



Digital Online Ion Sensor

Model: BH-485-ION User Manual

1. Introduction

BH-485-ION is a digital ion sensor with RS485 communication and standard Modbus protocol. Housing material is corrosion-resistant (PPS+POM), IP68 protection, suitable for most water quality monitoring environments; This online ion sensor uses an industrial-grade composite electrode, the reference electrode double salt bridge design and have longer working life; Built-in temperature sensor and compensation algorithm, high precision; It has been widely used in domestic and foreign scientific research institutions, chemical production, agricultural fertilizer, and organic wastewater industries. It is used for the detection of general sewage, waste water and surface water. It can be installed in sink or flow tank.



2. Technical Specification

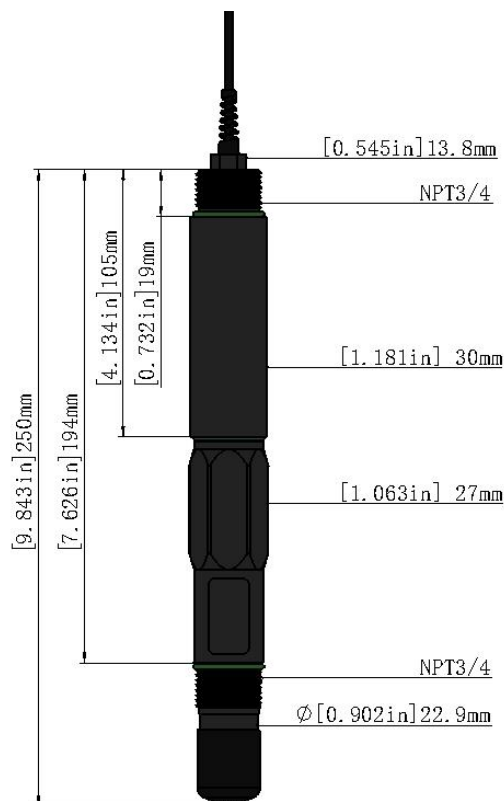
Model	BH-485-ION Digital Ion Sensor
Ions type	F ⁻ , Cl ⁻ , Ca ²⁺ , NO ₃ ⁻ , NH ₄ ⁺ , K ⁺
Range	0.02-1000ppm(mg/L)
Resolution	0.01mg/L
Power	12V (customized for 5V, 24VDC)
Slope	52~59mV/25℃
Accuracy	<±2% 25℃
Response time	<60s (90% right value)
Communication	Standard RS485 Modbus
Temperature compensation	PT1000

Dimension	D:30mm L:250mm, cable:3meters(it can be extended)
Working environment	0~45℃ , 0~2bar

3.Reference Ion

Ion Type	Formula	Interfering ion
Fluoride ion	F ⁻	OH ⁻
Chloride ion	Cl ⁻	CN ⁻ , Br ⁻ , I ⁻ , OH ⁻ , S ²⁻
Calcium ion	Ca ²⁺	Pb ²⁺ , Hg ²⁺ , Si ²⁺ , Fe ²⁺ , Cu ²⁺ , Ni ²⁺ , NH ₃ , Na ⁺ , Li ⁺ , Tris ⁺ , K ⁺ , Ba ⁺ , Zn ²⁺ , Mg ²⁺
Nitrate	NO ₃ ⁻	ClO ₄ ⁻ , I ⁻ , ClO ₃ ⁻ , F ⁻
Ammonium ion	NH ₄ ⁺	K ⁺ , Na ⁺
Potassium	K ⁺	Cs ⁺ , NH ₄ ⁺ , Tl ⁺ , H ⁺ , Ag ⁺ , Tris ⁺ , Li ⁺ , Na ⁺

4.Sensor Dimension



5. Calibration Steps

1. Connect the digital ion electrode to the transmitter or PC;
2. Open the instrument calibration menu or test software menu;
3. Rinse the ammonium electrode with pure water, absorb the water with a paper towel, and put the electrode into a 10ppm standard solution, turn on the magnetic stirrer and stir evenly at a constant speed, and wait for about 8 minutes for the data to stabilize (so-called stability: potential fluctuation $\leq 0.5\text{mV/min}$), record the value (E1)
4. Rinse the electrode with pure water, absorb the water with a paper towel, and put the electrode into the 100ppm standard solution, turn on the magnetic stirrer and stir evenly at a constant speed, and wait for about 8 minutes for the data to stabilize (so-called stability: potential fluctuation $\leq 0.5\text{mV/min}$), record the value (E2)
5. The difference between the two values (E2-E1) is the slope of the electrode, which is about 52~59mV (25°C).

6. Trouble Shooting

If the slope of ammonium ion electrode is not within the range described above, perform the following operations:

1. Prepare a newly prepared standard solution.
2. Clean the electrode
3. Repeat the "electrode operation calibration" again.

If the electrode is still unqualified after performing the above operations, please contact After-service Department of BOQU Instrument.

7. RS485 Communication code

Item	Register address	Data type	Read/Write	Remark
Ion measured value	0000H	Float	R	Corresponding ion
Temperature measured value	0002H	Float	R	°C
Ion mv value	0008H	Float	R	mV
485 Address	0010H	UINT16	W/R	1-247,default:1

Baud rate	0011H	UINT16	W/R	0:9600 1:19200 2:38400 3:115200 default0:9600
Expected value of 1st calibration	0032H	Float	W/R	Corresponding ion
Expected value of 2nd calibration	0034H	Float	W/R	Corresponding ion
Expected value of 3rd calibration	0036H	Float	W/R	Corresponding ion

Note: Float storage uses 32 bit float little-endian word swap mode, that is, "little-endian word swap mode". After word swap, the low-order byte is stored at the start address. For example: the floating point number 3.14, corresponding to the hexadecimal representation 0x4048F5C2, the storage order of the little-endian word exchange mode is C2F54840 from the starting address.