

CDT-17B  
Soil PH Sensor  
Manual

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## CDT-17B Soil PH Sensor

### ◆ **Product Brief**

CDT-17B pH sensor should be a good solution to measure pH value. It uses low-impedance sensitive glass, adopts internal signal isolation technology, has strong anti-interference ability, has good reproducibility, thermal stability, and does not require professional calibration instruments. Easy installation, stable performance, can be used to continuously measure the pH value of the soil, suitable for agriculture and environmental protection and other fields.

### ◆ **Application**

- Meteorological Monitoring
- Micro Environmental Monitoring
- Grid Environment Monitoring
- Agricultural Meteorological Monitoring
- Meteorological Traffic Monitoring
- Photovoltaic Environment Monitoring
- Meteorological Environment Monitoring for Smart Cities

### ◆ **Features**

- Small in size
- High integration
- Easy to install
- Free testing software MODBUS - poll V1.0 (ask your salesperson for it)
- Integrated design
- Low starting threshold
- One year warranty

# CDDA Technical Data

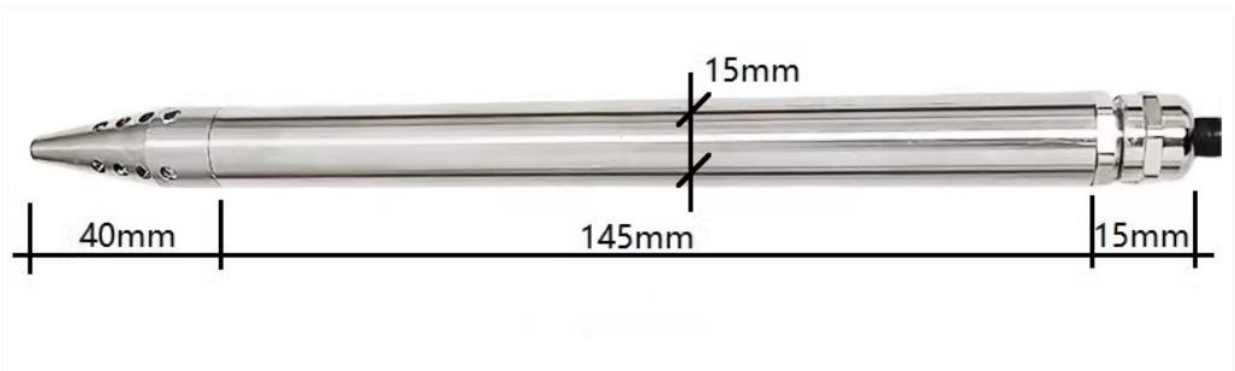
CDT-17B Soil PH Sensor

## ◆ Technical Parameters

Parameters	Measuring Range	Accuracy	Resolution
PH	0-14	±0.05PH	0.01PH
Temperature	0-60°C	±0.3°C	0.01°C
Measurement Principle	Electrochemistry		
Supply	7-30VDC (power consumption<0.2W)		
Response time	<10s (soil moisture>30%)		
Stability	≤0.01PH/24h		
Output Signal	4-20mA & RS485 at the same time		
Calibration Cycle	Every 6 month		
Operating Environment	0-+80°C(<0.6MPa)		
Cable length	5m(default), Customizable		
Probe material	304SS		
Ingress Protection	IP68		
Storage	10-60°C@20%-90%RH		
Temperature compensation	Default temperature @25°C		

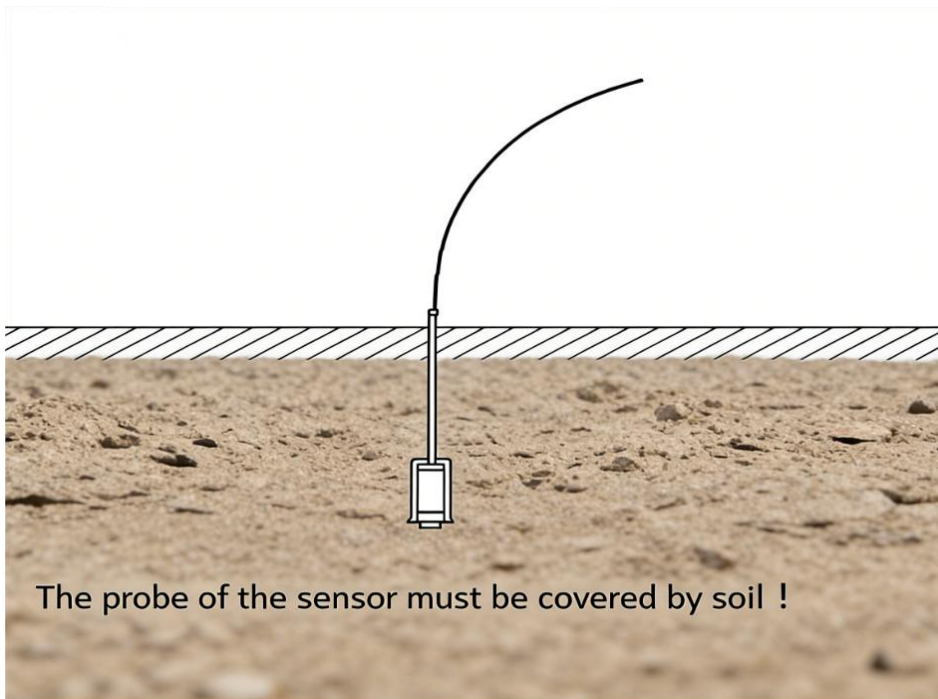
★ Specifications may be updated without prior notice.

◆ **Product Size**



◆ **Accessories:**

Mounting Manner:



## **MODBUS RTU Communication Protocol**

### **(Apply to CDT-17B product)**

Baud Rate: 9600  
Data Bits: 8  
Stop Bit: 1  
Check Bit: None

#### **1.1 CRC Description:**

Among all the following instructions, the two bytes of CRC16 in MODBUS RTU protocol are as follows: the low byte comes before and the high byte comes after.

In the following instructions, the assumed sensor address is 0x03 (the default sensor address is 03).

#### **1.2 Return Error Code Rule:**

When receive error instruction (including CRC16 validation error), no error codes will be returned. It is considered to be a failure, when there is no return data in 200ms after the instruction is issued. Upper computer may resend instruction.

#### **1.3 Standard MODBUS register description**

Special Notice:

The quantity or length of the register in MODBUS is two bytes with 16 bits as a unit (the high byte comes first, and the low bytes follows), instead of one byte with 8 bits as a unit.

User shall ensure that the address and quantity of register in command are confined within the range specified by the system. Otherwise, the output of the sensor will be unpredictable. Users shall ensure that the MODBUS command complies with the requirements of this manual in the software design of the upper computer and the minimum query period supported is 1s/ time.

**Input register: read with function code 03**

Address	Operation	Contents	Note
0x0000	Read-only	PH, double precision floating point number. For example, 0x40E0 0x51EC indicates 7.01	
0x0004	Read-only	Temperature, double precision floating point number. For example, 0x41C9 0x47AE indicates 25.16	
0x0014	Read/Write	Device Address(1-255)	Default address 03

**1.4 Electrical Connections**

Connector (cable)	Voltage/Current	RS485
Red	V+	V+
Black	V-	V-
Yellow	/	RS485A
Green	/	RS485B
Write	Signal	/

**1.5 Communication Example**

The following is an example of how to use MODBUS RTU commands to access system registers:

1. Read multiple input registers (real time data) command

Send: 03 03 00 00 00 06 C4 2A

03	03	00 00	00 06	C4 2A
System Address	Function Code	Register Address	Number of Registers	CRC16 check digit automatically generated by software

Answer: 03 03 0C 40 E0 51 EC C0 89 99 9A 41 C9 47 AE AE CE

03	03	0C	E0 51 EC C0 89 99 9A 41 C9 47 AE	AE CE
System Address	Function Code	The number of bytes in a data segment	Segment Data	CRC16 check bit

Analytical Data:

PH: 0x40E051EC >>7.01

Temperature: 0x41C947AE >>25.16°C

2. Modify internal register (system address) command (change the address to 0x01)

Send: 03 06 00 14 00 01 09 EC

03	06	00 14	00 01	09 EC
System Address	Function Code	Register Address	New Address	CRC16 check digit automatically generated by software

Answer: 03 06 00 14 00 01 09 EC (indicates that the modification is successful)

## Warranty and After-sales Service:

Warranty: The product warranty period is 12 months from the delivery date (except for the product problems caused by not operating in accordance with corresponding technical requirements or other artificial behavior).

After-sales telephone: 86-0731-86117089 [www.codasensor.com](http://www.codasensor.com) Molly@codasensor.com

## Other Weather Sensors

Model number	Type	Output	Special features
CDF-10A	Wind speed	Pulses(PNP) RS485 4-20MA 0-5V	Three cup plastic wind speed
CDF-11A	Wind direction	RS485 4-20MA 0-5V	Plastic wind direction sensor
CDW-33A	Atmospheric Temperature, Humidity & Pressure	RS485	Shelter installation
CDY-12A	Economical Tipping Bucket Rainfall	Pulses(@10kΩ&0.01uF),RS485	Diameter :φ200mm, height: 271mm
CDG-10B	Solar Radiation	0-5V,4-20mA,RS485	Spectral range:300~1100nm
CDT-11A	PH sensor	0-2V 0-5V 4-20mA RS485	Probe: Φ28*160mm
CDT-12A	DO sensor	RS485 4-20mA	Range 0-20mg/L(ppm)
CDT-12B	DO sensor(calibrable)	RS485 4-20mA	Range 0-20mg/L(ppm)
CDT-14A	ORP sensor	RS485 4-20mA	Range -1500mV-+1500mV
CDT-15A	Suspended Matter	RS485	Range 0-200mg/L,0-1000mg/L,0-5000mg/L
CDT-17B	Soil PH sensor	RS485 4-20mA	Probe material:304SS
CDT-19B	Turbidity (SS) sensor	RS485 4-20mA	Wavelength of falling radiation: 860nm
CDT-21B	Soil EC_salinity	RS485 4-20mA	Probe material:316L
CDT-22B	Soil Moisture & Temperature	4-20mA ,0-5V,0-2V,RS485 optional	Probe material:316L
CDT-30B	Soil Moisture, Temperature & EC	RS485,0-2V	316L stainless steel
CDT-70B	Soil 7 in 1 Sensor	RS485	Soil Moisture, Temperature & EC & PH & NPK
CDT-1T2B	Seismic Detection Wave	0-20mV RS485	Natural Frequency(Hz):10±2.5%
CDT-1T3B	Soil layers temperature&moisture	RS485	Range 0-100℃ 0-70%
CDT-1T4B	TDS Sensor	RS485 4-20mA	Range 0-2000ppm
CDT-1T5B	Dissolved CO2 Sensor	RS485	Range 0-2000ppm
CDT-1T6B	Residual Chlorine	RS485	Range 2mg/L,8mg/L,20mg/L
CDT-N0C	Multi-parameter water quality Sensor	RS485	Multi-parameter integration