User Manual

BSQ-EC3 Multi-Circuit Conductivity Transmitter

Shanghai ChiMay Technology Co., Limited

www.chimaytech.com

www.shchimay.com

Content

Shanghai ChiMay Techology LTD
www.chimaytech.com / www.shchimay.com
chimay@chimaytech.com
WhatsApp/Cellphone:+86 131 1777 5471

I. Precautions Before Use:

1. Please read the relevant chapters of this manual in detail before installation and use to prevent incorrect operation, resulting in measurement errors or damage to the instrument.
2. Improper installation and unsuitable flow rate will make the measurement deviate greatly, please know the installation chapter in detail.
3. This transmitter belongs to the precision electrochemical instrumentation, which should be installed and operated by the personnel who understand and master the expertise

II. Warranty Terms:

1、The product quality guarantee period is one year from the date of purchase. (Except acidity meter and ORP electrode) During the quality assurance period, the company is responsible for free repair or replacement of the product if there is any quality problem.

The company provides lifelong maintenance service for the sold products.

Damage to the product caused by the following reasons is not covered by the warranty.

a. Burning and flooding caused by improper use and maintenance.

b. Unauthorized modifications and misuse.

c. Damage caused by the use of the environment beyond that specified for our products.

d. Collateral damage caused by improper selection.

e. cable breakage and damage caused by improper installation and use.

f. Inaccurate sensor measurement caused by private disassembly or wiring.

G. Returned products, which cannot affect the secondary sales of our company.

III. BSQ-EC3 Notes

BSQ-EC3 can realize the measurement of 2-way or 3-way conductivity value, the temperature compensation of 3-way conductivity in the transmitter share a temperature acquisition, 3-way conductivity measurement must be in the same body of water, otherwise the temperature is different, will cause the deviation of temperature compensation, resulting in measurement errors.

IV. Overview:

EC/ER/PH/ORP series transmitter is mainly used for water quality monitoring sensor signal transmission, through RS485 level to amplify the weak signal output from the sensor for transmission, which can be easily communicated with PLC, configuration software, microcontroller, etc. Communication protocol using standard MODBUS RTU protocol.

This product can be widely used in metallurgical manufacturing, electric power, light industry, textile, water treatment equipment, water pipe network and scientific research and other industrial sectors.

Shanghai ChiMay Techology LTD
www.chimaytech.com / www.shchimay.com
chimay@chimaytech.com
WhatsApp/Cellphone:+86 131 1777 5471

V. Technical indicators

- Range selection.

Serial number	Measurement Range	Mating electrodes	Precision	Interface
1	0.1～18.25MΩ (0.05 to 10.00uS)	1: 316L stainless steel insert 0.01 electrode. 2: Quick release 0.02 electrode.	2 %FS	1/2″NPT (4 points) 2 points quick coupling
2	0.1~200.0uS	316L stainless steel insertion type 0.1 electrode;		1/2″NPT (4 points)
3	0.5 to 2000uS (standard)	ABS1.0 platinum black electrode (standard). 316L stainless steel plug-in 1.0 electrode;	1.5% FS	1/2″NPT (4 points)
4	2~4000uS	ABS1.0 platinum black electrode (standard). 316L stainless steel plug-in 1.0 electrode;	1.5% FS	1/2″NPT (4 points)
5	0.5~10mS	ABS1.0 platinum black electrode (standard). 316L stainless steel plug-in 1.0 electrode;	3 % FS	1/2″NPT (4 points)
6	0.5～20mS	1: 316L stainless steel plug-in 10.0 electrode; 2: Optional PTFE + titanium 10.0 electrode.	1.5 % FS	1/2″NPT (4 points) 3/4″NPT (6 points)
7	0.5~100mS	1: 316L stainless steel plug-in 10.0 electrode; 2: Polytetrafluoro + titanium alloy 10.0 electrodes.	2 % FS	1/2″NPT (4 points) 3/4″NPT (6 points)
8	0.5~200mS	Optional PTFE + titanium 10.0 electrodes.	2 % FS	3/4″NPT (6 points)

Electrical conductivity - Technical specifications.

- Stability: ±2×10-3FS/24h
- Mating electrode: 1.0cm-1 ABS plastic platinum black electrode as standard; other specifications are available.
- Electrode thread: 1/2″NPT
- Cable length: 5 m standard for plug-in type; 1.5 m standard for quick release type.
- Medium temperature： 0～50℃
- Electrode withstand pressure: 0.5Mpa
- Temperature compensating component: NTC10k
- Temperature compensation: 25℃ as the reference, automatic compensation

Resistivity - Technical specifications.

- Measurement range: 0 to 18.25MΩ;
- Accuracy: 2.0 % (FS)
- Stability: ±2×10-3FS/24h
- Mating electrodes: standard 0.05cm-1 316L stainless steel electrodes available as plug-in or quick release.
- Electrode thread: 1/2″NPT
- Cable length: 5 m standard for plug-in type; 1.5 m standard for quick release type.



Shanghai ChiMay Techology LTD
www.chimaytech.com / www.shchimay.com
chimay@chimaytech.com
WhatsApp/Cellphone:+86 131 1777 5471

- Medium temperature： 0～50℃
- Electrode withstand pressure: 0.5Mpa
- Temperature compensating component: NTC10k
- Temperature compensation: 25℃ as the reference, automatic compensation
- Temperature compensation: 25℃ as the base, manual or automatic compensation is optional.
- Calibration method: three-point calibration, PH4.00, PH6.86, PH9.18
- Power supply: DC12V-28V, 24V machine current <0.1A.
- Environmental conditions: (1)Temperature 0～50℃ (2)Humidity≤85%RH
- Dimension: 122×72×45mm (L×W×H).
- Mounting method: rail mounting.

VI. the transmitter network data acquisition schematic

Serial number	Marking	Description	Serial number	Marking	Description
1	24V+	Positive power input (+- reverse protection)	1	CH1 (Y/Yellow)	Channel 1 Conductivity measurement terminal
2	24V-	Negative power input (+- reverse protection)	2	CH1 (W/white)	Channel 1 Conductivity measurement terminal
3	NC	Empty	3	CH1 (R/red)	Temperature measurement terminal (NTC10K)
4	NC	Empty	4	CH1 (B/Black)	Temperature measurement terminal (NTC10K, ground terminal)
5	**GND**	**TTL level Ground terminal**	5	**CH2 (Y/Yellow)**	**Channel 2 conductivity measurement terminal**
6	**TTL RX**	**TTL level Local receiver**	6	**CH2 (W/white)**	**Channel 2 conductivity measurement terminal**
7	**TTL TX**	**TTL level Local transmitter**	7	**CH2 (B/Black)**	**Channel 2 conductivity ground terminal**
8	GND	RS485 ground terminal	8	CH3(Y/Yellow)	Channel 3 Conductivity measurement terminal
9	RS485 A+	RS-485 **A+** signal terminal	9	CH3 (W/white)	Channel 3 Conductivity measurement terminal
10	RS485 B-	RS-485 **B-** Signal side	10	CH3 (B/Black)	Channel 3 conductivity ground terminal

VII. Wiring instructions

VIII. Operating instructions

1. :Key Description:Right shift key :Digital increment key (Main parameter display switching key) : Confirmation key

2. Main parameter display interface, press the key to switch to dis / conductivity value (or PH value or ORP value), temperature value, 4-20mA display value; press the key to display the

Shanghai ChiMay Techology LTD
www.chimaytech.com / www.shchimay.com
chimay@chimaytech.com
WhatsApp/Cellphone:+86 131 1777 5471

user password input interface ----, press the key again to display 00000, default password 1000, enter the user parameter setting menu ↵ r correct input..

3. User setup menu description (EC conductivity).

CELL1: Channel 1 conductivity electrode type selection; selectable: 0.01/ 0.05/ 0.1/ 1.0/ 10.0 (cm-1).

CELL2: Channel 2 conductivity electrode type selection; selectable: 0.01/ 0.05/ 0.1/ 1.0/ 10.0 (cm-1).

CELL3: choice of channel 3 conductivity electrode type; selectable: 0.01/ 0.05/ 0.1/ 1.0/ 10.0 (cm-1).

Con1: channel 1 electrode constant correction, default: 1.000;

Con2: Channel 2 electrode constant correction, default: 1.000

Con3: Channel 3 electrode constant correction, default: 1.000

EC1: Channel 1 conductivity display value, manual correction, setting range: -9999 to 9999, default value: 0.000

EC2: Channel 2 conductivity display value, manual correction, setting range: -9999 to 9999, default value: 0.000

EC3: Channel 3 conductivity display value, manual correction, setting range: -9999 to 9999, default value: 0.000

EC-T: Conductivity temperature compensation coefficient , default value: 0.020

485: RS485 communication setting, Addr :communication address setting, default value: 01; bps: baud rate setting, default value: 9600.

CODE:User login password setting： Factory value 01000

4. LED indicator Description.

Alarm: Numerical overrun indicator.

Comm: RS485/TTL communication, local sending data indicator.

IX. Description of communication protocol

1. MODBUS RTU protocol format description, the default communication format: 9600-N-8-1, Addr: 1.
2. Instrument baud rate support: 2400,4800,9600,19200; communication interval >= 1 sec/time
3. Instrument address setting range: 1~200.
4. 03 Read command

For example, if you read the contents of input register 40001, "4" represents the holding register, but will not be used as the register address.

①In the general software for sending data through the serial port, "0001" is the register address, so the address in the data frame should be "0000".

②In the configuration software, "0001" is the register address, because it will automatically

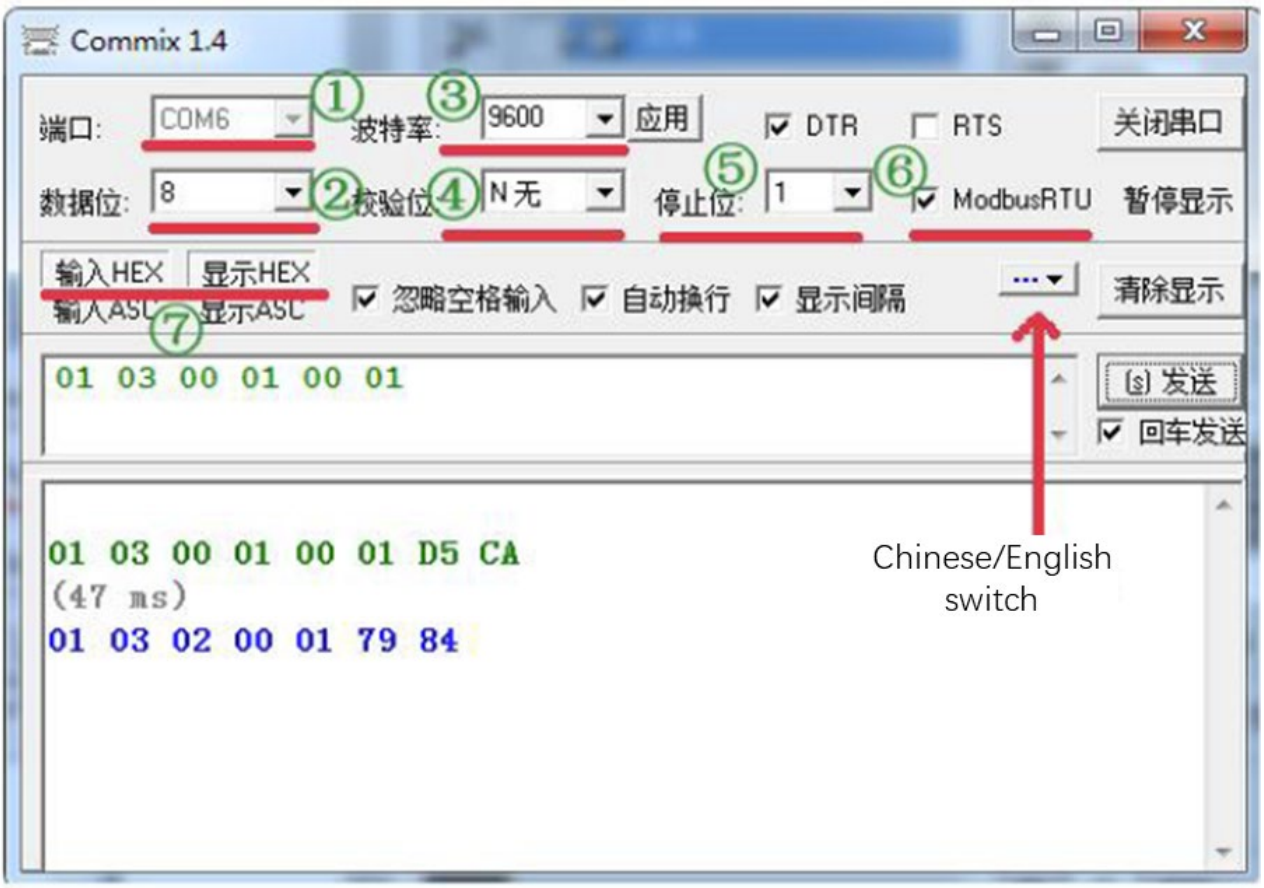
Shanghai ChiMay Techology LTD
www.chimaytech.com / www.shchimay.com
chimay@chimaytech.com
WhatsApp/Cellphone:+86 131 1777 5471

subtract 1 when sending data, directly fill in "0001" can be.

Special Note: Due to the different starting addresses of serial software and configuration software in the market, it causes communication errors and needs users' attention.

The following addresses correspond to the addresses in the MCGS configuration software or Configuration King software.

If you use the serial debugging assistant, such as the Commix serial assistant test or when the user writes his own program, the address number in the following table needs to be subtracted by one; if you are not sure whether the address number corresponds, you can pre-read the local address 02 or baud rate 03 for testing.



Commix 1.4 Parameter Settings

Modbus RTU Checksum Settings

5. RS-485 communication address description

Note: When using RS485 Modbus RTU communication, our company provides relevant test software. It can be obtained from our company; (supporting MCGS touch screen is available)

Communication interface: RS-485 (Mobus RTU);

Communication format: 96,N,8,1 (Baud rate 9600, no parity, 8 data bits, one stop bit);

Communication address description (the following address is used for serial assistant, if for configuration and PLC, address +1).

Data format: 16-bit unsigned integer.

0: local address.

1: Local baud rate.

2: CH1 conductivity; (integer)

3: CH2 conductivity; (divided by 10, default 1 decimal place)

4: CH3 conductivity; (divided by 100, default 2 decimal places)

5: Temperature value; (divided by 10, default 1 decimal place)

Address expansion (when equipped with 10.0 or 0.01 electrode, the following address data is used),

Note: Conductivity value = ((Conductivity high 16 bits * 65536) + Conductivity low 16 bits)/100;

6. CH1 conductivity high 16 bits.

Shanghai ChiMay Techology LTD
www.chimaytech.com / www.shchimay.com
chimay@chimaytech.com
WhatsApp/Cellphone:+86 131 1777 5471

7. CH1 conductivity low 16 bits.
8. CH2 conductivity high 16 bits.
9. CH2 conductivity low 16 bits.
10. CH3 conductivity high 16 bits.
11. CH3 conductivity low 16 bits.
12.CH1 resistivity value (divide by 100, keep 2 decimal places, use when matching 0.01 electrode);
13.CH2 resistivity value (divide by 100, keep 2 decimal places, use when matching 0.01 electrode);
14.CH3 resistivity value (divide by 100, keep 2 decimal places, use when matching 0.01 electrode);

Note: When K=0.01 electrode is selected, the default display of the transmitter is MΩ.cm, the RS485 transmission is uS/cm, and the two are reciprocal; 1/MΩ=uS, and vice versa: 1/uS=MΩ.

Shanghai ChiMay Techology LTD
www.chimaytech.com / www.shchimay.com
chimay@chimaytech.com
WhatsApp/Cellphone:+86 131 1777 5471

For other question, feel free to contact us.

Thank you for choosing ChiMay!

VCard

WhatsApp