USER GUIDE FOR CDT-30B SOIL MOISTURE TEMPERATURE EC SENSOR

CDT-30B-01-MN-10	SEP-2024

This document is applied for the following products

SKU	CDT	HW Ver.	1.0	FW Ver.	1.0
Item Code	CDT-30B	Soil Moisture&Temperature&EC Sensor, 4-20mA RS485 0-5V 0-2V Output, ABS&SUS304			

1. Introductions

CDT-30B Soil Moisture, Temperature & EC Sensor is integrated the moisture, temperature & EC measurement.The stainless steel probe is inserted into soil surface or soil profile to test quickly. The product with temperature compensation to ensure the accuracy of measurement. The probe can be permanently embedded underground and be connected to a data logger for unlimited testing.

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2. Specification

Item	Technical Specification		
	Moisture	Temperature	EC
Range	0-100%（m³/m³）	-30℃-+70℃	0-10mS/cm
Accuracy	±2%(0-50%) ±3%(51-100%)	±0.5℃	±3%FS
Output Signal	RS485,0-2V		
Response Time	<1s		
Supply	5VDC, 12-24VDC		
Effective measurement area	With the center of the probe diameter is 70mm, high 70mm cylinder		
Housing	ABS		
Dimensions	45*15*145mm(probe:3* Ø3*70mm)		
Operating Temperature	-40℃-+80℃		
Ingress Protection	IP68		
Storage	10-60℃@20%-90%RH		
Probe material	316L stainless steel		

3.Working Process

FDR soil moisture sensors use the reflection properties of electromagnetic waves in the soil to measure soil moisture. The sensor emits electromagnetic waves of a certain frequency, which travel through the soil and are reflected back.
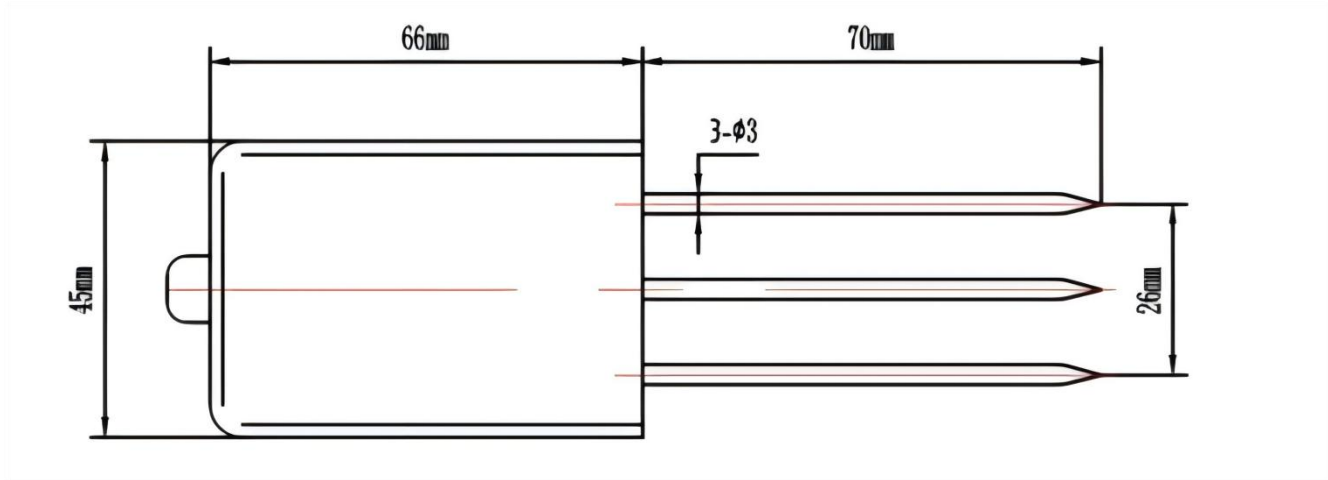
Soil moisture will affect the reflection coefficient of electromagnetic wave. By measuring the change of reflection coefficient, soil moisture can be determined.

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4. Electrical Connections

Connector（cable）	RS485	Voltage
Red	V+	V+
Black	V-	V-
Yellow	RS485A	EC
Green	RS485B	Humi.
Brown		Temp

5. Dimensions

6. Installation

Soil Surface measure method

1. Select a representative soil environment to clean up surface debris and vegetation

2. Insert the sensor vertically and completely into the soil

3. If there is a hard object, the measurement location should be replaced and re-measured

4. For accurate data, it is recommended to measure multiple times and take the average

Buried measure method

1. Make a soil profile in the vertical direction, slightly deeper than the installation depth of the bottom most sensor, between 20cm and 50cm in diameter.

2. Insert the sensor horizontally into the soil profile

3. After the installation is completed, the excavated soil is back filled in order, layered and compacted, and horizontal installation is guaranteed.

4. If you have the conditions, you can put the removed soil in a bag and number it to keep the soil moisture unchanged, and backfill it in reverse order.

7. Communication Protocol（MODBUS）

Transmission mode: MODBUS-RTU,**Baud rate:** 9600bps,**Data bits:**8,**Stop bit:**1,**Check bit:**no

Slave address:the factory default is 01H (set according to the need,00H to FFH)

7.1 The 03H Function Code Example: Read The Moisture, Temperature & EC Value

The 03H Function Code Example: Read The Moisture, Temperature & EC Value

Host Scan Order(slave address:0x01)
01 <u>03 00 00 00 03</u> 05CB

Slave Response
01 <u>03 06</u> 01 16 03 E8 01 1E 688F

Temperature: (0116)H=(278)D,278/10=27.8℃

Moisture:(03E8)H=(1000)D,1000/10=100%

EC:(011E)H=(286)D=286/1000=0.28mS/cm

7.2 The 06H Function Code Example: Modify the slave address

Host Scan Order (Changed the 01H to 02H):

01 <u>06 00 30 </u>00 02 00804

Slave Response:

01 <u>06 00 30 </u>00 02 00804

Note:
1. All underlined is fixed bit;

2. The last two bytes is CRC check command.

Note: This product has been tested and complies with European CE requirements for EMC directive.

8. Troubleshooting

If some error occurs, such as no output or unreliable. Please disconnect the sensor first, then check if the sensor installation and connection is correct with the instruction manual.

If still not successful, please contact our company.

9. Support contacts:

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