ECW01 Wide Range One-Body EC Transmitter user's manual Model 485



SIBO.X INDUSTRIAL CO.,LTD.
Add: No. Building 1, No. 1, Jingshi Road, Cicheng Town Industrial Park, Jiangbei District, Ningbo City, Zhejiang, China
https://www.sbxsun.com
Email: info@sbxsun.com
Tel: +86-15958288207

Table of contents

1. Product Introduction 1
1.1 Functional Features 1
1.2 Technical Parameters of Equipment 1
1.3 Product Selection 2
1.4 Product List 2
1.5 Device Dimensions 2
2. Equipment Usage Instructions 3
2.1 Wiring Instructions 3
2.2 Parameter Configuration 3
2.4 ModBus Communication and Register Details 4
4. Warranty Statement 7

1. Product Introduction

This device is a wide-range solution conductivity measurement instrument with a larger measurement range than conventional models for the same electrode type. It features automatic temperature compensation, enabling conductivity correction from ambient temperature to specified conditions. The integrated design ensures a lightweight and user-friendly structure. With IP68 waterproof rating, it is widely applicable for continuous monitoring of solution conductivity in water quality analysis, aquaculture, wastewater treatment, environmental protection, pharmaceutical, food, and tap water applications.

1.1 Functional Features

The same electrode has a wider applicable range, with a maximum conductivity measurement of 100,000 μS/cm; temperature measurement range-20~ 100℃。

The eatures an integrated design with a lightweight and simple structure for easy use.

Water resistance rating: IP68.

Has the function of converting salinity and TDS.

RS485 communication interface: The ModBus-RTU protocol enables seamless computer integration for monitoring and data exchange.

The ModBus communication address is configurable, and the baud rate is adjustable.

The operates on a wide voltage range, supporting both 7V and 30V DC power.

1.2 Technical Parameters of Equipment

Supply electricity	DC 7~30V
Power dissipation	0.4W
Ci	RS485; standard ModBus-RTU protocol; communication baud rate: default 4800 (1200,2400,4800,9600,19200,38400,57600,115200 configurable)
Conductivity measurement range	K=1: 1~10000μS/cm; resolution: 0.1μS/cm K=10:10~100000μS/cm; resolution: 1μS/cm
Conductivity measurement error	±1.5%FS
Response time	≤30S T90
Temperature measurement range	-20~ 100℃; Resolution: 0.1℃
Temperature measurement error	±0.5℃
Temperature compensation range	-20 to 100°C (default compensation temperature: 25°C)
Temperature compensation factor	Default: 0.02
Salinity measurement range	K= 1： 0~5439ppm； K= 10： 0~60292ppm
Tds measuring range	K= 1： 0~6700ppm； K= 10： 0~75000ppm
Temperature and humidity resistance of transmitter elements	-20℃~+80℃,0%RH~95%RH (no condensation)
Electrode wire length	Default: 5m (customizable to 10m,15m, or 20m)

1.3 Product Selection

ECW01-				Wide range industrial EC transducer
	N01-			RS485 (ModBus-RTU protocol)
		3-		integrated housing
			01	The electrode constant k=1
			10	The electrode constant k= 10

1.4 Product List

◆1 integrated EC transmitter

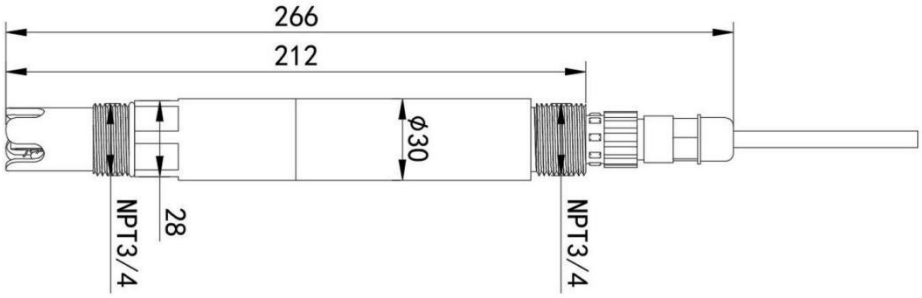
◆Certificate of Conformity, Warranty Card, etc.

◆5m (or custom length) cable

◆Corresponding standard solution for conductivity

1.5 Device Dimensions

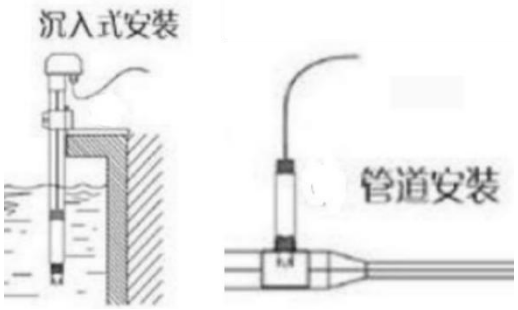
1.5.1 Equipment Dimensions



1.5.2 Electrode Installation

1. Immersion installation: The electrode leads extend through the stainless steel tube, with the 3/4 thread at the electrode's top connected to the stainless steel 3/4 thread using a raw material tape. Ensure the electrode's top and leads remain dry.

2. Pipeline installation: Connect the electrode to the pipeline using the 3/4 thread.



2. Equipment Usage Instructions

2.1 Wiring Instructions

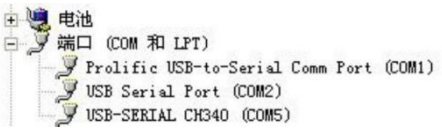
	explain	explain
source	brown	Power supply positive
	black	Power supply negative
communication	Yellow (green)	485-A
	blue	485-B

2.2 Parameter Configuration

Open the package, select "Debugging Software" → "485 Parameter Configuration Software", and open it.



1) Select the correct COM port (check COM ports in "My Computer—Properties—Device Manager—Ports"). The following figure lists the driver names for various 485 converters.



2) Connect and power on a single device. Click the test baud rate button in the software to check the device's baud rate and address. The default baud rate is 4800bit/s and the default address is 0x01.

3) Adjust the address and baud rate as needed, and check the device's current status.

4) If the test fails, check the device wiring and 485 driver installation again.



2.3 Calibration Instructions

The device with K=1 and a range of 1~10000 μS/cm was calibrated using a standard solution of 12880 μS/cm.

The device with K=10 and a range of 1~100000 μS/cm was calibrated using a standard solution of 111310 μS/cm.

During calibration, immerse the electrode in the standard solution restored to room temperature. Shake the electrode to enhance its response, ensuring the measuring section is fully submerged in the standard solution with no air bubbles adhering to the electrode. After resting until the conductivity value stabilizes, follow the register instructions and communication examples provided below to complete the calibration.

2.4 ModBus Communication and Register Details

2.4.1 Basic Parameters of Equipment Communication

code	8-bit binary
data bit	8 bits
parity check bit	not have
stop bit	1st place
error check	CRC (Cyclic Redundancy Code)
Baud rate	The factory default is 4800bit/s

2.4.2 Data Frame Format Definition

Using the ModBus-RTU communication protocol, the format is as follows: the initial structure is ≥4 bytes of time.

Address code = 1 byte Function code = 1 byte Data area = N bytes Error check = 16-bit CRC code end structure ≥4 bytes time

Address code: The unique identifier for the transmitter in the communication network (factory default: 0x01).

Function code: indicates the function of the instruction issued by the host.

Data area: This is the actual communication data. Note that the high byte of 16-bit data comes first!

CRC code: A two-byte checksum.

2.4.3 Register Address

register address	Support function code	explain
0x0000， 0x0001	0x03/0x04	Electrical conductivity value (32-bit unsigned integer, range 1 to 10000 for actual values) 10 times; the range of 10 to 100,000 is the actual value)
0x0002	0x03/0x04	Temperature (16-bit signed integer, 10 times the actual value)
0x0003， 0x0004	0x03/0x04	Salinity (32-bit unsigned integer, ppm)
0x0005， 0x0006	0x03/0x04	TDS (32-bit unsigned integer, ppm)
0x0050	0x03/0x04/ 0x06/0x10	Temperature deviation (16-bit signed integer, 10 times the actual value)
0x0051， 0x0052	0x03/0x04/ 0x10	Conductivity deviation value (32-bit signed integer, actual value when range is 1~20) 1000 times; 100 times the actual value for a range of 1 to 200; 1 to 20 00 is 10 times the actual value; the range is 10 to 20000.
0x0057， 0x0058	0x03/0x04/ 0x10	Temperature compensation coefficient of conductivity (floating point with high end)
0x0059， 0x005a	0x03/0x04/ 0x10	Electrode constant (floating-point number, high end)
0x0120 · 0x0121 · 0x0122	0x10	Calibration (write 5a5a to register 0x0120, registers 0x0121 and 0x0122) Write the 32-bit unsigned calibration standard solution value, with a range of 1 to 10000. 10 times the actual value; the range is 10 to 100,000 (actual value)
0x07D0	0x03/0x04/ 0x06/0x10	1~254 (16-bit unsigned integer, factory default is 1)
0x07D1	0x03/0x04/ 0x06/0x10	0 represents 2400 1 represents 4800 2 represents 9600 3 represents 19200 4 represents 38,400 5 represents 57,600 6 represents 115,200 7 represents 1200

2.4.4 Communication Protocol Example and Explanation

Example 1: Read the current conductivity and temperature of the device at address 01

Send frame:

address code	FC	register address	register contents	check digit bit	Check code high bit
0x01	0x03	0x00 0x00	0x00 0x03	0x05	0xcb

Response frame: (For example, a device with a range of 0~10000 μS/cm reads a conductivity value of 1502 μS/cm and a temperature of 26.5℃)

address code	FC	Valid byte count	register contents	check digit bit	Check code high bit
0x01	0x03	0x06	0x00 0x00 0x3a 0xac 0x01 0x07	0xdf	0x99

Electrical conductivity calculation: 0x3aac (hexadecimal) = 15020 => Electrical conductivity =1502.0 μS/cm

Temperature calculation: 0x107 (hexadecimal) = 263 => Temperature = 26.5°C

Example 2: Adjust the deviation value of the current conductivity for device 01

Send frame: (For a device with a current range of 0~10000 μS/cm, the output conductivity value is 990. To adjust the value to 1000, the difference is 1000-990=10. Multiply by 10 to get 100=>0x64 (hexadecimal). Write the register content as 00 64)

address code	FC	register address	register length	Byte length	register contents	check digit bit	Check code high bit
0x01	0x10	0x00 0x51	0x00 0x02	0x04	0x00 0x00 0x00 0x64	0x36	0xb4

Response frame: (a mirror message of the frame to be sent, as per the MODBUS standard)

address code	FC	register address	register length	check digit bit	Check code high bit
0x01	0x10	0x00 0x51	0x00 0x02	0x10	0x19

Example 3: Calibrate a device with address 01 and range 1~10000 using a standard solution of 12880 μS/cm.

Send frame: Write 5a5a to 0x0120, and convert 12880*10 to 16-ary to 1F720 at 0x0121 and 0x0122 respectively.

address code	FC	register address	register length	Byte length	register contents	check digit bit	Check code high bit
0x01	0x10	0x01 0x20	0x00 0x03	0x06	0x5a 0x5a 0x00 0x01 0xf7 0x20	0xa1	0xc9

Response frame: (a mirror message of the issued frame according to the ModBus standard)

address code	FC	register address	register length	check digit bit	Check code high bit
0x01	0x10	0x01 0x20	0x00 0x03	0x05	0xcb

3. Precautions and Maintenance

◆ Warning: Risk of personal injury. This equipment must not be used as a safety device or emergency stop mechanism, nor for any other purpose that may cause personal injury due to equipment failure. Usage restrictions: Use only for the intended authorized purposes. Always refer to the technical manual before installation, operation, or maintenance. Failure to comply with these guidelines may result in death or severe injury.

◆ The equipment generally requires no routine maintenance. If you notice any obvious malfunction, do not attempt to repair it yourself. Please contact us immediately!

◆ Before using the device, gently shake the conductivity electrode in the liquid to remove any trapped bubbles, then proceed with the solution conductivity measurement.

◆ Electrodes that are not in use for an extended period may generally be stored in a dry place, but must be activated by immersion in distilled water for several hours prior to use. Frequently used electrodes may be stored in distilled water.

◆ Cleaning of conductive electrodes:

The organic contaminants on the electrode can be cleaned with warm water containing detergent or alcohol.

10% citric acid is recommended for calcium and magnesium precipitates.

Electrode plates or posts can only be cleaned by chemical methods or by shaking in water. Wiping the electrode plates or posts will damage the plating layer (platinum black) deposited on the electrode surface.

◆ The device should be calibrated before each use. For long-term use, calibration is recommended every 3 months. The calibration frequency should be adjusted appropriately based on different application conditions (such as the degree of contamination in the application environment and the deposition of chemical substances).

◆ Do not immerse the plug in water before securing the cable plug to the device plug.

4. Warranty Statement

The warranty period is 24 months from the purchase date (based on valid purchase documentation). During this period, if the equipment malfunctions due to defects in its components, materials, or manufacturing processes, and the issue is verified, we will provide free repairs and replacement parts. (Note: EC electrode warranty: 12 months)

After the warranty period, we provide lifetime repair services.

The following conditions are not covered by the warranty:

1. Product damage caused by incorrect installation, use, or operation.
2. Any components of the equipment have been disassembled, repaired, modified, or replaced by non-company technicians or users.
3. Damage caused by improper use or contamination with water or other substances inside the equipment.
4. Accidents: Malfunctions or damages caused by natural disasters.
5. Malfunctions or damages caused by exceeding the operational parameters specified in the product specifications.