User Guide

Product Introduction

The probe adopts PH electrode, with stable signal and high precision. It has the features of wide measuring range, good linearity, good waterproof performance, easy to use, easy to install, and long transmission distance. Adopting MODBUS-RTU protocol, the upper computer can monitor the value through the communication mode of RS485 interface. Used with equipment to achieve the function of remote measurement and online monitoring on the computer platform or mobile phone APP.

Use Case Scenarios

It is widely used in homes, offices, flowers, farms and other places where soil pH needs to be measured.

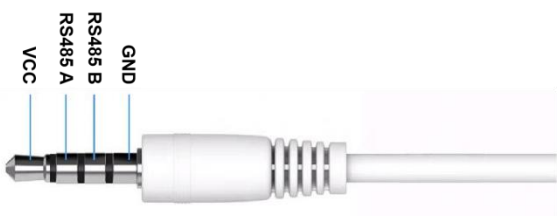
Features

1. High precision and fast response.
2. Stronger stability and anti-interference ability.
3. Wide voltage input, DC 5~30V.
4. Standard MODBUS RTU protocol.

Product Specifications

Specifications	
Model	UB-SPH-N1
Power Supply	DC 5~30V
Max Current	132mA（@5V）
Measuring Range	3~9 PH
Resolution	0.1
Protection level	IP68
Connector	Audio
Cable Length	3m
Probe Material	Anti-corrosion special electrode
Sealing Material	Black flame retardant epoxy resin
Communication Protocol	RS485 Modbus RTU Protocol
RS485 Address	0xE1
Baud Rate	1200 bit/s,2400 bit/s, 4800 bit/s (default), 9600 bit/s, 19200 bit/s

Wiring Instruction



Measurement Area

Measurement area: Inside a 5cm diameter cylinder of equal height to the probes, centred on the centre of the two probes.

Quick Test Method

Select a suitable measurement site, avoid rocks and ensure that the steel needle does not touch hard objects. Throw away the top layer of soil according to the required measuring depth, keep the original tightness of the soil underneath, and insert the sensor vertically into the soil by holding it tightly. Do not shake the sensor from side to side when inserting it. It is recommended to take several measurements within a small area of one measurement point to find the average value.

Ground Penetration Method

Vertically dig a pit with a diameter of >20cm. Insert the sensor pin horizontally into the pit wall at the established depth and fill the pit tightly. After a period of stabilisation, measurements and recordings can be made over a period of days, months or even longer.

Communication protocols

1. Communication basic parameters

Communication Basic Parameter	
Coding System	8–bit binary
Data Bit	8 bits

Parity Checking Bit	none
Stop Bit	1 bit
Error Checking	CRC Check
Baud Rate	1200 bit/s, 2400 bit/s, 4800 bit/s (default), 9600 bit/s, 19200 bit/s

2. Data Frame Format

The Modbus-RTU communication protocol is used in the following format:

- Initial structure ≥ 4 bytes in time.
- Address code: 1 byte, default 0xE1.
- Function code: 1 byte, support function code 0x03 (read only) and 0x06 (read/write).
- Data area: N bytes, 16-bit data, high byte comes first.
- Error check: 16-bit CRC code.

Request					
Slave Address	Function Code	Register Address	No. of Registers	CRC LSB	CRC MSB
1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte

Response							
Slave Address	Function Code	No. of Bytes	Content 1	Content 1	...	Content n	CRC
1 byte	1 byte	1 byte	2 bytes	2 bytes	...	2 bytes	2 bytes

- End structure ≥ 4 bytes of time.

3. Register Address

Register Address				
Address	Content	Register Length	Function Code	Description of definitions
0x0000	PH	1	03	Unsigned integer data, divided by 10
0x07D0	Address	1	03/06	1 ~ 255
0x07D1	Baud Rate	1	03/06	0:2400, 1:4800, 2:9600

NOTE

1. The probe must be fully inserted into the soil when measuring.
2. Pay attention to the lightning protection when using in the field.
3. Do not violently bend the probe, do not pull the sensor lead wire, do not drop or hit the sensor violently.
4. Due to the presence of radio frequency electromagnetic radiation in the air, should not be in the air for a long time in the state of power.