INSTRUCTION MANUAL

INTELLIA SOIL PH SENSOR

TYPE RS485

INT-PH1

I BRIEF INTRODUCTION

1.1 Product Overview

The transmitter is widely used in soil PH detection, sewage treatment and other occasions requiring PH monitoring. The three parts of input power, induction probe and signal output are completely isolated. It's safe and reliable and with beautiful appearance, easy to be installed.

1.2 Function Characteristics

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

1.3 Technical Parameters

Parameter	Content
Power supply(defult)	12-24V DC
Power consumption	≤0.15W（@12V DC , 25℃）
Measuring accuracy	±0.5pH
Measuring range	0-14pH
Long-term stability	≤5%/y
Output signal	RS485 (Mondbus protocol)
Operating temperature	0-65℃
Response time	≤15s

1.4 System frame Diagram

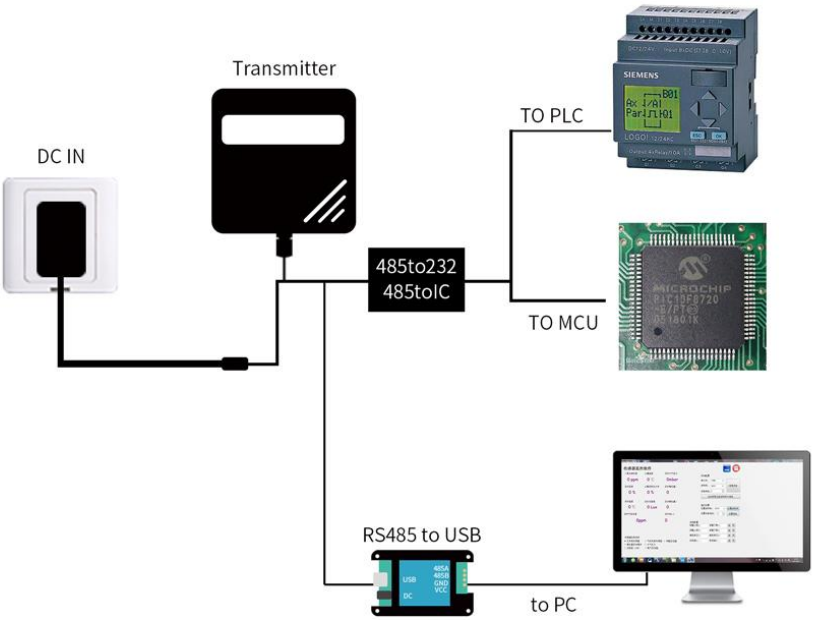


FIGURE 1 SINGLE-ENDED

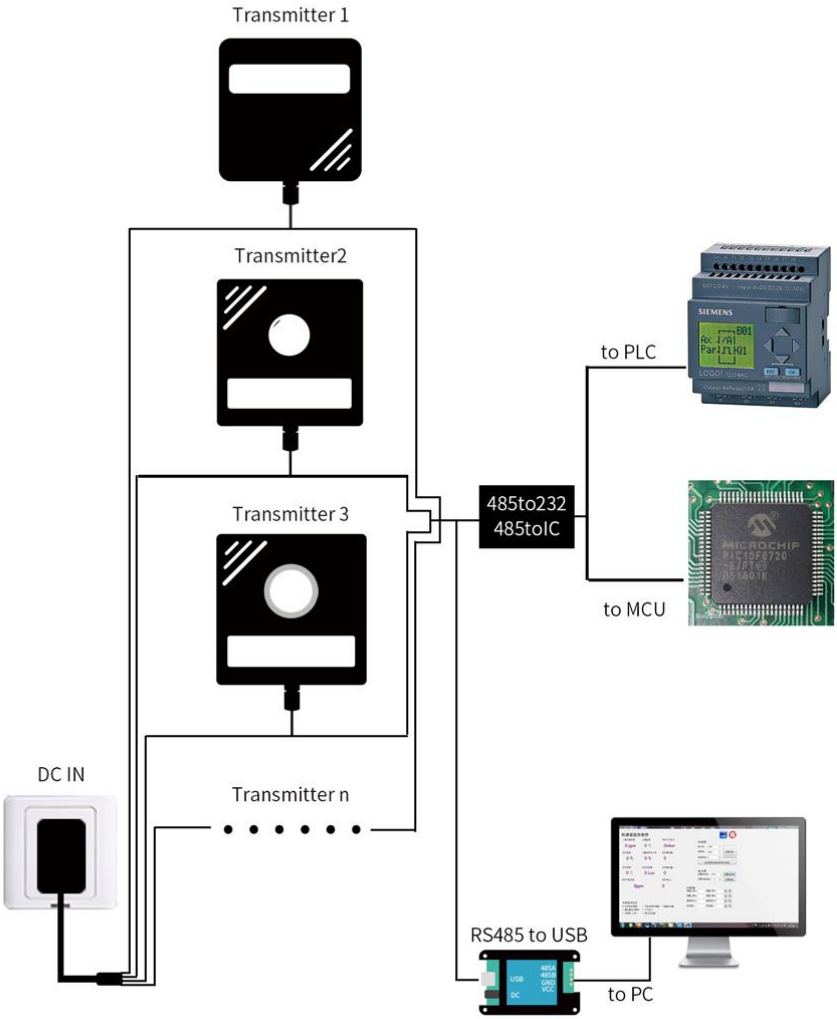


FIGURE 2 MUTIPLE-ENDED

II HARDWARE CONNECTIONS

2.1 CHECKING BEFORE INSTALLATION

Check the list of devices before installation:

TABLE 1 List of Devices

Name	Number
THE SENSOR DEVICE	1
12V POWER ADAPTER (Optional)	1
THE USB TO 485 DEVICE(Optional)	1

2.2 Interface Description

Before you wiring and use, please read this article in detail, Improper use may result in irreversible damage to the product.

TABLE 2 Wiring Description

	Line Color	Description
Power	Brown	Power supply Positive (12-24V DC)
	Black	Power supply Negative
Communication	Yellow (Gray)	485-A
	Blue	485-B

We provide default cable length of 1.5 meters, you can extend the cable yourself according to your needs.

2.3 Installation Instructions

Please note the following precautions:

1) Avoid installation in an area which is easy to transfer heat and will directly cause temperature difference with the area to be tested. Otherwise, the PH measurement will be inaccurate.

2) Installed in an environmentally stable area to avoid direct sunlight, Stay away from windows, air conditioners, heaters and other equipment. Avoid direct exposure to windows and doors.

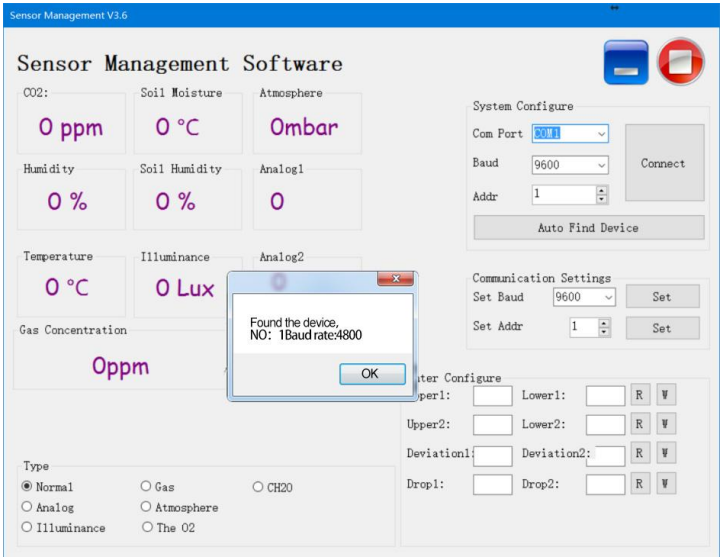
III CONFIGURATION TOOL INSTALLATION AND USE

We provide **CONFIGURATION TOOL** , which can be easily used to test our sensor device.

3.1 Sensor Access Computer

Transmitter can be connected to PC with the RS485 to USB adapter. You can check the COM port number through Device Manager (right click My Computer).

3.2 How To Use Configuration Tool



Please note that this software can only test one device at the same time. After connecting the physical device, click the **CONNECT** button to read the information. In the UNCONNET state, you can modify BAUD and ADDR in COMMUNICATION SETTINGS.

Under the software, different check boxes can be selected according to different situations. For example, you can choose the GAS option to test the RS485 OXYGEN SENSOR , you can choose the NORMAL option to test the RS485 TEMPERATURE AND HUMIDITY SENSOR .

IV COMMUNICATION PROTOCOL

4.1 Communication Basic Parameters

TABLE 3 Communication Basic Parameters

Protocol	Modbus RTU
Data bits	8 bit
Parity bit	No
Stop bit	1 bit
Error checking	CRC (redundant loop code)
Baud rate	2400 bps/ 4800 bps/ 9600 bps can be set factory defaults to 9600 bps

For more information about Modbus RTU, please visit the website "www.modbus.org ".

4.2 Register Address

Register Address	PLC Configuration Address	Content	Operation
0002H	40003	High precision pH (unit 0.01PH)	Read-Only
0003H	40004	Low precision pH (unit 0.1PH)	Read-Only
0100H	40101	Device Address (0-252)	R/W
0101H	40102	Baud Rate (2400/4800/9600)	R/W

TABLE 4 Register Address

4.3 Communication example

4.3.1 Read Device Address 0x01's Soil PH

TABLE 5 Inquiry Frame

Address Code	Function Code	Start Address	Data Length	CRC_L	CRC_H
0x01	0x03	0x00 0x0d	0x00 0x01	0x15	0xC9

TABLE 6 Answer Frames(eg: read the PH value is 7.1pH)

`Address Code	Function Code	Number Of Valid Bytes	Data Value	CRC_L	CRC_H
0x01	0x03	0x02	0x02 0x47	0xD8	0x15

pH calculation instructions:

0047H(hexadecimal)=71=>pH=7.1pH