

OSM40高精度位移传感器



产品说明:

- 激光位移传感器，655nm激光光源，全金属外壳，坚固耐用，防护性能更好，体积小，光斑小，精度高，LED显示和按键设置，接口丰富。适用制药、包装、汽车、非标设备等应用



产品特点:

- 短、中、长三种检测距离可选
- 支持开关量输出，NPN/PNP可设定
- 支持IO-LINK输出
- 支持ECO模式设定
- LED显示+示教功能
- 抗环境光能力强，紧凑尺寸
- 支持多种检测模式，多场景应用



型号	检测距离	测量中心距离	光束直径	重复精度	线性度	分辨率
OSM40-KL35CB6Q12.1/IO	25...35mm	30mm	1mm@50mm	10μm	±0.1%F.S.	0.001mm
OSM40-KL70CB6Q12.1/IO	35...70mm	50mm	1mm@50mm	30μm	±0.1%F.S.	0.01mm
OSM40-KL160CB6Q12.1/IO	60...160mm	100mm	1mm@100mm	70μm	±0.1%F.S.	0.01mm
OSM40-KL300CB6Q12.1/IO	100...300mm	200mm	1mm@200mm	200μm	±0.2%F.S.	0.1mm
OSM40-KL800CB6Q12.1/IO	150...800mm	400mm	1mm@150mm 2mm@600mm	0.5mm(≤400mm) 1mm(≤600mm) 3mm(≤800mm)	±0.2%F.S.(≤400mm) ±0.3%F.S.(≤600mm) ±0.5%F.S.(≤800mm)	0.1mm

注1：本产品为激光类产品，上电预热十分钟后使用。

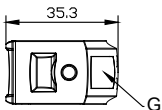
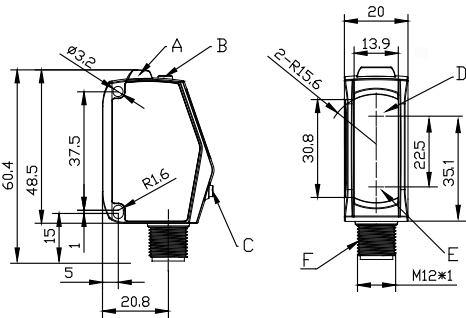
OSM40高精度位移传感器



技术参数

工作电压	10...30VDC	工作温度	-10°C ... +50°C
功率	<1W	环境照度	3000lux 以下
光源	激光 II 级 ,655nm	防护等级	IP67
控制输出	NPN/PNP可选	外壳	316L
IO-Link输出	IO-Link v1.1.2协议	窗口	玻璃
反应时间	15ms/5ms/1.5ms可选	连接形式	M12连接器

外型尺寸



- A 报警指示灯
- B 功能设置键
- C 功能调节键
- D 发射端
- E 接收端
- F M12*1连接器
- G LED显示屏

Product Description

- Laser displacement sensor ,655nm laser source,FULL Metal JACKET,durable,better protective performance,small light spot,high precision,LED display and key setting,and rich interfaces.Suitable for pharmaceutical,packing,automobile non-standard equipment and other applications.



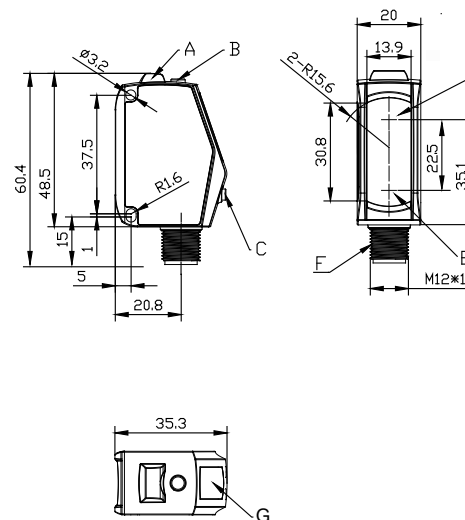
Product features:

- Short,medium and long distances are available.
- Support switch output,NPN/PNP can be set.
- Support IO-LINK output
- Support ECO mode setting.
- LED display+Teaching function
- Strong ambient light resistance and compact size
- Support multiple detection modes,multi-scene applications.

TECHNICAL SPECIFICATION

OPERATING VOLTAGE	10...30VDC	WORKING TEMPERATURE	-10°C ... +50°C
POWER SUPPLY	<1W	AMBIENT ILLUMINANCE	under 3000lux
LIGHT SOURCE TYPE	Laser class 2, 655nm	PROTECTION DEGREE	IP67
CONTROL OUTPUT	NPN/PNP can be set	HOUSING MATERIAL	316L
IO-LINK OUTPUT	IO-Link v1.1.2 protocol	WINDOWS MATERIAL	glass
RESPONSE TIME	15ms/5ms/1.5ms	CONNECTIONS	M12 Connector

DIMENSIONS



- A alarm Indicator
- B Function setting key
- C Function adjustment key
- D Transmitter
- E Receiver
- F M12*1 Connector
- G Display screen

Type	Measurement range	Measurement center distance	Beam diameter	Repeatability	Linearity	Resolution
OSM40-KL35CB6Q12.1/IO	25...35mm	30mm	1mm @50mm	10μm	±0.1%F.S.	0.001mm
OSM40-KL70CB6Q12.1/IO	35...70mm	50mm	1mm @50mm	30μm	±0.1%F.S.	0.01mm
OSM40-KL160CB6Q12.1/IO	60...160mm	100mm	1mm @100mm	70μm	±0.1%F.S.	0.01mm
OSM40-KL300CB6Q12.1/IO	100...300mm	200mm	1mm @200mm	200μm	±0.2%F.S.	0.1mm
OSM40-KL800CB6Q12.1/IO	150...800mm	400mm	1mm @150mm 2mm @600mm	0.5mm(≤400mm) 1mm(≤600mm) 3mm(≤800mm)	±0.2%F.S.(≤400mm) ±0.3%F.S.(≤600mm) ±0.5%F.S.(≤800mm)	0.1mm

Note 1: This product is a laser product, which can be used after 10 minutes of preheating after power-on.

Note 2: * M refers to the cable length in meters. If there is no * M in the model,the default cable length is 2 meters.

Tianjin Elco Automation Co.,Ltd / No.12, 4th XEDA Branch Rd,Xiqing Economic-Technological Development Area,Tianjin 300385,P.R.China

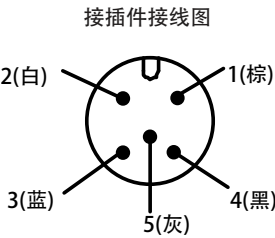
Tel: +86 22 23888288 / Fax: +86 22 23788399 / www.elco-holding.com.cn / Germany Tel: +49 70626599-260 / Germany Fax: +49 70626599-260 / Manufactured in china

Tianjin Elco Automation Co.,Ltd / No.12, 4th XEDA Branch Rd,Xiqing Economic-Technological Development Area,Tianjin 300385,P.R.China

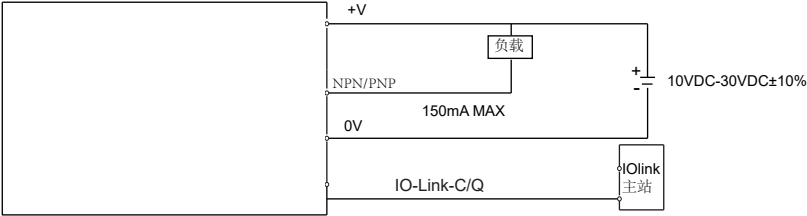
Tel: +86 22 23888288 / Fax: +86 22 23788399 / www.elco-holding.com.cn / Germany Tel: +49 70626599-260 / Germany Fax: +49 70626599-260 / Manufactured in china

接口定义和接线图

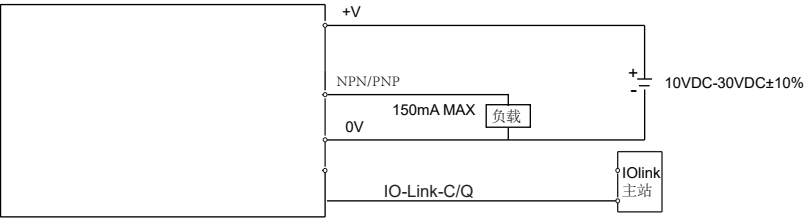
	功能	接插件式 线芯颜色
1	电源正	棕
2	NPN/PNP	白
3	电源负	蓝
4	IO-Link-C/Q	黑
5	NC	灰



接线图（NPN）



接线图（PNP）



教导模式说明

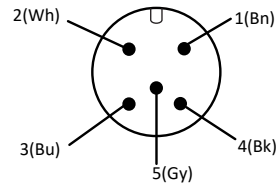
教导 检测模式设定说明： 需事先在Menu中将“检测模式设定”设为对应功能模式。	
1. 通常检测模式 在菜单中，选定“”模式，自动进入测量界面；在有效测量距离内，选定目标物体(*)，按TEACH键，提示“GOOD”，完成设置；目标物体所在位置即为判定距离。	
2. 1 点教导模式 在菜单中，选定“”模式，先进入窗口大小设置界面；设置值默认为0.5mm，按UP/DOWN调整窗口大小设置值，按TEACH键确认后进入测量界面；在有效测量距离内，选定目标物体(*)，按TEACH键，提示“GOOD”，完成设置；目标物体所在位置为中心，上下加减设置值为窗口，进行窗口模式判定；	
3. 2 点教导模式 在菜单中，选定“”模式，自动进入测量界面；在有效测量距离内，选定目标物体1(*)，按TEACH键，提示“LP1”，完成p-1设定；在有效测量距离内，选定目标物体2(*)，按TEACH键，提示“GOOD”，完成p-2设定；以目标物体1和目标物体2所在位置之间的距离为窗口，进行窗口模式判定；	
4. 3 点教导模式 在菜单中，选定“”模式，自动进入测量界面；在有效测量距离内，选定目标物体1(*)，按TEACH键，提示“LP1”，完成p-1设定；在有效测量距离内，选定目标物体2(*)，按TEACH键，提示“LP2”，完成p-2设定；在有效测量距离内，选定目标物体3(*)，按TEACH键，提示“GOOD”，完成p-3设定；以p-1和p-2的中间距离为窗口边沿1，以p-2和p-3的中间距离为窗口边沿2，进行窗口模式判定；	
5. 中点教导模式 在菜单中，选定“”模式，自动进入测量界面；在有效测量距离内，选定目标物体1(*)，按TEACH键，提示“LP1”，完成p-1设定；在有效测量距离内，选定目标物体2(*)，按TEACH键，提示“GOOD”，完成p-2设定；以p-1和p-2的中间距离为判定距离；	

*代表微调：在选定目标物体后，可通过UP/DOWN键微调目标物体距离，之后再按TEACH键确定。

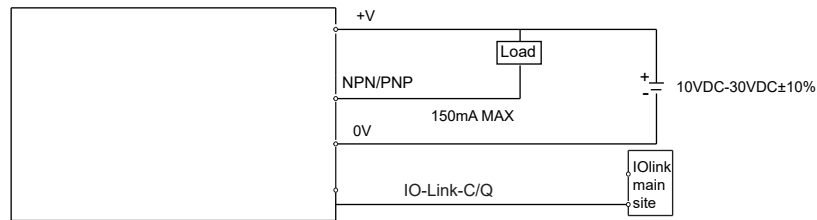
INTERFACE DEFINITION AND WIRING DIAGRAM

	Function	Connector product core color
1	Positive power supply	Brown
2	NPN/PNP	Gray
3	Power negative	Blue
4	IO-Link-C/Q	Black
5	NC	Pink

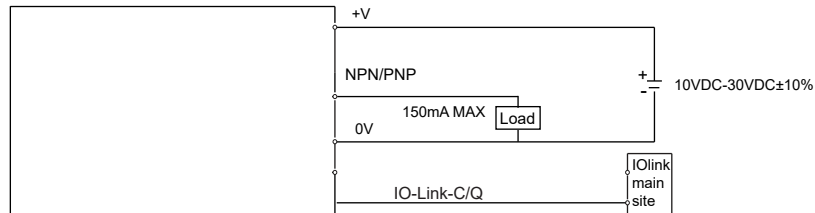
Connector wiring diagram



Wiring diagram (NPN)



Wiring diagram (PNP)



TEACHING MODE DESCRIPTION

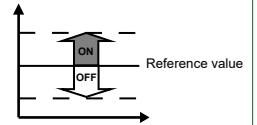
Teach

Detection mode setting description:

It is necessary to set the "Detection Mode Setting" in the menu to the corresponding function mode in advance.

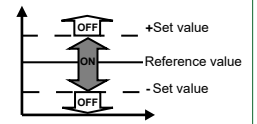
1. Normal detection mode

In the menu, select the "□" mode, automatically enter the detection interface; Select the target object(*) within the effective detection distance and press the TEACH key, and prompt "GOOD" to complete the setting. The location of the target object is the judgement distance.



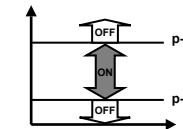
2. 1-point teaching window comparison mode

In the menu, select the "_N_1" mode, first enter the window size setting interface; The default setting value is 0.5mm, press UP/DOWN to adjust the window size setting value. Press the TEACH key to enter the measurement interface; within the effective measurement distance, select the target object(*), press TEACH key, prompt "GOOD", complete the setting. The position of the target object is the center, plus and minus setting value as window edge, and perform window mode judgement.



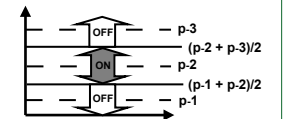
3. 2-point teaching window comparison mode

In the menu, select the "_N_2" mode, automatically enter the measurement interface. Select the target object 1(*) within the effective detection distance and press the TEACH key, and prompt "LP1" to complete p-1 setting. Select the target object 2(*) within the effective detection distance and press TEACH key, prompt "GOOD" to complete the p-2 setting. Use the distance between the location of target object 1 and target object 2 as the window to determine the window mode.



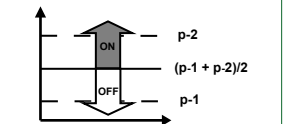
4. 3-point teaching window comparison mode

In the menu, select the "_N_3" mode, automatically enter the measurement interface. Select the target object 1(*) within the effective detection distance and press the TEACH key, and prompt "LP1" to complete p-1 setting. Select the target object 2(*) within the effective detection distance and press TEACH key, prompt "LP2" to complete the p-2 setting. Select the target object 3(*) within the effective detection distance and press TEACH key, prompt "GOOD" to complete the p-3 setting. Take the middle distance between p-1 and p-2 as window edge 1, and the middle distance between p-2 and p-3 as window edge 2, and perform window mode judgement.



5. midpoint teaching mode

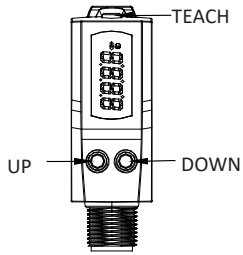
In the menu, select the "Nid" mode, automatically enter the measurement interface. Select the target object 1(*) within the effective detection distance and press the TEACH key, and prompt "LP1" to complete p-1 setting. Select the target object 2(*) within the effective detection distance and press TEACH key, prompt "GOOD" to complete the p-2 setting. Take the middle distance between p-1 and p-2 as the judgement distance.



*Represents fine adjustment: After selecting the target object, you can fine-tune the distance of the target object with the UP/DOWN key, and then press the TEACH key to confirm.

操作指南

1. 菜单操作流程



长按TEACH，进入菜单界面



2. 测距显示

测量界面：显示实际测量距离，超出检测范围时显示“----”。

3. 菜单及按键操作

3.1 进入菜单：测量界面下长按TEACH键3秒以上，进入菜单界面；

退出菜单：菜单界面下长按TEACH键3秒以上，或20秒无按键操作，返回测量界面。

3.2 菜单操作

进入菜单界面，显示主菜单；通过短按UP/DOWN键切换菜单选项；

主菜单界面，通过短按TEACH键进入相应的子菜单选项，子菜单下，短按UP/DOWN进行参数选择，在对应选项下短按TEACH键确认并返回上级主菜单；

1) 教导输出

主菜单显示“SEnS”，按TEACH进入子菜单。

子菜单项：“_r_”通常检测模式（默认）；“_N_1”1点教导窗口比较模式；

“_N_2”2点教导窗口比较模式；“_N_3”3点教导窗口比较模式；“Nid”中点教导模式”。

以上教导模式详见6.教导模式说明；

2) 设定响应速度：

主菜单显示“SPeD”，按TEACH进入子菜单；

子菜单项：“H.rSo”高精度15ms；“Std”标准5ms（默认）；“FASt”高速1.5ms；

3) 数字输出方向设定

主菜单显示“L-d”，按TEACH进入子菜单；

子菜单项：“L-on”亮通（默认）；“d-on”暗通；

4) 防抖设定

菜单显示“HySt”，按TEACH进入子菜单。

子菜单初始显示分辨率*10为迟滞距离，短按UP/DOWN时，步进距离为1个分辨率；

长按UP/DOWN键3s以上，步进距离为10个分辨率。

5) 数字输出保持设定

菜单显示“dELy”，按TEACH进入子菜单。

子菜单显示“0”无延迟，短按UP/DOWN时，步进距离10ms；

长按UP/DOWN键3s以上，步进距离100ms。设置范围0~1000ms，初始值为0ms。

6) 数字输出类型设定

主菜单显示“P-n”，按TEACH进入子菜单。

子菜单项：“nPn”NPN输出模式（默认）；“PnP”PNP输出模式；“PULL”推挽输出模式。

7) 设定显示模式

菜单显示“diSP”，按TEACH进入子菜单。

子菜单项：“norN”正常位移模式；“rEv”反转位移模式；“dist”距离模式；出厂设置默认距离模式。

8) 环保设定

菜单显示“Eco”，按TEACH进入子菜单。

环保功能说明：该功能打开后，30s无按键自动熄灭Lcd显示。

9) 外部输入设定

菜单显示“InPt”，按TEACH进入子菜单。

子菜单项：“L-oF”停止投光；“L-on”开启投光；

外部输入使能说明：外部输入为低时停止投光，无外部输入时默认开启投光。

10) 复位设定

菜单显示“rSEt”，按TEACH进入子菜单。

子菜单项：“no”不执行复位；“yES”执行复位，恢复默认设置。

3.3 按键锁定功能

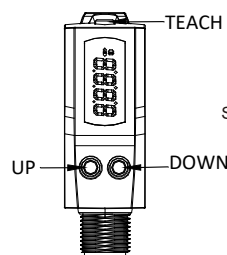
开启按键锁定：测量界面下，同时按下UP和DOWN键3秒以上，界面显示“Lc.on”，此时菜单功能失效；

关闭按键锁定：按键锁定开启后，同时按下UP和DOWN键3秒以上，界面显示“Lc.FA”，再次同时按下UP和DOWN键3秒以上，界面显示“Lc.oF”，按键功能恢复。

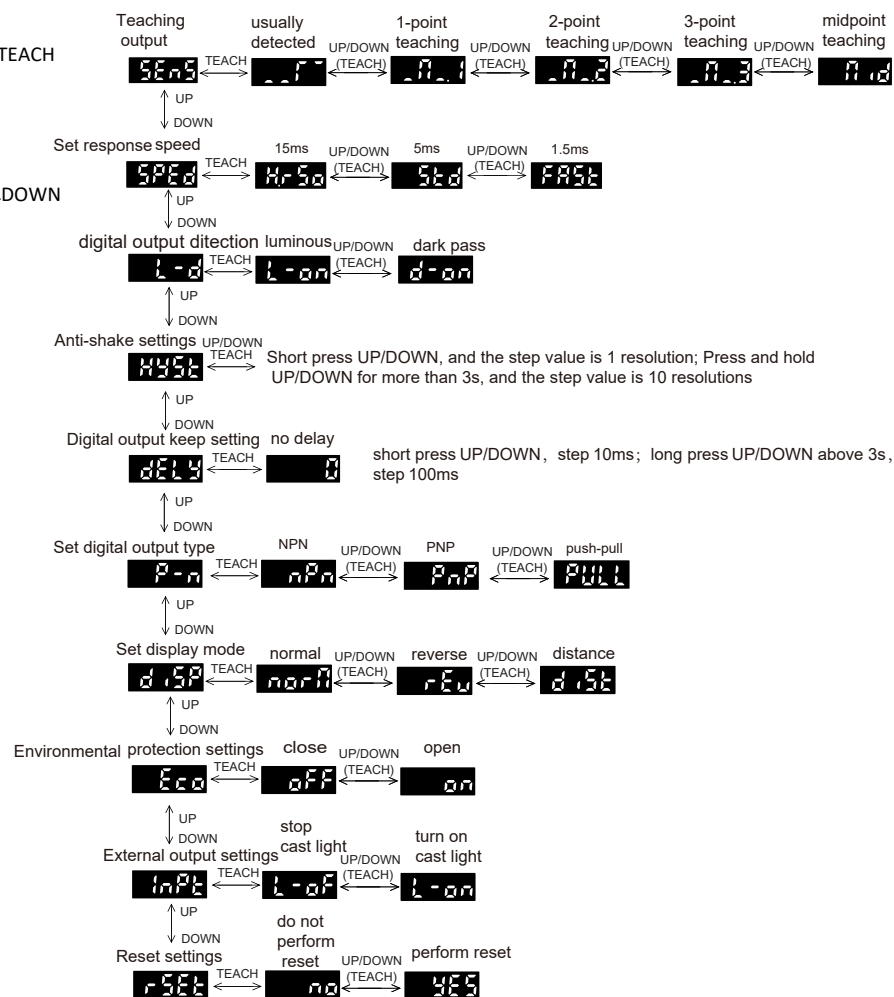
INSTRUCTION

1.Menu operation process

STEP



Long press TEACH, Enter the menu interface



2.Ranging diplay

Measurement interface: Show actual measurement distance, when the distance is out of detected distance, it displays "----".

3.Menu and key operation

3.1 Enter the menu: Long press TEACH above 3s when it is in the measurement interface, enter the menu interface;

Exit menu: Long press TEACH above 3s when it is in the menu interface, or no key operation for 20s, return to measurement interface.

3.2 Menu operation

Enter the menu interface, display the main menu, switch the menu options by pressing the up/down key.

On the main menu interface, enter the submenu options by short pressing TEACH key. Under the submenu, short press up/down to select the parameter. Short press the TEACH key to confirm and return to the previous main menu.

1)Teaching output

The main menu shows "SENs", press TEACH to enter the submenu;

Submenu items: " " usually detected mode (default); "_N_1" 1-point teaching window comparison mode;

"_N_2" 2-point teaching window comparison mode; "_N_3" 3-point teaching window comparison mode. "nid" midpoint teaching mode. The above teaching modes are detailed in 6. Teaching mode description.

2)Set response speed:

The main menu shows "SPEd", press TEACH to enter the submenu;

Submenu items: "H.rSo" high precision 15ms; "Std" standard 5ms (default); "FAST" high speed 1.5ms;

3)Set digital output detection

The main menu shows "L-d", press TEACH to enter the submenu;

Submenu items: "L-on" luminous (default); "d-on" dark pass;

4)Anti-shake settings

The main menu shows "HySt", press TEACH to enter the submenu;

The initial display resolution of the submenu * 10 is the hysteresis distance. When pressing UP/DOWN briefly, the step distance is 1 resolution; Press and hold the UP/DOWN key for more than 3s, and the step distance is 10 resolutions.

5)Digital output keep setting

The main menu shows "dELy", press TEACH to enter the submenu;

Submenu initial display "0", no delay, short press UP/DOWN, step 10ms; long press UP/DOWN above 3s, step 100ms. Setting range is 0~1000ms, initial value is 0ms.

6)Set digital output type

The main menu shows "P-n", press TEACH to enter the submenu;

Submenu items: "nPn" NPN output mode (default); "PnP" PNP output mode. "PULL" push-pull output mode.

7)Set display mode

The main menu shows "diSP", press TEACH to enter the submenu;

Submenu items: "norN" normal displacement mode; "rEv" reverse displacement mode; "dist" distance mode;

Factory default distance mode.

8)Environmental protection settings

The main menu shows "Eco", press TEACH to enter the submenu;

Environmental protection function note: After the function is turned on, the LED will automatically turn off the display in 30s without any button.

9)External output settings

The main menu shows "InPt", press TEACH to enter the submenu;

Submenu items: "L-oF" stop cast light; "L-on" turn on cast light; "ErIg" external input (default);

External input note: When the external input is low, stop cast light, no external input, default turn on cast light.

10)Reset settings

The main menu shows "rSEt", press TEACH to enter the submenu;

Submenu items: "no" do not perform reset; "yES" perform reset, restore default settings.

3.3 Key lock function

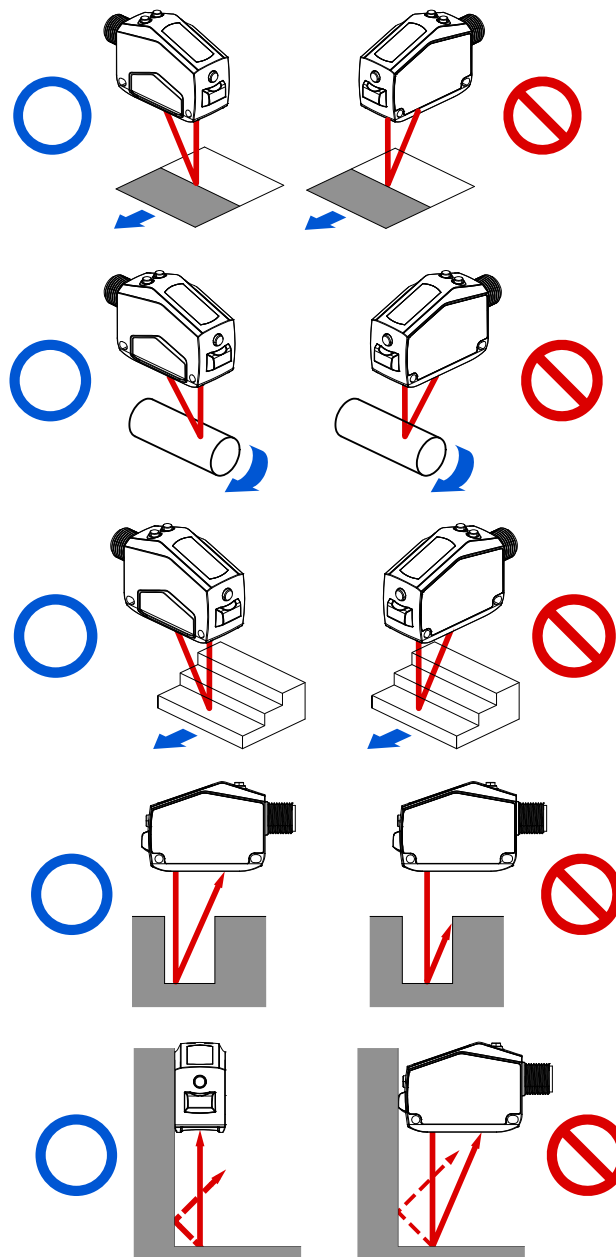
Turn on key lock: In the measurement interface, press the UP and DOWN keys at the same time for more than 3s, the interface displays "Lc.on", and the menu function is invalid at this time.

Turn off the key lock: After the key lock is turned on, press the UP and DOWN keys at the same time for more than 3s, the interface displays "Lc.FA", press the UP and DOWN keys at the same time for more than 3s again, the interface displays "Lc.oF" and the key function are restored.

数码管显示释义

[illegible]

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。

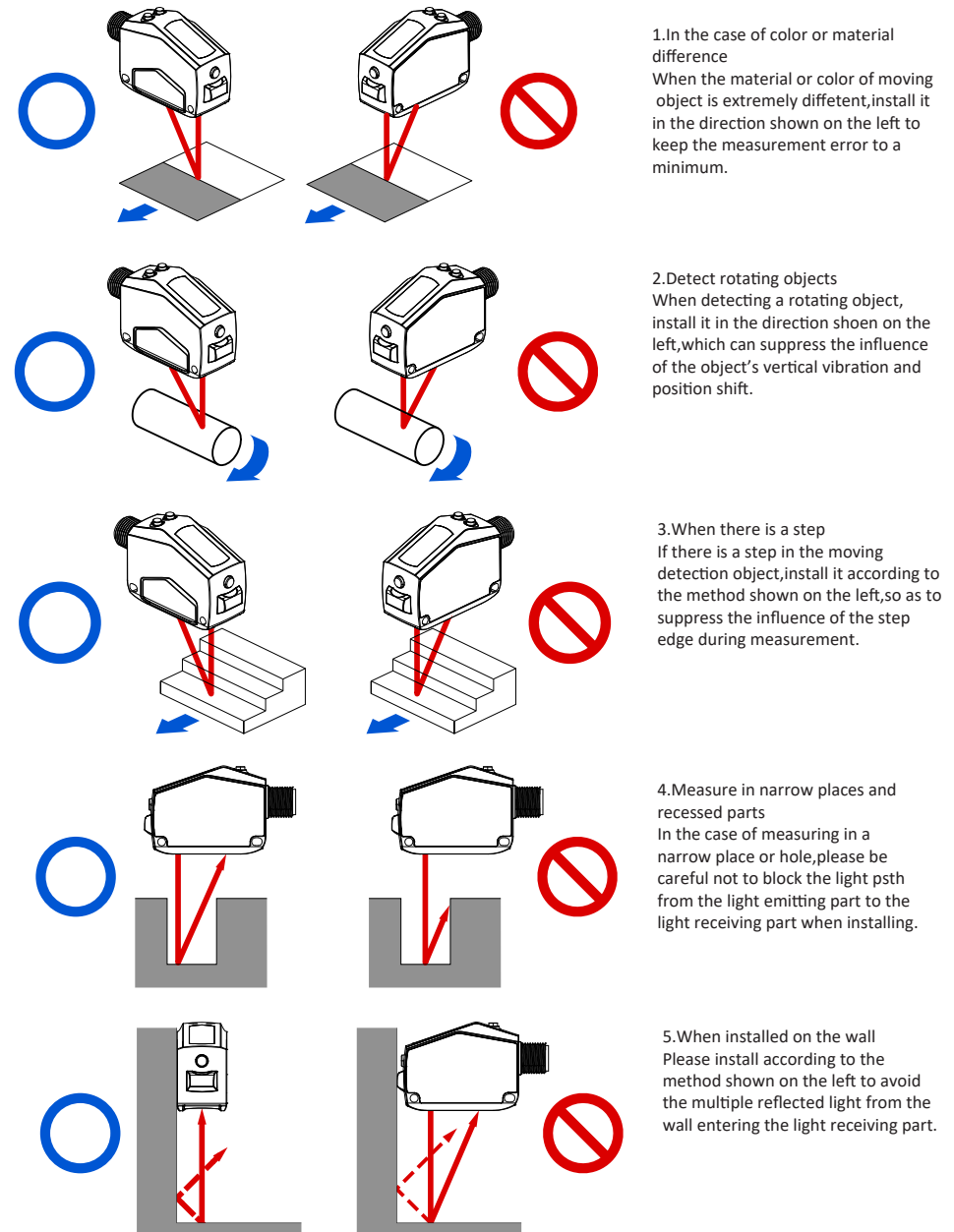
4.在狭窄场所和凹陷部分进行测量
在狭窄场所和孔中进行测量的情况下，安装时，请注意避免遮挡投光部至受光部的光路。

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。

DIGITAL TUBE DISPLAY INTERPRETATION

SEN5	sens	teaching output
_m	_m	usually detected
_m_1	_m_1	1-point teaching
_m_2	_m_2	2-point teaching
_m_3	_m_3	3-point teaching
_mid	_mid	midpoint teaching
SPED	sped	set response speed
H-RSO	h.rso	high precision 15ms
STD	std	standard 5ms
FAST	fast	high speed 1.5ms
L-d	l-d	set switch output direction
L-on	l-on	luminous
d-on	d-on	dark pass
HYST	hyst	anti-shake settings
DELY	dely	switch output keep settings
0	0	no delay
P-n	p-n	set switch output
nPN	nPN	NPN
pNP	pNP	PNP
PULL	pull	push-pull output mode
DISP	disp	set display mode
norm	norm	normal displacement mode
REV	rev	reverse displacement mode
DIST	dist	distance mode
ECO	eco	environmental protection settings
OFF	off	environmental protection close
ON	on	environmental protection open
INPT	inpt	external input setting
L-off	l-of	stop light (turn off the laser)
L-on	l-on	start light (turn on the laser)
RESET	rest	reset settings
no	no	do not perform reset
YES	yes	perform reset

INSTALLATION DIAGRAM



IO-Link v1.1.2协议

1.物理层

SIO 模式	无
最小循环时间	4.0ms
波特率	COM2
过程数据长度	2 字节
IODD 版本	V1.1
支持IO-Link版本	1.1.2

2.过程数据

Record: 2字节

位	15	14~0
类型	Boolean	Integer15
子索引	2	1

注：OSM40-KL35系列
PDin数据格式，bit15为状态指示，0：正常，1：超范围。
bit14-0为数据，数据范围15000-25000。
数据偏移10mm(即15000表示25mm,25000表示35mm)

3.ISDU (索引服务数据单元)

索引 dec(hex)	名称	格式 (Offset)	长度	读取	默认值	数值/ 范围	备注 [Unit]
16(0x10)	Vendor Name	String	4Byte	ro	ELCO		
17(0x11)	Vendor Text	String	6Byte	ro			
18(0x12)	Product Name	String	5Byte	ro			
19(0x13)	Product ID	String	5Byte	ro			
20(0x14)	Product Text	String	6Byte	ro			
24(0x18)	Application Specific Tag	String	32Byte	ro	***		

索引 dec(hex)	名称	格式 (Offset)	长度	读取	默认值	数值/ 范围	备注 [Unit]
59(0x3B)	Teach Status	Record	1Byte	ro		Bit6:Teach flag SP2 1=successfull 0=not taught or not successfull Bit4:Teach flag SP1 1=successfull 0=not taught or not successfull Bit3~0:Teach State 0=IDLE 1=SP1 SUCCESS 2=SP2 SUCCESS 3=SP12 SUCCESS 4=WAIT FOR COMMAND 5=BUSY 6= RESERVED 7=ERROR	
60(0x3C)	BCD1 SP1/ SP2	Record	4Byte	rw		Bit31~16: Setpoint SP1 (UIntegerT) Bit15~0: Setpoint SP2 (UIntegerT)	
61(0x3D)	BCD1 Confi- gura- tion	Record	4Byte	rw		Bit31~24:Switchpoint Logic 0= Light Operate 1= Dark Operate Bit23~16: BDC Mode 1= Single Point Mode 128=Window Mode Bit15~0:Hysteresis (UIntegerT, *0.1mm)	
64(0x40)	Confi- gura- tion	Record	2Byte	rw		Bit15~8:Laser Switch 0= Laser Off 1= Laser On Bit7~0:Response Speed 0= 1.5ms 1= 5ms 2=10ms	
2(0x02)	System Com- mand			wo		65=Single Value Teach SP1 67=Window Value Teach SP1 68=Window Value Teach SP2 79=Exit Teach 130=Restore Factory Settings	

IO-LINK V1.1.2 PROTOCOL

1. Physical layer

SIO Modus	no
Min Cycle Time	4.0ms
Baudrate	COM2
Process Data Length	2 Byte
IODD version	V1.1
Valid for IO-Link version	1.1.2

2. Process data

Record: 2Byte

bit	15	14~0
Type	Boolean	Integer15
Subindex	2	1

Note: OSM40-KL35 series

PDin data format, bit15 is the status indicator, 0: normal, 1: out of range.

Bit14-0 is the data, with a data range of 15000 to 25000.

Data offset 10mm (i.e. 15000 represents 25mm, 25000 represents 35mm)

3. ISDU (Index Service data unit)

Index dec(hex)	Name	Format (Offset)	Length	Access	Default Value	Value/ Range	Remark [Unit]
16(0x10)	Vendor Name	String	4Byte	ro	ELCO		
17(0x11)	Vendor Text	String	6Byte	ro			
18(0x12)	Product Name	String	5Byte	ro			
19(0x13)	Product ID	String	5Byte	ro			
20(0x14)	Product Text	String	6Byte	ro			
24(0x18)	Application Specific Tag	String	32Byte	ro	***		

Index dec(hex)	Name	Format (Offset)	Length	Access	Default Value	Value/ Range	Remark [Unit]
59(0x3B)	Teach Status	Record	1Byte	ro		Bit6:Teach flag SP2 1=successfull 0=not taught or not successfull Bit4:Teach flag SP1 1=successfull 0=not taught or not successfull Bit3~0:Teach State 0=IDLE 1=SP1 SUCCESS 2=SP2 SUCCESS 3=SP12 SUCCESS 4=WAIT FOR COMMAND 5=BUSY 6= RESERVED 7=ERROR	
60(0x3C)	BCD1 SP1/ SP2	Record	4Byte	rw		Bit31~16: Setpoint SP1 (UIntegerT) Bit15~0: Setpoint SP2 (UIntegerT)	
61(0x3D)	BCD1 Confi- gura- tion	Record	4Byte	rw		Bit31~24:Switchpoint Logic 0= Light Operate 1= Dark Operate Bit23~16: BDC Mode 1= Single Point Mode 128=Window Mode Bit15~0:Hysteresis (UIntegerT, *0.1mm)	
64(0x40)	Confi- gura- tion	Record	2Byte	rw		Bit15~8:Laser Switch 0= Laser Off 1= Laser On Bit7~0:Response Speed 0= 1.5ms 1= 5ms 2=10ms	
2(0x02)	System Com- mand			wo		65=Single Value Teach SP1 67=Window Value Teach SP1 68=Window Value Teach SP2 79=Exit Teach 130=Restore Factory Settings	