TR07-WS-I20
Soil moisture temperature transmitter
4~20mA type user's Guide

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1. product description

1.1 product description

The transmitter is suitable for soil temperature and moisture measurement. It is calibrated with German original high-precision sensor and soil actual drying weighing method. It has high precision, fast response and stable output. It is less affected by soil salinity and is suitable for various soil types. It can be buried in the soil for a long time, resistant to long-term electrolysis, corrosion resistance, vacuum potting, and completely waterproof.

1.2 Scope of application

It is widely used in scientific experiments, water-saving irrigation, greenhouses, flowers and vegetables, grassland pastures, soil rapid measurement, plant cultivation, sewage treatment, grain storage and measurement of water content and temperature of various particulates.

1.3Main Specifications

1.3.1Measurement parameters and hardware parameters

Power supply：10~30V DC
power：1.2W
Temperature measurement range：-40℃~60℃
Moisture measurement range：0~100%
Temperature accuracy：±0.5℃
Moisture accuracy：±3%（When measuring frozen glacial layers, the water value will be low, requiring user compensation.）
Storage environment：-40℃~80℃
Output signal：4~20mA，Linear output
Response time: <1s
Sampling resistance: <100Ω

1.3.2 Physical parameter

Probe length: 70mm
Probe diameter: 3mm
Probe material: 304 stainless steel
Sealing material: epoxy resin (black flame retardant)
Cable length: standard two meters (RVV 4*0.3)
Protection level: IP68

2. How to use and precautions

2.1 Quick test method：

Select the appropriate measurement location, avoid the stone, ensure that the steel needle will not touch the hard object, throw off the topsoil according to the required measurement depth, keep the original soil tightness under the ground, hold the sensor vertically into the soil, insert It is not allowed to sway from side to side. It is recommended

to measure the average for multiple measurements within a small range of one measurement point.

2.2 Buried measurement：

Vertically dig pits with a diameter of >20cm. According to the measurement requirements, insert the sensor steel needle horizontally into the pit wall at a given depth, and fill the pits tightly. After a period of stability, it can be carried out for several days, several months or even longer. Measurement and recording.

2.3 Precautions：

1、The steel needle must be fully inserted into the soil during the measurement.
2. Avoid direct sunlight on the sensor body and cause the temperature to be too high. Use in the field to prevent lightning strikes.
3, do not violently bend the steel needle, do not pull the sensor out of the line, do not beat or violently hit the sensor.
4. The sensor protection class IP68 can soak the sensor in the water.
5. Due to the presence of radio frequency electromagnetic radiation in the air, it is not suitable to be energized in the air for a long time.

3. Equipment installation instructions

3.1 Equipment inspection before installation

Equipment List
■ Soil moisture temperature sensor equipment 1
■Qualification certificate, warranty card, wiring instructions, etc.
■12V/1A power supply 1 (optional)

3.2 Interface Description

Wide voltage power input can be 10~30V. The device comes standard with 2 independent analog outputs.

3.3 Wiring instructions

The specific line color is subject to the actual product received on site, refer to the following two

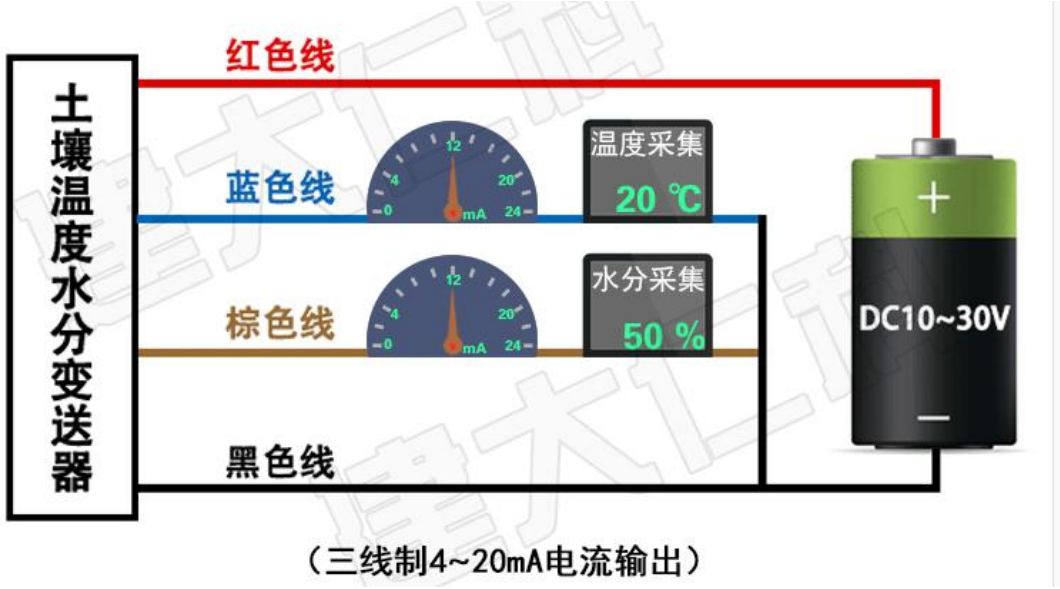
Line color 1

Line color	Description	Remarks
red	Power supply	10~30V DC
black	Negative power supply, negative temperature signal, negative moisture signal	GND
brown	Positive moisture signal	To the ground
blue	Positive temperature signal	To the ground

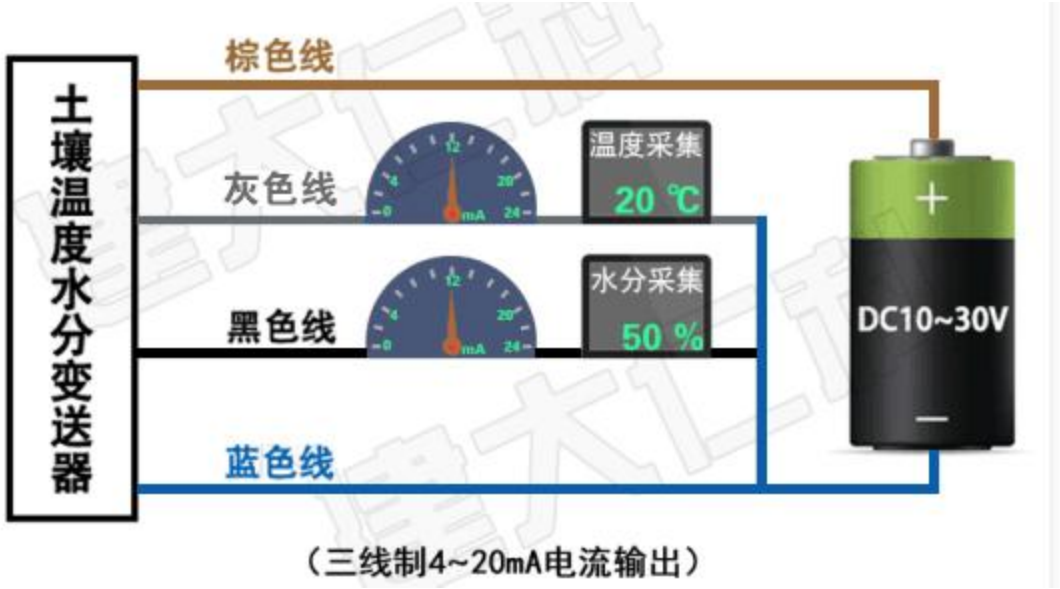
Line color 2

Line color	Description	Remarks
brown	Power supply	10~30V DC
blue	Negative power supply, negative temperature signal, negative moisture signal	GND

black	Positive moisture signal	To the ground
gray	Positive temperature signal	To the ground



Line color 1 usage plan



Line color 2 usage plan

4. Calculation method

For example, the range is -40~+80 degrees Celsius, 4~20mA output. When the output signal is 12mA, the current temperature value is calculated. The temperature range spans 120 degrees and is expressed by a 16 mA current signal. 120 degrees / 16 mA = 7.5 degrees / mA, that is, a current of 1 mA represents a temperature change of 7.5 degrees. The measured value is 12 mA - 4 mA = 8 mA. 8 mA * 7.5 degrees / mA = 60 degrees. 60+(-40)=20 degrees, the current temperature is 20 degrees.

5. Common problems and solutions

No output or output error

possible reason:

1) The range corresponding error causes the PLC to calculate the error. Please refer to the technical indicators in the first part for the range.

2) The wiring method is incorrect or the wiring sequence is wrong.

3) The distance between the transmitter and the collector is too long, causing signal disturbance.

4) The PLC collection port is damaged.

5) Equipment damage.

6. Dimensions