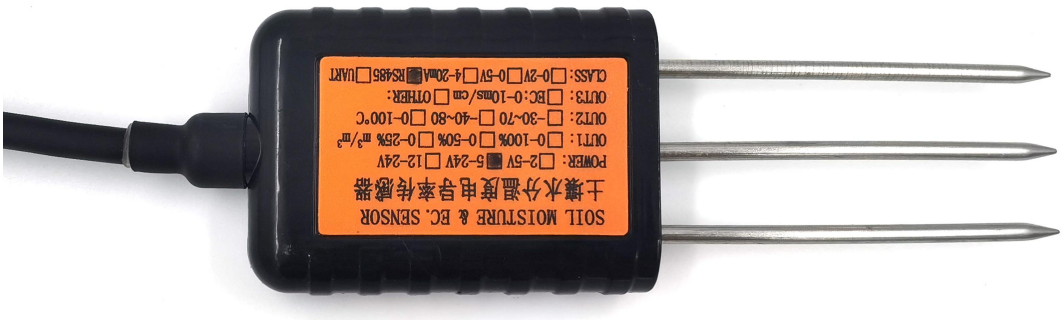
Soil Temp. Humi. EC Sensor

JW-S3S(Z3) Analog Output



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1. Product Introduction

The new developed soil moisture temperature EC three-in-one sensor is a soil sensor developed with a new technical scheme, which can measure soil moisture, temperature and conductivity at the same time, and carry out compensation calculation among parameters, eliminating the influence of conductivity on water, temperature on water and temperature on conductivity, can perform compensation operation and accurate evaluation.

This product can be used to measure the moisture content of saline-alkali land, which is not affected by the salt content of soil and can accurately measure the moisture content of soil.

It adopts imported epoxy resin, high quality stainless steel, more resistance to acid and alkali corrosion, steel needle isolation, never electrolysis, with more than 3 years of service life.

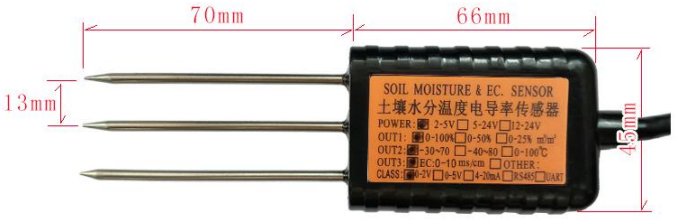
With the multi-directional function of power line, ground line and signal line, can prevent the damage caused by reverse connection, wrong connection and so on.

2. Technical Parameter

Element	Moisture			EC (Conductivity)		Temperature	
Measuring Range	0-100.00%			0-10mS/cm (25℃) (0-10.0EC)		-40.00℃ ~ 85.00℃	
Unit	V/V %,Volumetric moisture content of soil			uS/cm, mS/cm		℃ centigrade degree	
Resolution	0.01%			1 uS/cm		0.01℃	
Accuracy	±3%（0-53%）；±5%（>53%）			2%FS, 2% of the value		Error < 0.3℃（-10℃ ~ 50℃）others <0.6℃	
Swap Precision	< 3%			< 2%FS		< 0.3℃	
Repetition Measurement Error	< 2%			< 2%FS		< 0.2℃	
Response Time When Powered	1s			1s		1s	
Stability Time	< 2s			< 2s		< 2s	
Measurement principle	Frequency domain (FDR) add temperature and conductivity correction			EC measurement, with temperature compensation		RTD Thermal sensor, plus nonlinear correction	
Other Specification							
Output Signal	0-2V	0~3V	0~3.3V	0~4V	0~5V	0~10V	4~20mA
Power Supply	DC2~5V/ DC5~24V	DC2~5V/ DC5~24V	DC2~5V/ DC5~24V	DC2~5V/ DC7~24V	DC2~5V/ DC8~24V	DC13~24V	DC12~24V
Quiescent Current	Peak value <30mA · Average<10mA						
Protection Level	IP68						
Working Temp. Range	-40℃ ~ 85℃						
Measurement Area	center on the central probe in a cylinder withΦ7cm and 10cm height						
Cable Length	3.5m(Standard); others for optional						

3. Product Drawings

※ Probe length: 7cm
※ Probe diameter: 3mm
※ Material: 316 Stainless steel
※ Sealing material: Epoxy resin



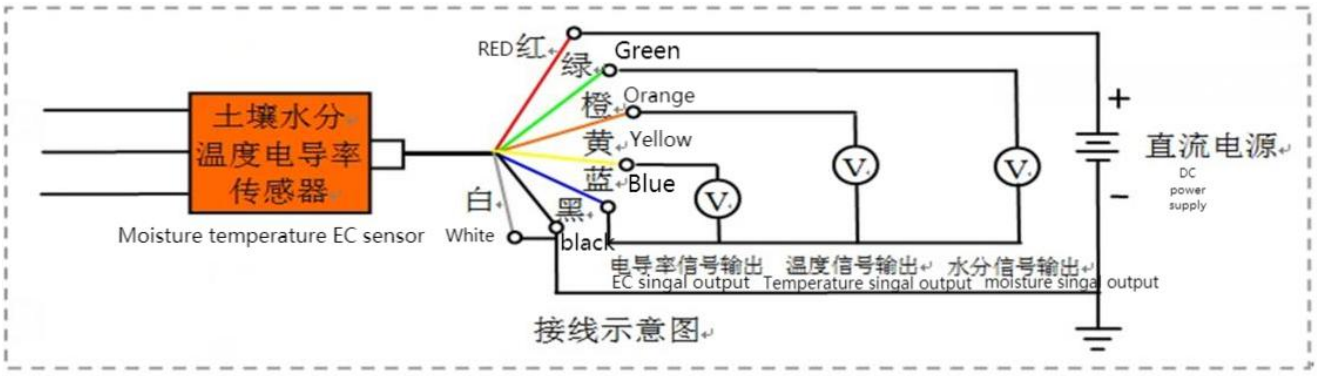
4. Output Conversion

Output	Moisture Measuring Range: 0-100%	Temperature Measuring Range: -30℃ ~ 70℃	EC Measuring range: 0-10mS/cm(25℃) (0-10.0EC)
Voltage 0~2V	Moisture%=measured voltage(V) *100/2	Temperature=measured voltage(V) *100/2-30	EC mS = measured voltage(V) *10/2 TDS ppm=measured voltage(V) *5000/2
Voltage 0~3V	Moisture%=measured voltage(V) *100/3	Temperature=measured voltage(V) *100/3-30	EC mS = measured voltage(V) *10/3 TDS ppm=measured voltage(V) *5000/3
Voltage 0~3.3V	Moisture%=measured voltage(V)* 100/3.3	Temperature=measured voltage(V) *100/3.3-30	EC mS = measured voltage(V) *10/3.3 TDS ppm=measured voltage(V) *5000/3.3
Voltage 0~4V	Moisture%=measured voltage(V)* 100/4	Temperature=measured voltage(V) *100/4-30	EC mS = measured voltage(V) *10/4 TDS ppm=measured voltage(V) *5000/4
Voltage 0~5V	Moisture%=measured voltage(V) *100/5	Temperature=measured voltage(V) *100/5-30	EC mS = measured voltage(V) *10/5 TDS ppm=measured voltage(V) *5000/5
Voltage 0~10V	Moisture%=measured voltage(V) *100/10	Temperature=measured voltage(V) *100/10-30	EC mS = measured voltage(V) *10/10 TDS ppm=measured voltage(V) *5000/10

5. Wiring Definition

7-Core Cable

Red: VCC
Black: GND
Green: Moisture
Orange: Temperature
Yellow: EC
White: GND (Factory Set Use)



6. How To Use

7.1 Communication Parameter Setting

The SET end of the sensor is connected to a high level, and the sensor is in the setting mode, allowing the modification of the internal EEPROM. The communication parameters displayed by the sensor at this time are fixed as: station address: 255, 9600, n, 8,1. You can set the sensor parameters to change the value of registers 0x200-0x204.

The SET end of the sensor is connected to a low level, and the sensor is in acquisition mode. At this point, the communication parameters set inside the sensor will take effect, that is, the communication will run according to the parameters defined by 0x200-0x204.

In acquisition mode, the internal parameters cannot be modified, even if the sensor responds to the write command · Internal parameters will not be modified.

7.2 Soil measurement

Surface instant measurement：Choose a suitable measurement site, avoid rocks, and ensure that the steel needle will not hit anything hard. Cut the topsoil according to the required measuring depth to maintain the original tightness of the soil below. Hold the sensor and insert it vertically into the soil, do not move it from side to side during insertion. Multiple measurements and averaging are recommended for a small range of measurement points.

Buried measurement：Dig a hole with a diameter of more than 20cm vertically, insert the steel needle of the sensor horizontally into the wall of the hole at a given depth, fill the hole tightly, and measure and record it for several days, months or even longer after it is stabilized for a period of time.

Attention

1. The steel needles must all be inserted into the soil during the measurement
2. Avoid excessive temperature caused by direct sunlight on the sensor body. Lightning protection should be paid to field use.
3. Do not bend the steel needle violently, do not pull the lead wire of the sensor; do not beat or slam the sensor violently.
4. The protection level of the sensor is IP68, the sensor can be wholly soaked in water.

5. When multiple sensors are installed in close proximity and powered on at the same time, the installation interval shall not be less than 10cm.

6. Due to the presence of radio frequency electromagnetic radiation in the air, It is not advisable to stay in the state of power in the air for a long time.

Remark	Series	Power Supply & Output	Cable Length	
BGT				
	SEC			
		A		Power:DC2~5V; **Output:0~2V**
		B		Power:DC5~24V; **Output:0~2V**
		C		Power:DC2~5V; **Output:0~3V**
		D		Power:DC5~24V; **Output:0~3V**
		E		Power:DC2~5V; **Output:0~3.3V**
		F		Power:DC5~24V; **Output:0~3.3V**
		G		Power:DC2~5V; **Output:0~4V**
		H		Power:DC7~24V; **Output:0~4V**
		J		Power:DC2~5V; **Output:0~5V**
		K		Power:DC7~24V; **Output:0~5V**
		L		Power:DC2~5V; **Output:0~5V**
		M		Power:DC7~24V; **Output:0~5V**
		N		Power:DC13~24V; **Output:0~10V**
		P		Power:DC12~24V; **Output:4~24mA**
			3500	Unit:mm
			Other	Unit:mm

Example: BGT-SEC-C3500 Power:DC2~5V; Output:0~3V; Cable 3.5m