The current position to be set is highlighted. Press ▲ or ▼ to switch the symbol or number to be set. Press Set to switch to the next position, and the next position will be highlighted at the same time. After reaching the last position, press Set to save the settings. If you press Esc during the process, the settings will be invalid.

各菜单项具体含义如下:

菜单项		含义
SSI		SSI通讯接口参数设置, 具体见SSI菜单
MFxOn		设置是否开启开关量功能 选项: No-不开启 (默认值) Yes-开启
Offset		设定补偿值(单位mm)。补偿值将被加到测定的距离值中。 补偿值对所有输出端和对显示屏的距离显示起作用。 如果补偿后为负值, 将输出数值 0。 补偿值的设置范围 -600到+3001) 默认值0
SpecFu	Limit	设置判定距离显示为0的电平范围, 用于消除光斑没有落到反光板时出现的异常测距值 0-在固化的电平值上提高0mV (默认值) 10-在固化的电平值上提高10mV 20-在固化的电平值上提高20mV 30-在固化的电平值上提高30mV 40-在固化的电平值上提高40mV 默认值0
	AvgDst	设置滤波等级, 对应不同的卡尔曼滤波系数 Fast-快速 Media-中速 (默认值) Slow-慢速 默认值Media

菜单项		含义
SpecFu	AvgSpd	设置速度滤波等级, 对应不同的平滑平均滤波深度 Fast-快速 Media-中速 (默认值) Slow-慢速 默认值Media
	MarDir	设置测量方向: 测量方向为正+时, 距离输出值等于测量模块所测得的内部距离值。测量方向为负-时, 内部距离值将乘以系数-1.方向变化的同时设计距离输出值和速度输出值。 + (正方向) (默认值) - (负方向) 默认值: + (正方向)
	ErrRej	设置光路中断后数据对外输出0的延迟时间 选项: Off-延迟5ms 50-延迟50ms 200-延迟200ms (默认值)
	Heat	设定内部加热装置开启温度 (单位摄氏度) 设置范围 -10°C~+40°C ¹⁾ 默认值-10°C
	Reset	所有菜单参数复位成出厂设置

1) 设置方法:

当前待设定的位置高亮显示, 按▲或▼切换待设定的符号或数字, 按Set切换到下一位, 同时高亮显示切换到下一位置, 在最后位置按Set保存设置, 中途按Esc则设置失效。