Deviation Correction Sensor ——OSC1 Controller INSTRUCTIONS

1.Product description

OSC1 controllers are used in combination with OSMT60 sensor head, with teaching mode, multiple working modes and output modes.

2.Product features

∗High-precision,sensor head and controllers are installed separately.

∗Support multiple detection modes and multiple scene applications.

∗OLED display, optional in Chinese and English.

3.Model description

Type	Output	Sensor head connection mode	Number of sensor head connections	Connection
OSC1-UC2B6-Q8/485	NPN/PNP+485	M8-4pin connector	MAX.2	2M cable

4.Technical specification

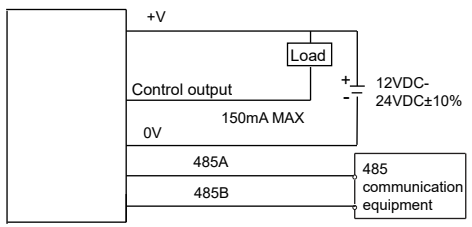
Power supply	DC 12...24V±10%	Resolution	1μm
Current consumption	≤ 200mA (DC12V)	Output modes	2*PNP/NPN options Max.100mA/DC24V; RS485
Sensor head connections	MAX 2,M8-4pin connector	Circuit protection	Reverse polarity protection,Short-circuit protection, Over-load protection
Sensor head communication	RS485	Ambient temperature	-10...+50°C/35~85%RH (No condensation or icing)
Indicator	Power:green/red Output/teaching:orange	Storage temperature	-20...+60°C/35~85%RH (No condensation or icing)
Measured value	0~9.999mm -9.999~0mm	Protection	IP50
Distance adjustment	Key setting	Housing	PC

5.Line sequence and wiring diagram

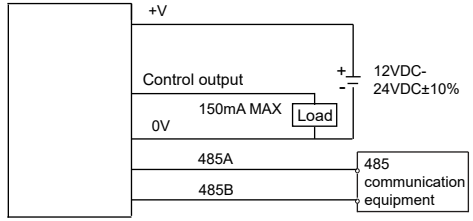
5.1Line sequence colors and definitions

	Function	Color
1	V+ 12...24VDC	Brown
2	GND	Blue
3	NPN/PNP1	Yellow
4	NPN/PNP2	White
5	485A	Pink
6	485B	Green

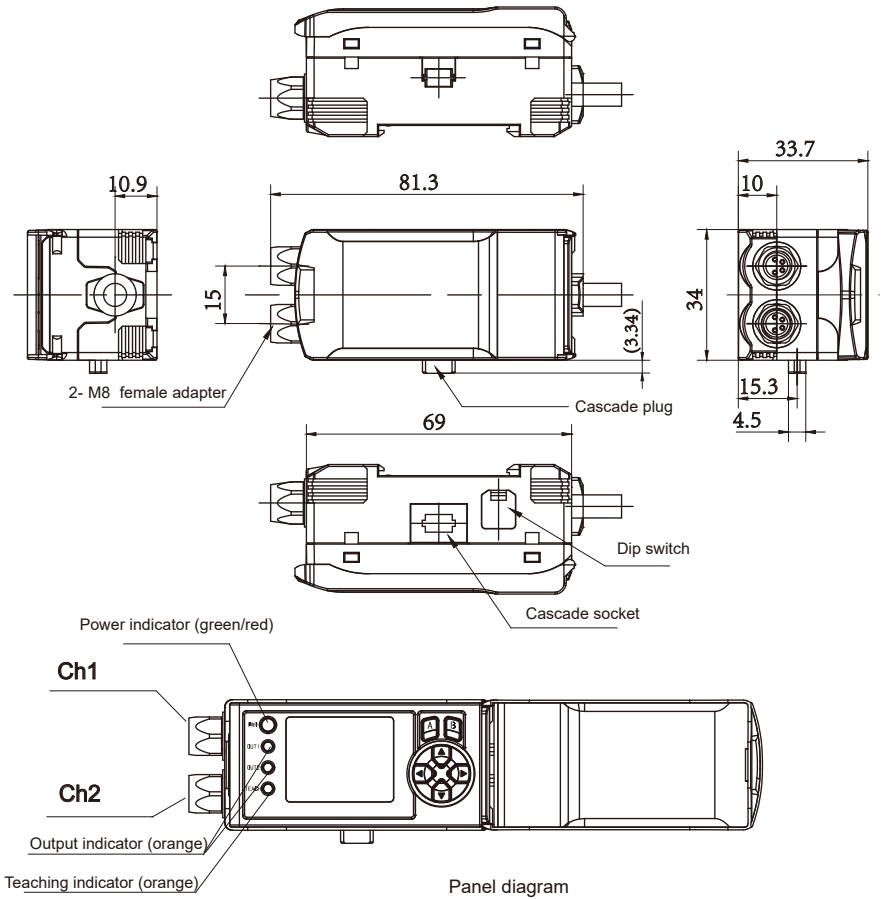
5.2Wiring diagram（NPN）



5.3Wiring diagram（PNP）



6.Dimensions

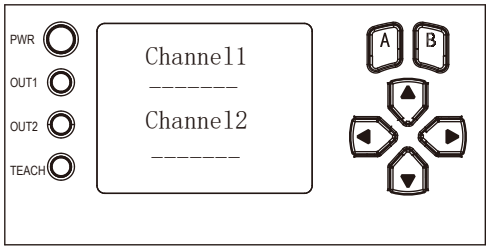


Panel diagram

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
Germany Tel：+49 70626599-260
Germany Fax：+49 70626599-261
Manufactured in China

7.Operation guide

7.1Controller operating instructions



1） Key description

There are up,down,left and right, A confirm key，B return key.

2） Dual channel display mode

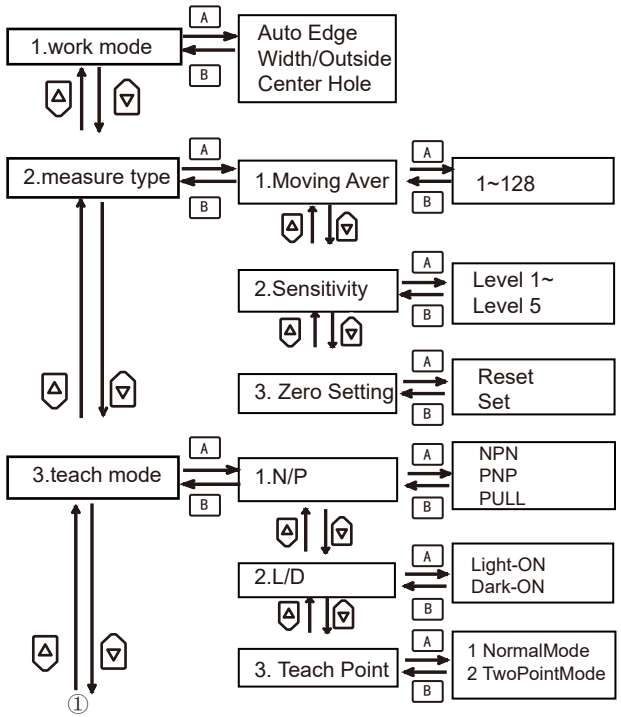
Default dual channel display mode，if it is not connected,display"---" and the power indicator is red.When a channel is connected to the sensor,the power indicator is green and the channel displays data.

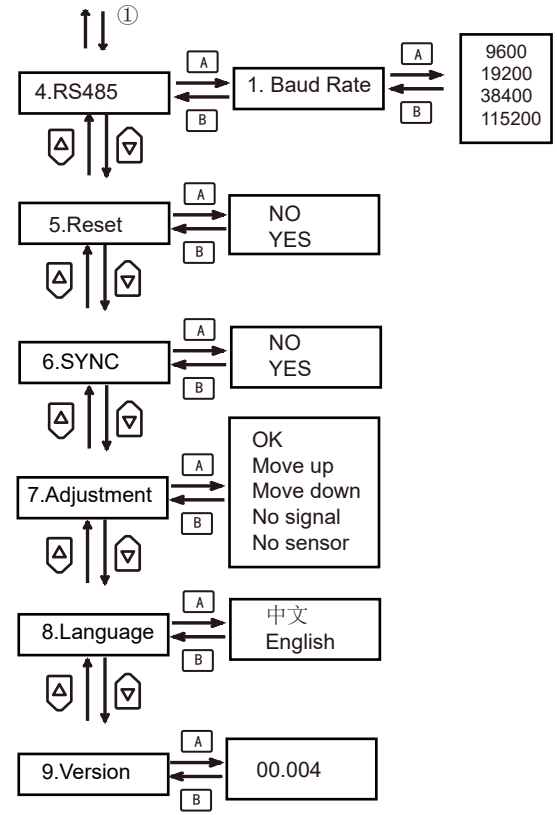
3） Display mode switching

Enter the channel selection interface through the left and right keys. Switch channels through the up and down keys, press the "A" key to confirm, and press the "B" key to return the dual channel display mode.

7.2Menu flow chart and summary

Press the up and down keys to select the channel to be set, and press the "A" key to enter the setting interface.





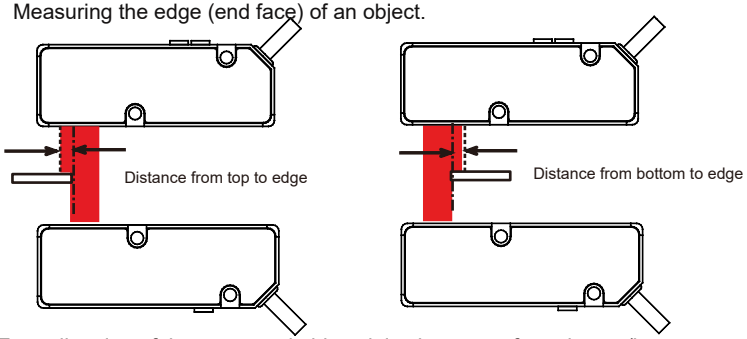
7.3 Setting instructions

7.3.1 work mode

Auto Edge(default）/Width/Outside/Center Hole

1)Auto Edge

Measuring the edge (end face) of an object.



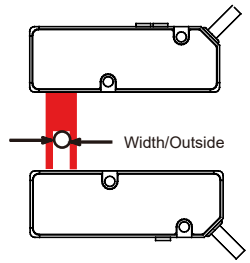
Entry direction of the measured object: it is ok to enter from the top/bottom.

When the object enters from the top of the sensor, the measured value is the distance from the top of the sensor to the edge of the object andis positive, and the displayed value is 0~9.999.When the object enters from the bottom of the sensor, the measured value is the distance from the bottom of the sensor to the edge of the object and is negative, and the displayed value is 0~-9.999.

When there are more than 2 edges in the measuring range, it cannot be measured.

2)Width/Outside

Measure the distance between two edges, such as width, outer diameter, etc.

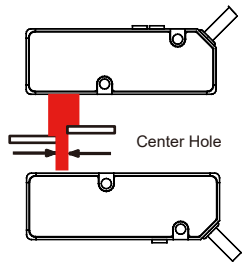


When both ends of the object are in the middle of the sensor, the measured value is its width value.

When there is only one edge in the measuring range, or there are more than three cases, it cannot be measured.

3)Center Hole

Measure the distance between two edges, such as spacing, aperture, etc.



When the object covers the sensor and the gap part is in the middle of the sensor, the working mode is selected as the Center Hole, and the measured value is its aperture value.

When there is only one edge in the measuring range, or there are more than three cases, it cannot be measured.

4)Other instructions

A.When the sensor does not detect the object, the measured value is "-----".

B.When the sensor is fully covered and does not meet the normal working scene, the measured value of 10000 indicates full occlusion.

C. When the sensor is not fully covered and does not meet the normal working scene, the measured value of 20000 indicates the use error.

7.3.2 Measurement parameter setting Moving Aver

1) Average sampling times

Sets the number of times the measured values are averaged. Increasing the set value can effectively suppress the output jitter.

It can be set to 1-128 numbers for moving average, and the default value is 10 (serving 485 communication, switch output and EC module).

When the average sampling number is set to 1, the averaging process is not performed.

When it cannot be measured, the average processing data will not be updated.

2)Sensitivity

Sensitivity can be set in five levels.

In general, the sensitivity can be detected normally in the initial state [level 3].

If the measurement is unstable due to the long distance between the receiver and the emitter, please increase the sensitivity.

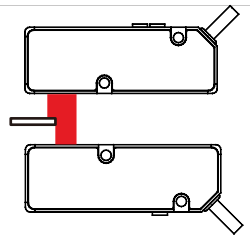
In addition, please reduce the sensitivity when the laser penetrates the object and the measurement is unstable.

3)Zero setting

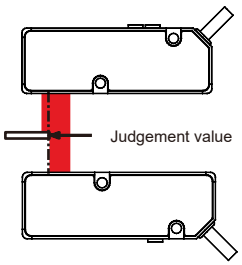
This setting is only for Auto Edge.

Set the current measured value to zero, so that the currently displayed measured value is displayed as 0.

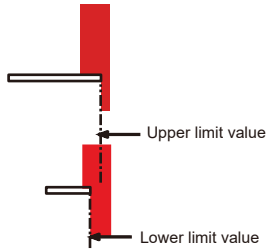
select "reset" to cancel the zero setting,restore the measured value to the actual state .



7.3.3 Teaching mode
This mode setting is suitable for switching output.
1)Output mode setting
N/PSet:can be set NPN,PNP and push-pull output.
2)Output status setting
L/DSet:can be set light on"L-ON" and dark on"D-ON".
3)Teaching mode setting
This setting can only be set in Auto Edge.
a.NormalMode (default)
Measure a single object and set a judgment value.
b.TwoPointMode
Measure two objects and set the upper and lower limits.
Used when making decisions within the upper and lower limits.



1-point teaching mode



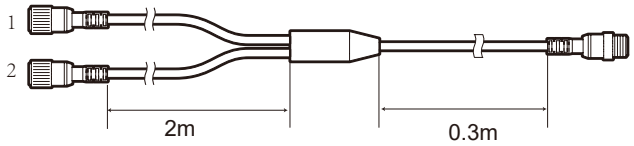
2-point teaching mode

7.3.4 485 configuration
BaudSet:9600/19200/38400/115200。
7.3.5 Reset
Reset function, which restores all configurations of this channel to factory setting mode.
Default:Auto Edge，Average sampling times is 10，sensitivity levle 3，zero setting -10/0，NPN,L-ON，P1 is 5，P2 is 0。
Remarks: Channel 1 and Channel 2 are the above default parameters.
BaudSet and Language setting have no default parameters.
7.3.6 SYNC
Synchronization, which copies the contents of another channel directly to that channel.
7.3.7 Adjustment
adjust the position according to the display prompt.
Adjust the position of the emitter, namely, up, down, OK, no signal and no sensor.
7.3.8 Language
Switch between Chinese and English.
7.3.9 Version
Query the current software version.

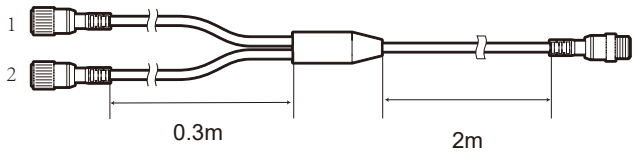
8.Optional accessories

Connecting cable between sensor and controller

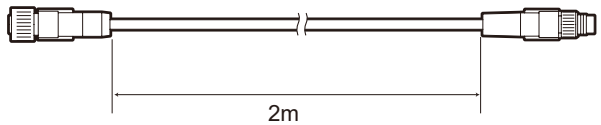
ECS-C8.4-0.3-2CO8.4-2/2/P44



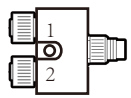
ECS-C8.4-2-2CO8.4-0.3/0.3/P44



CO8.4-2-C8.4



ECS-ECO8.4/P44



9.Cautions

- The OSC1 controller should be used in combination with OSMT60 sensor. If combination with other sensor, it may cause product failure.
- Please warm up the products for 30 minutes before use.
- Please turn off the power supply when the cable is routed or disconnect，otherwise it may cause product failure.
- Please don't connect it in parallel with the high-voltage line or power cord, otherwise the product may malfunction or be damaged due to electromagnetic induction.
- Please do not bend the cable at freezing temperature to avoid damaging the product.
- Please do not strongly impact the product or fall from a height to avoid damaging the product.
- When wiring this product with the sensor, please follow this instructions or the sensor instructions.Incorrect wiring may lead to misoperation or failure of the product or sensor.
- When the connector is exposed, do not touch the pins in the connector port, and foreign objects are prohibited from entering the interior.
- Please separate high-voltage equipment, power supply equipment, machines that generate large switching current, welding motors, welding machines and other equipment that generate interference.
- When connecting or disconnecting the cable, please apply force to the connector part, and do not apply excessive force to the cable.
- Please do not touch the product and cable with wet hands to avoid damaging the product.
- Please use the product and controller within the rated output power range.
- Please wait 3s after changing the operation settings, and then cut off the power supply.

10.485 communication instructions

10.1.Communication format

10.1.1 Modbus RTU Big-Endian

10.1.2 Communication interface:RS485 with baud rate of 115200bps(settable).
8 data bits,1 start bit,1stop bit,no parity.

10.13 Format

Serial number	Device address	Function code	Data	CRC
1	1BYTES	1BYTES	NBYTES	2BYTES(CL,CH)

Remarks:

1.Device address:

The upper 4 digits are the hardware address of the equipment, corresponding to dip switch, ranging from 0 to 7, as shown in the right table.Dials 1, 2 and 3 are address bits, and 4 is reserved bit.

The low four bits are that actual connection address,

Bit 0-3 corresponds to one channel per bit.

For example, the address of channel 1 of device 1 is 0x11;

The channel 2 address of device 7 is 0x72.

1 2 3	Equipment	1 2 3	Equipment
000	0	001	4
100	1	101	5
010	2	011	6
110	3	111	7

2. The data length is N, and the maximum length is 252.

3.CRC : using CRC16, initial value: polynomial 0xFFFF,Polynomial:0xA001 CRC is the low byte before and the high byte after.In the example, CL stands for low byte and CH stands for high byte.

10.1.4 Modbus function code description

Serial number	Function declaration	function code	explain
1	Read register	0x03	----
2	Write register	0x06	

10.1.5 Example

10.1.5.1Register reading

Serial number	Description of parameter	Data content	Explain	Example
1	Function code	0x03	Only single register reads are supported.	0x01 0x03 0x00 0x81 0x00 0x01 CL CH
2	Start address	0x0000~0xFFFF		
3	Number of registers N	0x01		

10.1.5.2Register read reply

Serial number	Description of parameter	Data content	Explain	Example
1	Function code	0x03	----	0x01 0x03 0x02 0x00 0x00 CL CH
2	Number of bytes, 1BYTE	N*2		
3	Register value	N*2 BYTES		

10.1.5.3 Single register write

Serial number	Description of parameter	Data content	Explain	Example
1	Function code	0x06	----	0x01 0x06 0x00 0x81 0x00 0x01 CL CH
2	Register address	0x0000~0xFFFF		
3	Register value	0x0000~0xFFFF		

10.1.5.4 Single register write reply

Serial number	Description of parameter	Data content	Explain	Example
1	Function code	0x06	The reply command is the same as the issue command.	0x01 0x06 0x00 0x81 0x00 0x01 CL CH
2	Register address	0x0000~0xFFFF		
3	Register value	0x0000~0xFFFF		

10.2.Register description

Serial number	Register name	Data description		
		Register address	Length (bytes)	Content
1	Dist	0x0000	2	BYTE0-1: the output result of the sensor , which is the distance value for this sensor.
2	Version	0x0080	2	Version number
3	Work mode	0x0081	2	0：Auto Edge;1：Width/Outside 2：Center Hole
4	Average sampling times	0x0082	2	Set the number from 1 to 128 for moving average.
5	Sensitivity	0x0083	2	Setting 0-4 corresponds to a sensitivity of 1-5
6	Output mode of teaching mode	0x0084	2	0：NPN;1：PNP;2：Push-pull
7	L/D mode of teaching mode	0x0085	2	0:L-ON;1:D-ON
8	P1 of teaching mode	0x0086	2	null
9	P2 of teaching mode	0x0087	2	null
10	Baud rate of RS485	0x0088	2	0:9600;1:19200;2:38400;3:115200
11	Zero setting	0x0089	2	1.Zero setting； 2.Reset
12	Data update flag bit	0x008A	2	When peripherals other than 485 modify the controller configuration, this flag bit will be set to 1, and it will be cleared automatically after query. It is suggested that 485 visit this register periodically, and synchronize all settings when there is data update before continuing to use it.

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
Germany Tel：+49 70626599-260
Germany Fax：+49 70626599-261
Manufactured in China