



DeepL Five Pin Soil Four Parameter Sensor User Manual

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Overview

The five-pin soil four-parameter sensor is a stable performance with high sensitivity, fast response and stable output for a variety of soils. It is an important tool for observing and studying the occurrence, evolution and improvement of saline soils as well as water and salt dynamics. By measuring the dielectric constant of the soil, it can directly and stably reflect the true moisture content of various soils. It can measure the volume percentage of soil moisture, and is a soil moisture measurement method that meets current international standards. It can be buried in the soil for a long time, resistant to long-term electrolysis, corrosion resistant, vacuum potting, and completely waterproof.

Features

1. This sensor is designed for compact size.
2. High measurement accuracy, fast response time and good interchangeability.
3. Good sealing, can be directly buried in the soil and used without corrosion.
4. The soil quality is less affected and the application area

Scope of application

proper operation and efficient data transfer.

Suitable for soil moisture monitoring, scientific experiments, water-saving irrigation, greenhouse greenhouses, flowers and vegetables, grass pasture

Temperature and humidity, conductivity, PH, etc. in the field, soil quick test, plant culture, sewage treatment, fine agriculture, etc.

Product Information

Technical parameters

Measurement parameters: soil conductivity (EC value), temperature, moisture, PH value measurement range: 0 ~ 20000uS/cm, -40 ~ 80 °C, 0-100%, 3 ~ 9PH

Measurement accuracy: ±3%FS in the range of 0-10000uS/cm; ±20000uS/cm in the

range of 10000-20000uS/cm 5%FS, @ (brown soil 0%RH, 25°C) ±0.5°C ±2% within 0-50%, @ (brown soil, 30%, 25°C) ±3% within 50-100%, @ (brown soil, 60%, 25°C), ±0.1% RH

Resolution: 1uS/cm, 0.1°C, 0.1%, 0.1 Output

signal: RS485 (ModBus-RTU protocol)

- Supply voltage: 4.5 ~
- 30V DC Operating range:
- -30°C ~ 70°C Stability
- time: 1 second after
- power on Response time:

<1 second

Note: The performance data stated above was obtained under the test conditions using our testing system and

software. In order to continuously improve our products, we reserve the right to change the design features and specifications. The rights of the company are subject to change without notice.

Physical Parameters

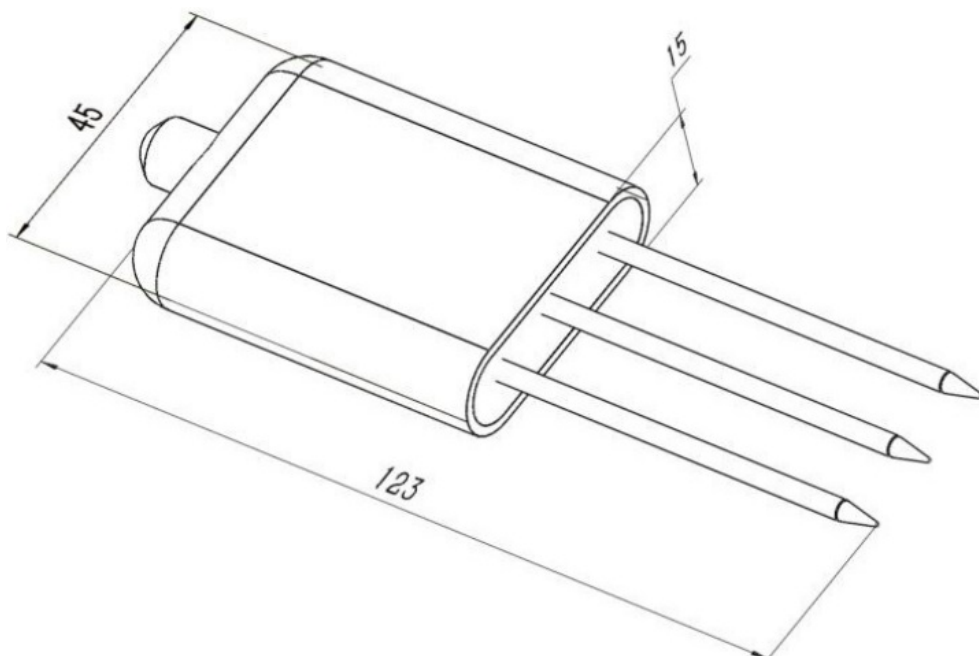
- Probe length: 55mm,
- @3mm Probe material:
- 316L stainless steel
- Sealing material: ABS engineering plastic, epoxy resin, waterproof grade 1P68
- Cable specification: 2 m standard (other cable lengths up to 1200 m can be
- Load capacity: voltage output: output resistance < 250Q; current output: < 600Q

Product Selection

customized)

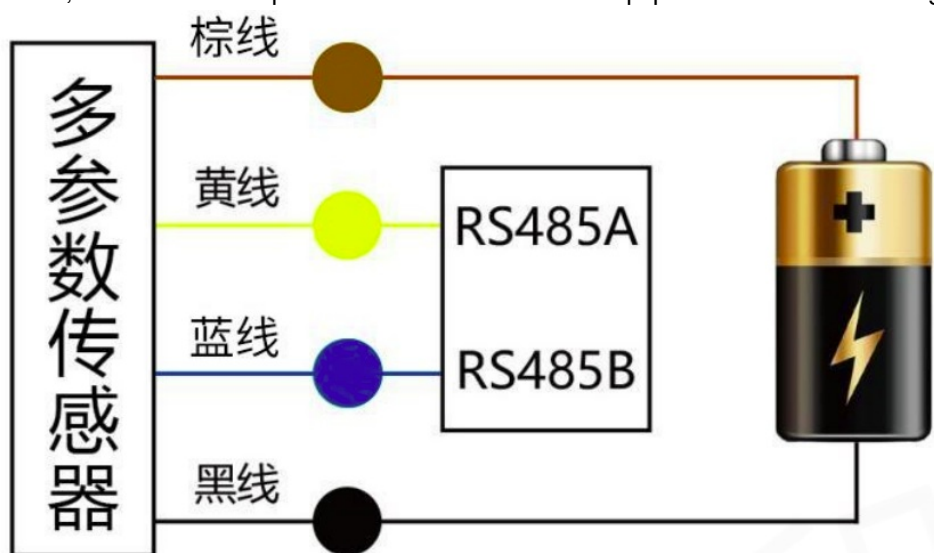
ZTS-					Company Code	
	3001-					
		TR-			Soil testing housing	
			THNPKPH-		Temperature Moisture NitrogenPhosphorus Pot assium PH	
			ECTHNPKEPH-		Conductivity Temperature MoistureNitrogen Pho sphorus Potassium PH	
					Temperature Moisture PH	
			THPH-			
			ECTHPH-		Conductivity Temperature Moisture PH	
					RS485 (Modbus-RTU protocol)	
				N01		

Form faactor



How to use

The equipment can be connected to a variety of data collectors containing differential inputs, data acquisition cards, remote data acquisition modules and other equipment with the following wiring instructions:



Data conversion method

RS485 signal (default address 01):

Standard Modbus-RTU protocol, baud rate: 4800; parity bits: none; data bits: 8; stop bits: 1

Change of address

For example: change the sensor with address 1 to address 2, host — slave

Original I address	Function Code	Starting Mail Storage High	Starting Mail Memory low	Start Address High	Start Address Low	CRC16Low	CRC16High
0X01	0X06	0X07	0XD0	0X00	0X02	0X08	0X86

If the sensor receives correctly, the data is returned in the original way.

Note: If you forget the original address of the sensor, you can use the broadcast address 0XFF instead. When using 0XFF, the host can only receive one slave, and the return address is still the original address, which can be used as a method of address query.

Querying Data

Register Address

Register Address	PLC or configuration address	Content	Operation	Definition Description
0000 H	40001 (Decimal)	Water content	Read Only	Real-time values of moisture content (expanded by a factor of 10)
0001 H	40002 (Decimal)	Temperature value	Read Only	Real-time temperature values (expanded by a factor of 10)
0002 H	40003 (Decimal)	Electrical conductivity	Read Only	Real-time conductivity values
0003 H	40004 (Decimal)	PH value	Read Only	PH real-time value (expanded by ten times)
0007 H	40008(Decimal)	Salinity	Read Only	Real-time values of salinity (for reference only)
0008 H	40009 (Decimal)	Total dissolved solids TDS	Read Only	TDS real-time values (for reference only)
0022 H	40035 (Decimal)	Conductivity temperature coefficient	Read in g and writing	0-100 corresponds to 0.0% -10.0% Default 0.0%
0023 H	40036 (Decimal)	Salinity factor	Read in g and writing	0-100 corresponds to 0.00-1.00 Default 55 (0.55)
0024 H	40037 (Decimal)	TD Coefficient	Read in g and writing	0-100 corresponds to 0.00-1.00 Default 50 (0.5)
0050 H	40081 (Decimal)	Temperature calibration value	Read in g and writing	Integer (expanded by a factor of 10)
0051 H	40082 (Decimal)	Moisture content calibration value	Read in g and writing	Integer (expanded by a factor of 10)
0052 H	40083 (Decimal)	Conductivity	Read in	Integer

		calibration values	g and writing	
0053 H	40083 (Decimal)	PH calibration value	Reading g and writing	Integer
07D0 H	42001 (Decimal)	Device Address	Reading g and writing	1~254 (factory default 1)
07D1 H	42002 (Decimal)	Device Baud Rate	Reading g and writing	0 for 24001 represents 48002 for 9600
Register Addresses	PLC or configuration address	Content	Operation	Definition Description
0000 H	40001(Decimal)	Water content	Read Only	Real time value of moisture content (expanded by 10)(times)
0001 H	40002(Decimal)	Temperature value	Read Only	Real-time temperature values (expanded by a factor of 10)
0002 H	40003(Decimal)	Electrical conductivity	Read-only	Real-time conductivity values
0003 H	40004(Decimal)	PH value	Read Only	PH real-time value (expanded by ten times)
07D0 H	42001(Decimal)	Device Address	Reading and writing	1~254 (factory default 1)
07D1 H	42002(Decimal)	Device Baud Rate	Reading and writing	0 for 24001 represents 48002 for 9600

Query the data of conductivity temperature moisture PH sensor (address is 1), master — slave

Address s	Function on Code	Start register address High	Start register address	Resist error length high	Resist error length low	CRC16Low	CRC16High
0X01	0X03	0X00	0X00	0X00	0X04	0X44	0X09

If the sensor receives correctly, the following data is returned, slave — host

Add s ees C o de	Fun cit e n Co de	Return the number of valid bytes	Moisture value	Temperature value	Conductivity value	Value	Check digit low byte	Check digit high byte
0x01	0x03	0x08	0x02 0x92	0xFF 0x9B	0x03 0xE8	0x000x38	0x57	0xB6

- Temperature calculation:
- Temperature data is uploaded in the form of a complementary code when the temperature is below 0 °C.

Temperature: FF9B H(hex) = -101 =>

- Temperature = -10.1 °C Moisture Calculation:
 - Moisture: 292 H (hexadecimal) = 658 => Moisture = 65.8%, i.e. 65.8% water content by volume of the soil.
- Conductivity calculation:
- Conductivity: 3E8 H (hexadecimal) = 1000 Conductivity = 1000 us/cm
 - PH Value Calculation:
 - PH value: 38H (hex) = 56 => PH value =5.6

Precautions for use

Warning

- Failure to wire in accordance with the wire sequence may result in damage to the device and to the instrument connected to the device.
- If the input power exceeds the maximum access power of this device, it will cause damage to this device.

Note

Please read this manual completely before use.



Do not attempt to insert the probe into stones or hard soil clods as this may damage the probe. A When moving the sensor out of the soil, do not tug and pull the cable directly.




The sensor probe should be inserted into the soil/substrate sufficiently to reduce operational errors and improve measurement accuracy.



It should be calibrated before each measurement, and for long-term use it is recommended to calibrate once every 1 month. The calibration frequency should be adjusted according to different application conditions (soil quality, moisture content, salt content, acidity and alkalinity of the application, etc.).



	<p>DeepL Five Pin Soil Four Parameter Sensor [pdf] User Manual</p> <p>Five Pin Soil Four Parameter Sensor, Five Pin, Soil Four Parameter Sensor, Parameter Sensor, Sensor</p>
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