



YEX-S1PRO-ORP

YEX-S1PRO-ORP

Online ORP Sensor User Manual



Changsha Yex Technology Co., Ltd.

Mobile/WhatsApp: +8615111147890

Email: sales@yexsensor.com

Website: www.yexsensor.com

Address: 1303, Building A, Runjia Park Road, Yuelu District, Changsha City, Hunan Province, China





Contents

Online ORP Sensor	1
I. Product Description	3
II. Technical Parameters	3
1. Technical Parameters	3
2. Dimensional Drawing	4
III. Connection and Installation	4
1. Connection	4
2. Installation	4
IV. Maintenance and Care	5
1. Use and Maintenance	5
V. Data Communication	5
1. Communication Settings	5
2. Register	5
3. Command Example	6
VI. Calibration	7
1. Temperature Calibration	7
2. ORP Calibration	7

I. Product Description

This product is suitable for online ORP measurement in natural waters, chemical processes, industrial production, and similar applications.

Signal output: RS485 (MODBUS); 4-20 mA optional.

Electrode: High-performance electrode.

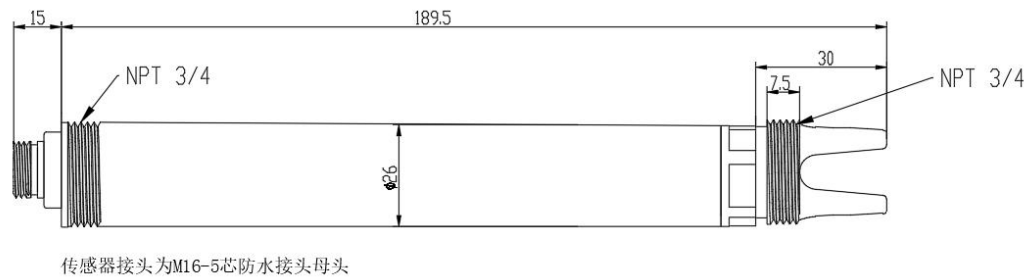
Installation: 3/4 NPT pipe thread; suitable for immersion or installation in a pipe or tank.

II. Technical Parameters

1. Technical Parameters

Model	YEX-S1PRO-ORP
Power Supply / Consumption	12-24VDC (0.4W)
ORPRange	-2000.0mV-2000.0mV
Resolution	0.1
Accuracy	±20mv, ±0.1°C
Response Time	30s
Communication Interface	RS485 (MODBUS)
Housing Material	316L+ABS
Temperature Compensation	Automatic temperature compensation
Cable	5 m four-core shielded cable
Operating Environment	Temperature: 0-50°C (non-freezing); pressure < 0.2 MPa
Ingress Protection	IP68
Installation Method	Immersion installation, NPT 3/4 thread

2. Dimensional Drawing



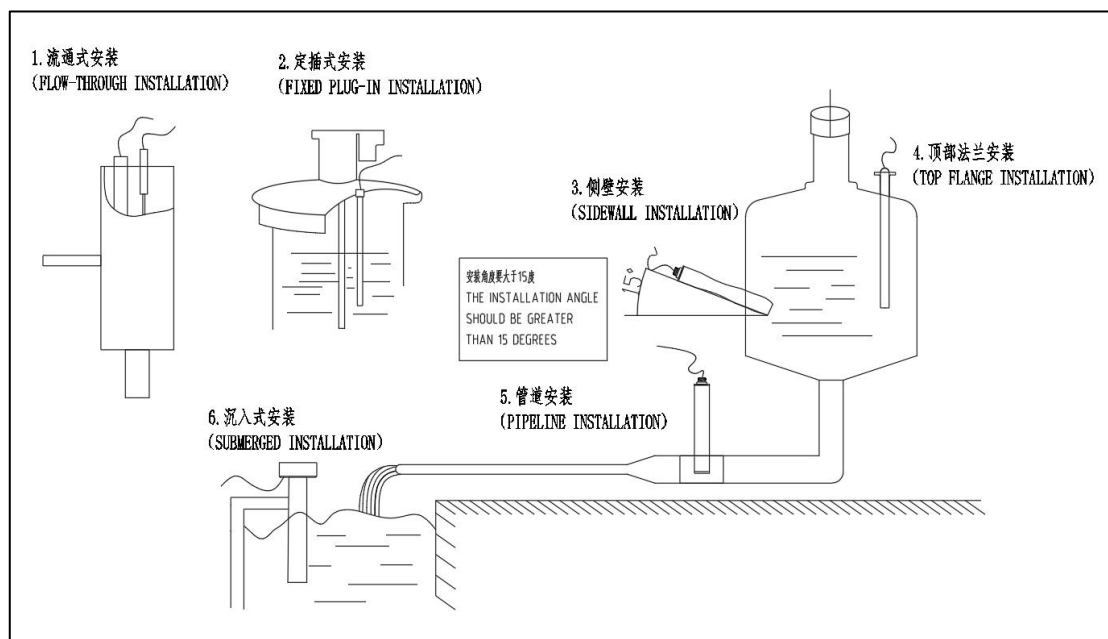
III. Connection and Installation

1. Connection

1 - Red: power positive; 2 - Black: power negative; 3 - Green: RS485-B; 4 - Yellow: RS485-A; 5 - Optional 4-20 mA output

Note: 1, 2, 3, and 4 are the pin numbers of the aviation connector. Wire colors may vary by batch; follow the markings or aviation-connector pin numbers.

2. Installation



Note: Electrochemical sensors contain liquid and must not be installed upside down or horizontally. Install at an inclination of more than 15 degrees.

IV. Maintenance and Care

1. Use and Maintenance

- Before first use, soak the sensor in 3 mol/L KCl solution for 2 hours, then rinse with deionized (or distilled) water and wipe dry for more accurate readings.
- Insert at least one-third of the sensor into the test liquid so that the electrode tip is fully immersed and the temperature measurement is more accurate.
- For long-term storage, keep the sensor immersed in 3 mol/L KCl solution. The protective cap contains KCl solution.
- Keep the terminals, probe, and aviation connector clean and clean them promptly.
- Do not leave the probe in deionized water, strong acids or alkalis, or protein solutions for extended periods, as this may damage the electrode.
- If readings become inaccurate after long-term use, calibrate the sensor according to the communication protocol.

V. Data Communication

1. Communication Settings

Baud rate: 9600; start bits: 1; data bits: 8; parity: none; stop bits: 1.

2. Register

Register	Address	Data Type	Number of Registers (bytes)	Read/Write	Description
Device Address	0x0000	Unsigned (unsigned integer)	1 (2 bytes)	R/W	1-254(default: 12) 0 is the non-response broadcast address 255 is the response general address
Product Model	0x0001	Unsigned (unsigned integer)	1 (2 bytes)	R	12
Restore Factory Settings	0x0002	Unsigned (unsigned integer)	1 (2 bytes)	R/W	Write 1 to restore factory settings; write 0 for no action;

		integer)			read has no meaning
Software Version	0x0003	Unsigned (unsigned integer)	1 (2 bytes)	R	1
Baud Rate	0x0004	Unsigned (unsigned integer)	1 (2 bytes)	R/W	Read to obtain the code; write the corresponding code to change the baud rate 0:2400, 1:4800, 2:9600, 3:19200, 4:38400, 5:115200 Other values are ignored
Reserved	0x0005				
Temperature	0x0006	Float (floating-point, CDAB)	2 (4 bytes)	R	(-40-120)°C
ORP Value	0x0008	Float (floating-point, CDAB)	2 (4 bytes)	R	(0.00-14.00)
Temperature Calibration	0x0030	Float (floating-point, CDAB)	2 (4 bytes)	W	Write the actual temperature
Direct-Write ORP K Value	0x0032	Float (floating-point, CDAB)	2 (4 bytes)	W	Write K value Default: 1.0
Direct-Write ORP B Value	0x0034	Float (floating-point, CDAB)	2 (4 bytes)	W	Write B value Default: 0.0
ORP Zero-Point Calibration	0x0036	Float (floating-point, CDAB)	2 (4 bytes)	W	Write the ORP value
ORP Slope Calibration	0x0038	Float (floating-point, CDAB)	2 (4 bytes)	W	Write the ORP value

3. Command Example

➤ Read Data



Read request : 0C 03 00 06 00 04 A5 15

Response : 0C 03 08 E0 00 41 C2 63 25 42 20 E8 04

Parsed in float CDAB format: E0 00 41 C2 = 24.36 °C, 63 25 42 20 = 40.09ORP

VI. Calibration

The sensor is factory-calibrated by default. Do not recalibrate unless necessary.

1. Temperature Calibration

Immerse more than one-third of the sensor in the test liquid and wait for the temperature reading to stabilize. Send the actual temperature to 0x0030 according to the protocol, then read the temperature to verify the calibration result.

Example: send 25.0°C

0C 10 00 30 00 02 04 00 00 41 C8 FA D1

2. ORP Calibration

➤ Two standard ORP solutions are sufficient.

1) Standard ORP solutions can be purchased directly. Select any two, for example -40 mV, 86 mV, and 256 mV.

2) **Prepare -40 mV Standard Solution**

Add 2.1 g of quinhydrone to 200 mL of pH 9.18 standard solution and mix thoroughly.

3) **Prepare 86 mV Standard Solution**

Add 2.1 g of quinhydrone to 200 mL of pH 6.86 standard solution and mix thoroughly.

4) **Prepare 256 mV Standard Solution**

Add 2.1 g of quinhydrone to 200 mL of pH 4.00 standard solution and stir thoroughly.

5) Prepare pH standard solutions using a pH buffer packet and 250 mL of distilled water to obtain pH 9.18, 6.86, and 4.00 solutions.

➤ **ORP Zero-Point Calibration**

If only one ORP solution of known value is available, perform zero-point calibration only.

Place the sensor in a solution of known value, wait for the reading to stabilize, and send the ORP value to 0x0036.



Example: send 86

0C 10 00 36 00 02 04 00 00 42 AC 7B E0

➤ **ORP Slope Calibration**

Place the sensor in a second solution of known value, wait for the reading to stabilize, and send the ORP value to 0x0038.

Example: send 256

0C 10 00 38 00 02 04 00 00 43 80 FA 21

Alternatively, write the K and B values directly.