



YEX-S1PRO-MLSS

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Online Sludge Concentration Sensor User Manual



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一. Application Environment

This product is suitable for online sludge concentration measurement in natural waters, industrial water, laboratories, municipal wastewater, and similar applications.

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

Principle: Light-scattering method.

Features: Excellent performance and high linearity.

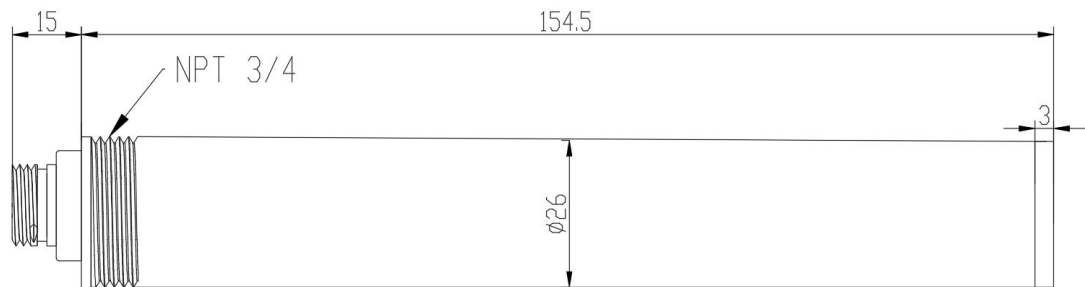
Installation: 3/4 NPT pipe thread; suitable for immersion or installation in a pipe or tank.

二. Technical Performance and Specifications

1. Technical Parameters

Model	YEX-S1PRO-MLSS
Power Supply / Consumption	12-24VDC (0.4W)
Range	0-20000 mg/L
Resolution	1
Accuracy	±5% of reading; ±0.1°C; linearity: 0.999 R ²
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
Self-Cleaning Function	Optional

2. Dimensional Drawing



传感器接头为M16-5芯防水接头母头

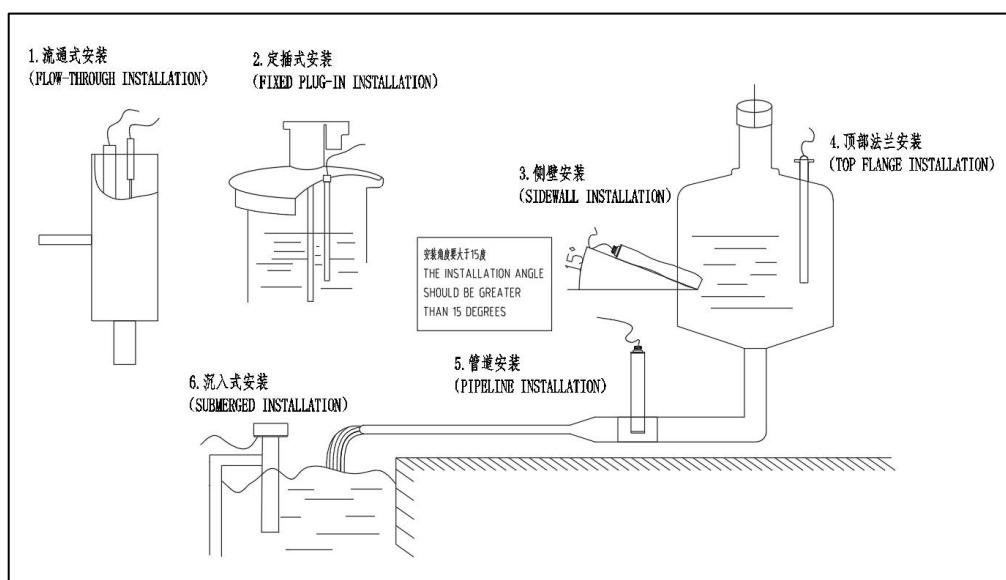
三. Connection and Installation

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.

For light-scattering products, keep the sensor window more than 10 cm from the bottom and more than 3 cm from the container walls; otherwise, reflected light may affect the reading.

四. Maintenance and Care

1. Use and Maintenance

- 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.
- Keep the terminals, probe, and aviation connector clean. Use a soft-bristled brush to clean the probe and prevent damage.
- If readings become inaccurate after long-term use, calibrate the sensor according to the communication protocol.

五. Data Communication

1. Communication Settings

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

2. Register Addresses

Register Name	Data Address	Data Type	Number of Registers (bytes)	Read/W rite	Description
Device Address	0x0000	Unsigned (unsigned integer)	1 (2bytes)	R/W	1-254(default: 10) 0 is the non-response broadcast address 255 is the response general address
Product Model	0x0001	Unsigned (unsigned integer)	1 (2bytes)	R	10

Restore Factory Settings	0x0002	Unsigned (unsigned integer)	1 (2bytes)	R/W	Write 1 to restore factory settings; write 0 for no action; read has no meaning
Software Version	0x0003	Unsigned (unsigned integer)	1 (2bytes)	R	1
Baud Rate	0x0004	Unsigned (unsigned integer)	1 (2bytes)	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			R/W	
Cleaning Interval	0x0006	(unsigned integer)	1 (2bytes)	R/W	Minutes
Cleaning Cycles	0x0007	(unsigned integer)	1 (2bytes)	R/W	
Temperature	0x0008	Float (floating-point, CDAB)	2 (4bytes)	R	(-40-120)°C
Sludge Concentration Value	0x000A	Float (floating-point, CDAB)	2 (4bytes)	R	
Temperature Calibration	0x0030	float(floating-point, CDAB)	2 (4bytes)	W	Write the actual temperature
Direct-Write K Value	0x0032	float(floating-point, CDAB)	2 (4bytes)	W	Write K value Default: 1.0
Direct-Write B Value	0x0034	float(floating-point, CDAB)	2 (4bytes)	W	Write B value Default: 0.0
Zero-Point Calibration	0x0036	float(floating-point, CDAB)	2 (4bytes)	W	Write 0 in air or purified water
Slope Calibration	0x0038	float(floating-point, CDAB)	2 (4bytes)	W	Write the known calibration value while immersed in the reference solution

3. Command Example

➤ Read Data

Read request : 0A 03 00 08 00 04 C4 B0

Response : 0A 03 08 D0 00 41 C6 2C CD 42 2A 12 BF

Parsed in float CDAB format: D0 00 41 C6 = 24.85 °C, 2C CD 42 2A = 42.54

六. Calibration

The sensor has been factory-calibrated. Recalibration is unnecessary unless required.

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

0A 10 00 30 00 02 04 00 00 41 C8 E4 59

2. Slope Calibration

Use an opaque container, preferably black. Place the sensor vertically, keeping the sensor window more than 10 cm from the bottom and more than 3 cm from the container walls.

➤ Zero-Point Calibration

Fill the container with purified water, insert the sensor, wait for the reading to stabilize, and write 0 to 0x0036.

Example: send 0

0A 10 00 36 00 02 04 00 00 00 55 B5

➤ Slope Calibration

Pour a solution of known value into the container, insert the sensor, wait for the reading to stabilize, and send the value to 0x0038.

Example: send 40.0

0A 10 00 38 00 02 04 00 00 42 20 E5 41

Alternatively, write the K and B values directly.