

# RS-SJ-N01R01-2 King word shell water immersion sensor user's manual

Document version: V2.2



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# 1. Product introduction

## 1.1 Product Overview

The water immersion sensor is widely used in communication base stations, hotels, restaurants, computer rooms, libraries, archives, warehouses, and equipment

Cabinets and other places that require water accumulation and alarm. The unique AC detection technology is used to effectively avoid the problem of water leakage sensitivity decreased due to oxidation of the immersion electrode for a long time. The device can choose 485 output, switch quantity dry contact output. The 485 output is standard ModBus-RTU, and the maximum communication distance is 2000 meters. It can be directly connected to the on-site PLC, industrial control instrument, configuration screen or configuration software. The maximum distance of the external leakage electrode can reach 30 meters, and the external leakage rope of up to 30 meters can also be connected. The equipment adopts a waterproof shell with a high degree of protection, and can be used for a long time in harsh environments such as dampness and high dust.

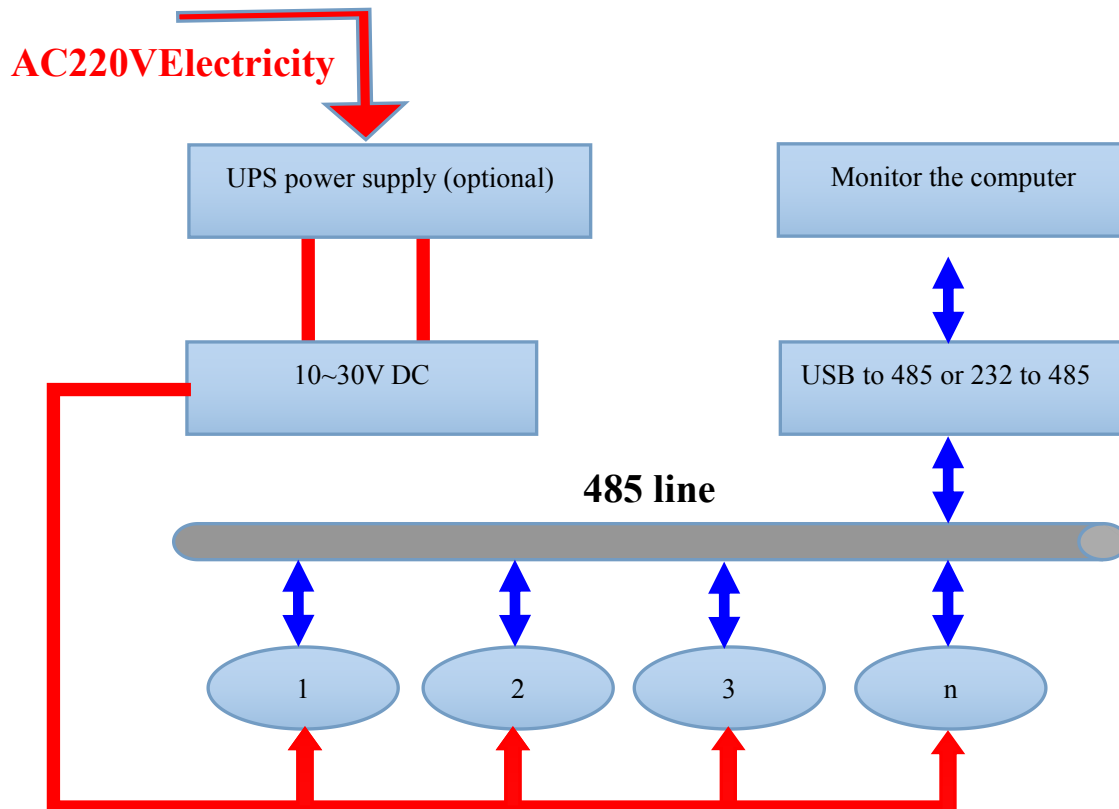
## 1.2 Features

I use the alternating current to collect the water inductor parameters, accurate distinction between whether the flooding, or even distinguish between pure water and tap water (default to tap water for the detection of pure water, if you want to test, please specify). Because the use of alternating current detection, even if the electrode immersion does not produce long-term electrophoresis polarization, do not rely on special electrodes, to achieve long life, reliable detection. --- This technology is our patent, has been authorized by the Patent Office, where counterfeit our company reserves the right to pursue its legal responsibility.

## 1.3 The main technical indicators

powered by	DC10-30V	
Maximum power consumption	Relay output	1.2W
	RS485 output	0.4W
Detection object	Tap water, purified water	
Transmitter circuit operating temperature	-20℃~+60℃, 0%RH~95%RH (non-condensing)	
output signal	Relay output	Normally open contact
	RS485 output	ModBus-RTU protocol

## 1.4 System frame diagram



Schematic diagram of the system

## 2. Product Selection

### 2.1 wangzi shell

RS-			Ren Shuo company code
	SJ-		Flooding sensor
		R01-	Relay normally open
		N01-	485 (Modbus-RTU protocol)
		N01R01-	485 + relay normally open point
			2
			King hanging shell shell

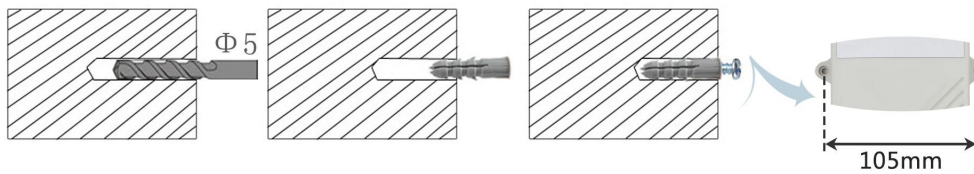
## 3. Equipment installation instructions

### 3.1 Inspection before equipment installation

Equipment List:

- 1 set of water sensor equipment
- Self-tapping screws (2 pcs), expansion plugs (2 pcs)
- Qualification certificate, warranty card, wiring manual, etc.
- USB to 485 (optional)

## 3.2 Installation step instructions



▲ 钻孔

▲ 膨胀塞放入孔内

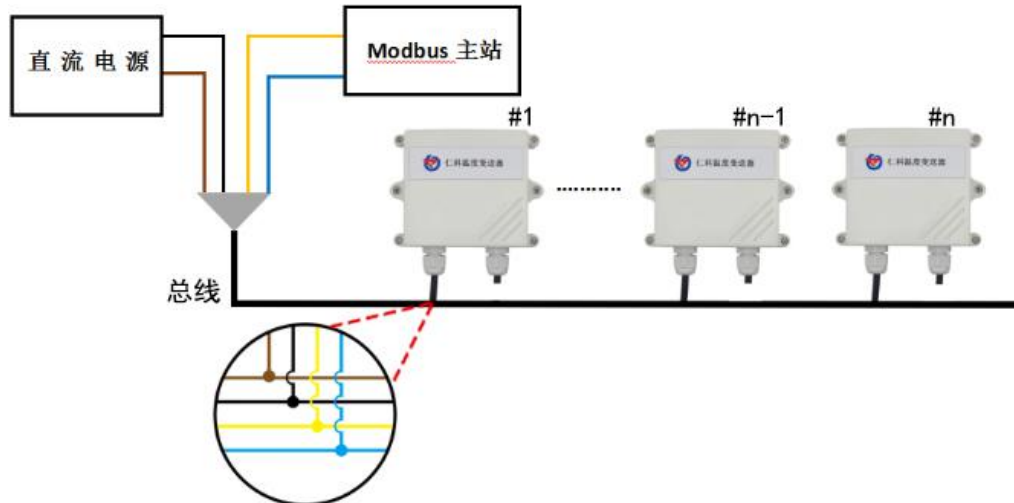
▲ 自攻螺丝旋进膨胀塞



## 3.3 wiring

### 3.3.1 Power supply and 485 signal wiring

Wide-voltage power input can be 10~30V. When wiring the 485 signal line, pay attention to the two lines A/B not to be reversed, and the addresses of multiple devices on the bus must not conflict.



### 3.3.2 Relay interface wiring

The standard equipment is equipped with 1 relay output, and the two outgoing wires are normally open contacts.

### 3.4 Specific model wiring

#### Wall-mounted king-shaped shell wiring

	485	Switch type
power supply	Power +(10 ~ 30V DC) (brown)	
	Power - (Black)	
Output	485-A(yellow)	Relay normally open contact (white, green)
	485-B(blue)	

### 3.5 Use of leaking rope

Customers who purchase our line-type water leakage sensor, please pay attention when connecting the leaking rope. The black line is the water leakage sensor line, and the yellow line is the support frame. The black sensor lines at both ends of the leaking rope should not touch each other.

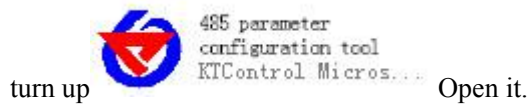


## 4. Configure the software installation and use



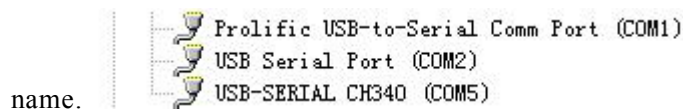
### 4.1 Software Selection

Open the package, select "Debugging Software" --- "485 parameter configuration software"



### 4.2 Parameter setting

① Select the correct COM port ("My Computer - Properties - Device Manager - Port" which view the COM port), the following chart lists several different 485 converter driver

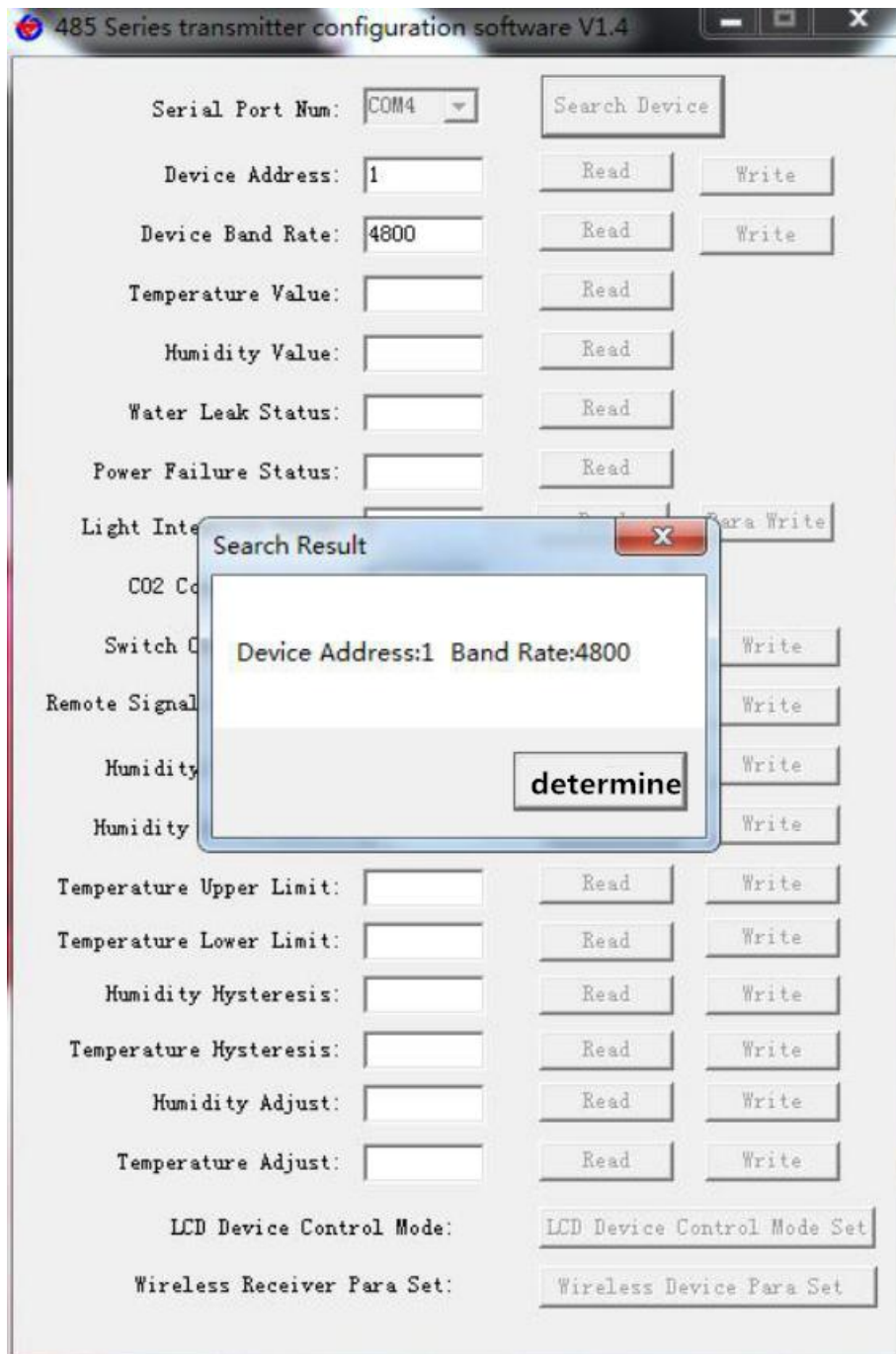


② Only a single device and a power, click on the software test baud rate, the software will test the current device baud rate and address, the default baud rate is 4800bit / s, the default address 0x01.

③ According to the need to modify the address and baud rate, while the device can query the current status of the function.

④ If the test is not successful, please re-check the device wiring and 485 driver installation.





## 5. Letter of agreement

### 5.1 Basic communication parameters

Coding	8-bit binary
Data bits	8 bits
Parity bit	no
Stop bit	1 person

Error checking	CRC (redundant cyclic code)
Baud rate	2400bit / s, 4800bit / s, 9600bit / s can be set, the factory default is 4800bit / s

## 5.2 Data frame format definition

Using Modbus-RTU communication protocol, the format is as follows:

Initial structure  $\geq$  4 bytes of time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16 bit CRC code

End structure  $\geq$  4 bytes of time

Address code: the address of the transmitter, in the communication network is the only (factory default 0x01).

Function code: The function instruction issued by the host indicates that the transmitter only uses the function code 0x03 (read register data).

Data area: the data area is the specific communication data, pay attention to 16bits data high byte first!

CRC code: two bytes of the check code.

The host polls the frame structure:

Address code	Function code	Register start address	Register length	Check digit low	Check digit high
1byte	1byte	2byte	2byte	1byte	1byte

The slave acknowledges the frame structure:

Address code	Function code	Effective number of bytes	Data area 1	Data area 2	Data area N	Check code low byte	Check code high byte
1byte	1byte	1byte	2byte	2byte	2byte	1 字节	1 字节

## 5.3 Register address

Register address	PLC or configuration address	content	operate	function code	Defaults	Definition description
0000 H	40001 (decimal)	Real-time flooding status	Read only	03	0	0 means normal, 1 means water
0002 H	40003 (decimal)	Real-time flooding status	Read only	03	1	1 means normal, 2 means there is water
0033 H	40052 (decimal)	Alarm delay	Read/write	03/06	0S	16-bit unsigned, the default is 0s
0034H	40053 (decimal)	Current sensitivity	Read/write	03/06	102	0~65535s can be set

## 5.4 Communication protocol example and explanation

5.4.1 Read the flooding status of device 0 register of device address 0x01

The query frame:

Address code	Function code	Start address	Data length	Check digit low	Check digit high
0x01	0x03	0x00 0x00	0x00 0x01	0x84	0x0A

Response frame: response to normal flooding

Address code	Function code	Returns the number of valid bytes	Data area	Check digit low	Check digit high
0x01	0x03	0x02	0x00 0x00	0xB8	0x44

Response frame: Response with water in the flooding state

Address code	Function code	Returns the number of valid bytes	Data area	Check digit low	Check digit high
0x01	0x03	0x02	0x00 0x01	0x79	0x84

5.4.2 Read the flooding status of device No. 2 register of device address 0x01

Interrogation frame:

Address code	Function code	Start address	Data length	Check digit low	Check digit high
0x01	0x03	0x00 0x02	0x00 0x01	0x25	0xCA

Response frame: response to normal flooding

Address code	Function code	Returns the number of valid bytes	Data area	Check digit low	Check digit high
0x01	0x03	0x02	0x00 0x01	0x79	0x84

Response frame: Response with water in the flooding state

Address code	Function code	Returns the number of valid bytes	Data area	Check digit low	Check digit high
0x01	0x03	0x02	0x00 0x02	0x39	0x85

### 5.4.3 Modify the alarm delay

Inquiry frame: modify the delay time to 10s

Address code	Function code	Start address	Data length	Check digit low	Check digit high
0x01	0x06	0x00 0x33	0x00 0x0A	0xF9	0xC2

Reply frame:

Address code	Function code	Start address	Data length	Check digit low	Check digit high
0x01	0x06	0x00 0x33	0x00 0x0A	0xF9	0xC2

If flooding is continuously monitored within 10s, the equipment will alarm.

### 5.4.4 Set the water sensitivity value (take 300 as an example)

Interrogation frame:

Address code	Function code	Start address	Data length	Check code low byte	Check code high byte
0x01	0x06	0x00 0x34	0x01 0x2C	0xC8	0x49

Response frame: the current sensitivity is 300

Address code	Function code	Start address	Data length	Check code low byte	Check code high byte
0x01	0x06	0x00 0x34	0x01 0x2C	0xC8	0x49

### Sensitivity setting description

The sensitivity value is inversely proportional to the actual sensitivity. The larger the setting value, the less sensitive the device detection, the smaller the sensitivity value, the more sensitive the device detection. But it should be noted that if the sensitivity value is too small, it is easy to cause false alarms. It is recommended to use the factory default value.

Default value: 102

Range: 0-1024

## 6. Frequently Asked Questions and Solutions

### 6.1 Device can not connect to the PLC or computer

possible reason:

- 1) the computer has more than one COM port, choose the port is not correct.
- 2) The device address is incorrect, or there is a device with a duplicate address (factory default is 1).
- 3) baud rate, parity mode, data bits, stop bit error.
- 4) Host polling interval and waiting for response time is too short, need to be set in more than 200ms.
- 5) 485 bus is disconnected, or A, B line reverse.
- 6) too many devices or wiring is too long, the nearest power supply, plus 485 enhancers, while increasing the 120Ω termination resistor.
- 7) USB to 485 drive is not installed or damaged.
- 8) Equipment damage.

## 7. Contact Information

Shandong Renke Control Technology Co., Ltd.

Address: 2 / F, East Block, Building 8, Shun Tai Plaza, High-tech Zone, Jinan City, Shandong Province

Post code: 250101

Phone: 400-085-5807

Website: [www.renkeer.com](http://www.renkeer.com)

Cloud platform address: [en.0531yun.cn](http://en.0531yun.cn) Or: [eniot.0531yun.cn](http://eniot.0531yun.cn)

Web QR:



## 8. Document Histor

- V1.0 Document is established.
- V1.1 Increase the card rail shell flooding.
- V1.2 Increase wiring rules and solutions to common problems.
- V1.3 adds installation step instructions
- V2.0 documentation update
- V2.1 Add 0 register to indicate real-time flooding status
- V2.2 Added the description of alarm delay function setting

## 9. Appendix: Shell size

Wall-mounted king-shaped shell size: 110×85×44mm

