

**JXCT**<sup>®</sup>



# JXBS-3001-PH

## Soil PH Sensor User Manual

**Analog Output (4-20mA/0-5V/0-10V)**

Version: 2.0

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Status: Released

[www.jxct-iot.com](http://www.jxct-iot.com)

# I. Product Introduction

## 1.1 General Info

The transmitter is widely used in applications where pH value monitoring is required, such as soil pH measurement. The input power supply, sensor probe, and signal output of the sensor are completely isolated. Safe and reliable, beautiful appearance and convenient installation.

## 1.2 Features

The probe of this product adopts PH electrode, with stable signal and high precision. It has the characteristics of wide measurement range, good linearity, good waterproof performance, easy to use, easy to install, and long transmission distance.

## 1.3 Main Specs

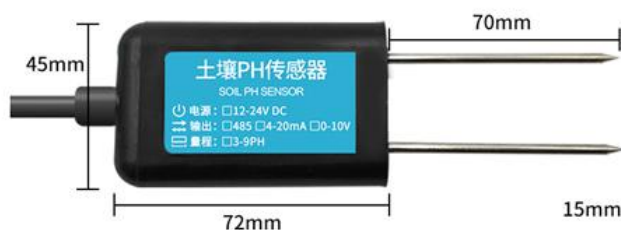
Specs	Content
Power Supply Default	12-24V DC
Consumption	≤0.15W
Detect Accuracy	±0.3pH
PH Detect Range	3-9pH
Long-term Stability	≤5%/year
Transmit Output	4-20mA/0-5V/0-10V
Working Temperature	0-55℃
Response Time	≤15s

# II. Hardware Connection

## 2.1 Check before installation

Product List:

Name	Qty
Sensor	1Pc
12V Water-proof battery	1Pc(Optional)
USB to 485 Converter	1Pc(Optional)
Warranty	1Pc



## 2.2 Port Description

Wide voltage power input can be 12-24V. When connecting the 485 signal line, please note that the two lines of A / B cannot be reversed, and the addresses of multiple devices on the bus must not conflict.

Function	Cable Color	Specs
<b>Power</b>	Brown	Power supply +
	Black	Power supply -
<b>Communication</b>	Yellow (grey)	Voltage/Current Output Positive
	Blue	Voltage/Current Output Negative

Note: Please be careful not to connect the wrong wire sequence, the wrong wiring will cause the device to burn.

The factory default provides 0.6 meters long wire, the customer can extend the wire or connect according to the need.

Note that there may be no yellow line in the line sequence that may be provided in some factory batches. In this case, the gray line is equivalent to replace the yellow line.

## 2.3 Installation

Please note the following precautions:

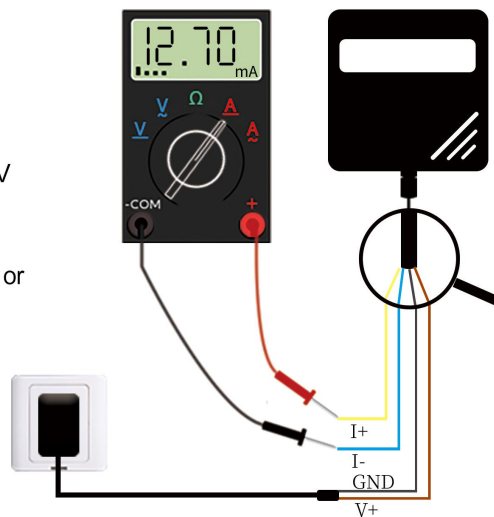
1. Avoid installation in areas that are easy to transfer heat and directly cause a temperature difference with the area to be measured, otherwise it will cause inaccurate PH measurement.
2. Install in a stable environment, avoid direct sunlight, stay away from windows and air-conditioning, heating and other equipment, and avoid direct windows and doors.

# III. WIRING INSTRUCTIONS

## 3.1 Typical four-wire wiring

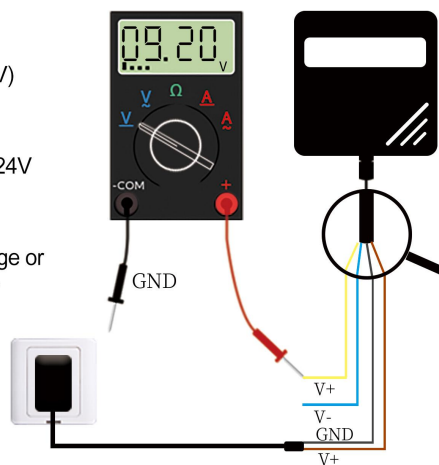
As shown in the following figure, the current sensor connection mode connects the power line (brown line and black line) of the sensor to the power supply; the yellow (gray) color line of the sensor is the signal that is connected to the acquisition device and the current flows to the sensor. To the collection device; the blue line of the sensor is the signal is being connected to the signal of the current acquisition device, the current flow is from the acquisition device to the sensor;

Current output type(4-20mA)  
 Four-wire connection  
 first step  
 Connect the sensor with 12V~24V  
 power adapter  
 Second step  
 Correctly select multimeter range or  
 connect analog signal collector  
 third step  
 Calculate the formula



The following figure shows the voltage sensor connection mode. The power line (brown line and black line) of the sensor is connected to the power supply; the yellow (gray) color line of the sensor is the signal that is connected to the acquisition device. Positive, yellow (gray) The voltage of the line is the output voltage; the blue line of the sensor is the signal that the signal is being connected to the voltage acquisition device, and the voltage of the blue line is the reference voltage, which is consistent with the voltage of the black line being 0V.

Voltage output type(0-5V/0-10V)  
 Three-wire connection  
 first step  
 Connect the sensor with 12V~24V  
 power adapter  
 Second step  
 Correctly select multimeter range or  
 connect analog signal collector  
 third step  
 Calculate the formula



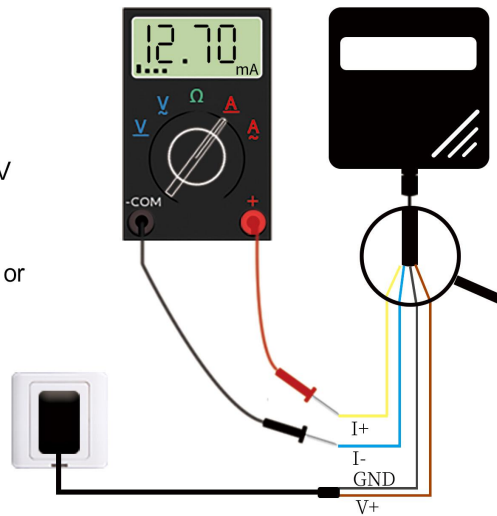
### 3.2 Typical Three-wire Connection Mode

For a typical three-wire connection, the blue line can be omitted compared to the four-wire connection mode. In the sensor, the blue line and the black line are short-circuited in the sensor, so the blue line can be omitted.

For the three-wire current connection mode, connect the power line (brown line and black line) of the sensor to the power supply, and just connect the yellow (gray) color line of the sensor to the signal of the current acquisition

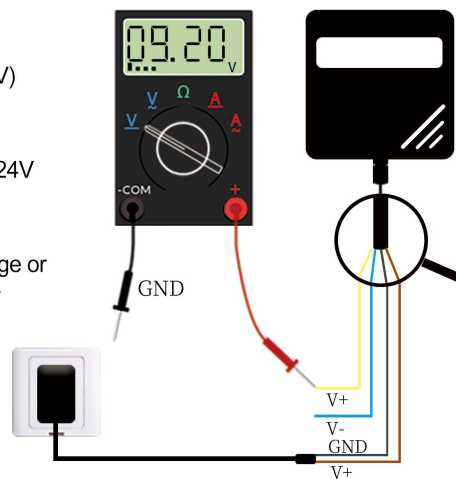
device.

- Current output type(4-20mA)
- Four-wire connection
- first step
- Connect the sensor with 12V~24V power adapter
- Second step
- Correctly select multimeter range or connect analog signal collector
- third step
- Calculate the formula



For the three-wire voltage connection method, after the power cables (brown wires and black wires) of the sensors are connected to the power supply, it is only necessary that the yellow (gray) color line of the sensor is connected to the signal of the voltage acquisition device.

- Voltage output type(0-5V/0-10V)
- Three-wire connection
- first step
- Connect the sensor with 12V~24V power adapter
- Second step
- Correctly select multimeter range or connect analog signal collector
- third step
- Calculate the formula



## IV. Analog Conversion

### 4.1 Analog 4-20mA Current Output

Current Value	variable
4mA	3
20mA	9

The calculation formula is  $P = (3 \cdot I + 12) / 8$

Unit for I is mA. With 4mA representing 0 point and 20mA representing the maximum range, users can obtain the soil pH value through linear conversion.

## 4.2 Analog 0-10V Voltage Output

Voltage Value	variable
0V	3
10V	9

The calculation formula is  $P=(6*V+30000)/10000$

Unit for V is mV. With 0V representing 0 point and 10V representing the maximum range, users can obtain the soil pH value through linear conversion.

## 4.3 Analog 0-5V Voltage Output

Voltage Value	variable
0V	0
5V	9

The calculation formula is  $P=(6*V+15000)/5000$

Unit for V is mV. With 0V representing 0 point and 5V representing the maximum range, users can obtain the soil pH value through linear conversion.