

# Quick-Start Guide

## VWQS-EC-01 Verge Conductivity Sensor

The Verge 4 in 1 water conductivity sensor measures EC TDS Salinity. It has high stability, excellent repeatability, and high measurement accuracy. The measurement variables are available as separate registers over Modbus. Systems are affordable, have digital linearization correction, high precision, high stability, and high performance. Has long life and high reliability. It has high-quality low-noise cable. It is simple to calibrate and is part of the Verge Sonde system, allowing for periodic automatic sensor cleaning

Solutions widely used in online monitoring of Salinity in environmental protection, sewage treatment, aquaculture, food processing, drinking water, recycled water cross contamination, it is simple to calibrate and is part of the Verge Sonde system, allowing for periodic automatic sensor cleaning. Sensor could be utilized alone or part of Sonde

<b>Parameter</b>	<b>Conductivity, TDS, Salinity</b>
<b>Units</b>	<b>us/cm (for conductivity)</b>
<b>Range</b>	<b>0-10000 (for conductivity)</b>
<b>Resolution</b>	<b>0.1 (for conductivity)</b>
<b>Accuracy</b>	<b>+0.1us/cm (for conductivity)</b>
<b>Protocol</b>	<b>RS485 Modbus</b>
<b>Temperature Limits</b>	<b>+5 to 55 degC</b>
<b>Voltage supply</b>	<b>9-24 VDC</b>
<b>Housing Materials</b>	<b>Acetyl</b>
<b>Cable Materials</b>	<b>Rubber</b>
<b>Cable Length</b>	<b>5m</b>
<b>Modbus Address (Adjustable)</b>	<b>03(DEC)</b>
<b>Wire colours</b>	<b>Red: V+, Black: V-, Yellow Modbus A, Green: Modbus B</b>

## Modbus details

**Waketime – needs to be equal to setting of the sensor with the longest waketime.**

```
        "waketime": 5000
    },
    "serial": {
        "log_en": true,
        "parity": "8N1",
        "baud": "9600",
        "type": "RS485",
        "device_type": "MODBUS_RTU",
        "mb": {
            "r1": {
                "addr": 3,
                "byte_order": "DCBA",
                "data_type": "UINT16",
                "funct": "HOLDING_REG",
                "name": "EC",
                "offset": 0.000,
                "reg": 0,
                "scaling": 1.000,
                "units": "uscm"
            }
        }
    }
},
```



0X01	0X03	0X00	0X00	0X00	0X04	0X44	0X09
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If the transmitter receives correctly, return the following data, slave → host

Address	Function code	Data length	Register 0 data	Register 1 data	Register 2 data	Register 3 data	CRC16 low	CRC16 high
0X01	0X03	0X08	0X02 0XAE	0X01 0X64	0X01 0X57	0X00 0XDE	0X1B	0XA9
			EC	Temperature	TDS	Salinity		

### Data representation method:

#### A. EC

Convert the returned data to decimal data

#### B. Temperature

Convert the returned data to decimal data  $\div 10$ , the negative number uses the complement algorithm, use 0XFFFF

After subtracting the data, add 1 and convert it to decimal data, then  $\div 10$ , then invert. C.TDS

Convert the returned data to decimal data

#### C. Salinity

Convert the returned data to decimal data  $\div 100$

The above data indicates that EC: 686uS/cm, temperature: 35.6 °C, TDS:343mg/L, Salinity 2.22ppt

➤ Make the linear calibration of the electrode constant

#### (1) Check the present electrode constant

Address	Function code	Start register address high	Start register address low	Data length high	Data length low	CRC16 low	CRC16 high
0X01	0X03	0X00	0X53	0X00	0X01	0X74	0X1B

If the transmitter receives correctly, return the following data, slave → hostAddresses	Function code	Start register address high	Start register address low	Electrode constant high	Electrode constant low	CRC16 low	CRC16 high
	0X03	0X00	0X53	0X03	0XE8	0XB5	0X65

So the present electrode constant is  $03E8(\text{HEX})=100(\text{Decimal})/100=1.0$

## (2) Change the electrode constant

The default is 03 E8, that means the electrode constant is 1.00, if you want to change the present EC values into 0.998, so need change the electrode constant in 03 E6, the instruction as following:

Address	Function code	Start register address high	Start register address low	Electrode constant high	Electrode constant low	CRC16 low	CRC16 high
	0X06	0X00	0X53	0X03	0XE6	0XF8	0XA1

If success, will return: 01 06 00 53 03 E6 F8 A1.

If the electrode constant change into the 0.98 times, and the EC TDS salinity will also change into 0.98 times.

## Precautions for use

1. Please observe the operating procedures and precautions of this manual when using.
2. The Salinity cell should be installed in the pipeline with stable flow rate and not easy to generate bubbles. It can be installed by bypass.
3. Concentric tubular electrodes should be installed in the FLOW direction, such as flat, diagonal or vertical installation and deep into the flowing water body; other structurally shaped electrodes prevent sparse flow in the measuring chamber due to turbulence during lateral installation. Be careful of air bubbles
4. Please keep the electrode measurement part clean during installation. Do not touch the surface directly with hands or dirty objects.

Accurate values cannot be measured for a long time after stains and greases or gels.

5. The Salinity cell is a precision measuring component, cannot be decomposed, cannot change the shape and size of the electrode, nor can be used in strong Acid, alkali cleaning, soaking and mechanical scraping, these operations will lead to changes in the electrode constant, affecting the system's measurement volume accuracy.

6. The instrument is assembled with precision integrated circuits and electronic components. Do not install it in direct sunlight. In a dry environment or in a control box, avoid leakage or measurement errors caused by water droplets or moisture.

7. In order to ensure the safety of the installation operation, turn on the power after the installation is checked.