

TUBULAR SOIL MOISTURE MONITORING STATION

Introduction

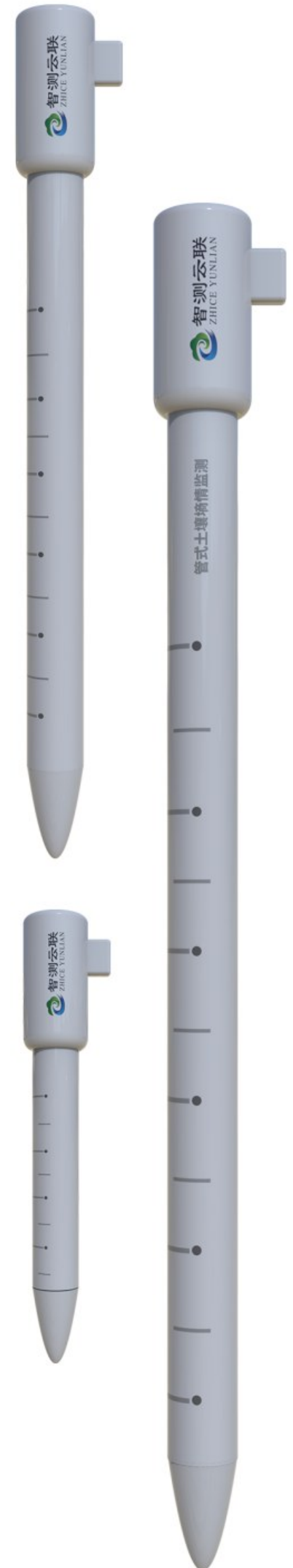
Zhice Yunlian tubular soil moisture monitoring station is a high-precision monitoring device for layered measurement of soil profile temperature, humidity and electrical conductivity.

It integrates multi-depth soil parameter collection, intelligent data transmission and automatic threshold early warning. Widely applied in smart greenhouses, smart orchards, smart farmlands, precision irrigation, ecological restoration, farmland water conservancy and other agricultural & ecological engineering fields.

Multiple specifications with customizable lengths are available. It can cooperate with pole-mounted monitoring stations or integrate solar panels.

Advantages

- Precise monitoring
- Integrated all-in-one assembly
- No on-site debugging
- Stable data transmission guarantee



Structure

FDR Frequency Domain Reflection Method

Accurately measure soil temperature and moisture with precision up to $\pm 2\%$.

Modbus-RTU485

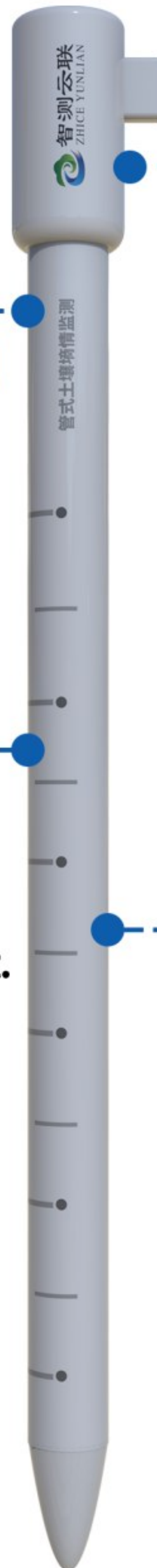
Maximum communication distance up to 2000 meters, supporting secondary development.

Non-contact Measurement

Sensors are sealed inside the PVC housing without direct soil contact. It effectively reduces measurement interference from soil salt ions, fertilizers, pesticides and irrigation activities, protects internal circuits and extends equipment service life.

Anti-corrosion & Waterproof Material

Durable, waterproof, dustproof and corrosion-resistant, adaptable to all complex soil environments with long service life.





Measurement Parameter Accuracy

Parameter Item	Detailed Specification
Operating Temperature	-20℃ ~ +70℃
Measuring Range	Soil moisture: dry soil ~ saturated soil; Soil temperature: -20℃ ~ 70℃
Measurement Accuracy	Soil moisture: ±2% (laboratory environment, 25℃); Soil temperature: ±0.5℃
Layer Spacing	10cm or 20cm
Power Supply Mode	DC 10–18V
Screen Size	2.4 inch
Measuring Principle	FDR Frequency Domain Reflection Method
Solar Panel	15V 6W
Storage Battery	7.4V 6800mA
Protection Grade	IP67
Communication Mode	RS485, 4G
Sampling Time	≤60s
Stabilization Time	≤10s
Induction Range	Within 15cm outside the sensor tube wall



Specifications

Layers	Description Spacing 10CM
3	3-layer soil temperature & humidity sensor
4	4-layer soil temperature & humidity sensor
5	5-layer soil temperature & humidity sensor
6	6-layer soil temperature & humidity sensor
7	7-layer soil temperature & humidity sensor
8	8-layer soil temperature & humidity sensor
9	9-layer soil temperature & humidity sensor
10	10-layer soil temperature & humidity sensor

*Custom 20cm spacing is also available



Precautions for Use

- ★ The sensor must be used strictly in accordance with this installation manual.
- ★ When multiple sensors work simultaneously, keep a distance of more than 3 meters between each unit.
- ★ Restricted by the measurement principle, no electromagnetic cables or strong magnetic radiation interference shall exist within a 3-meter radius centered on the sensor measuring point, to avoid huge measurement errors or permanent damage to the sensor.
- ★ The installation environment shall match the sensor measuring range; over-range measurement and other irregular operations are prohibited.
- ★ Install the sensor away from strong acid, strong alkali, heavy oil pollution and heavy metal contaminated areas.
- ★ This is a dedicated soil sensor; do not use it to measure other substances.
- ★ No strong vibration is allowed at the installation site.
- ★ Avoid strong external impact force on the sensor.
- ★ Disassembly by users themselves is forbidden.

Installation Instructions



1. Stand the soil sampler vertically on the ground. Hold the handle tightly and rotate clockwise downward slowly.
Note: Do not apply excessive force; rotate multiple full circles to prevent the drill bit from deviating and distorting the hole.



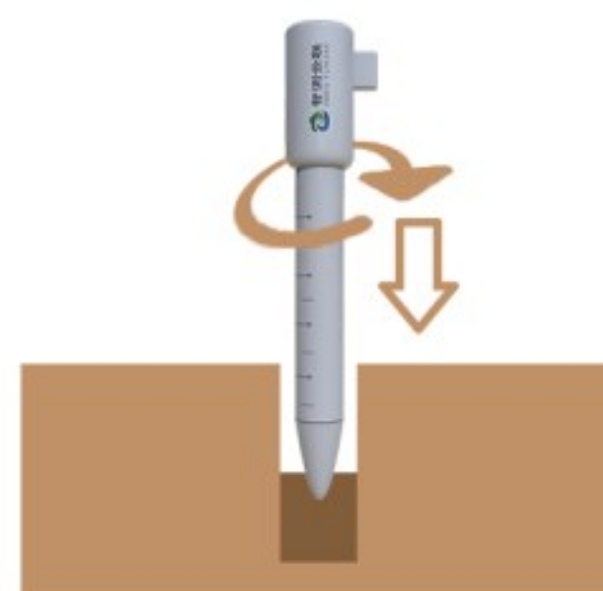
2. Pull the soil sampler out of the hole, pour the soil into a bucket to make mud slurry.
Note: Discard the first layer of mixed impurity soil without collection.



3. Continue drilling and fetch soil repeatedly. Lower the sensor gently into the hole (do not push hard to the bottom) to test whether the hole depth fits. If jamming occurs, use mud to amend the hole to ensure smooth insertion and extraction until the hole depth aligns exactly with the zero scale line marked on the sensor.

4. Pick out impurities, stones, roots and insoluble soil clods from the bucket soil. Add appropriate water and stir thoroughly to a thick paste consistency (not thin sesame paste texture).

Slowly pour the mud slurry into the hole to roughly half the hole depth.



5. Lower the sensor slowly into the hole, rotate clockwise and press down gently. Too fast insertion will trap air bubbles.
Note: Do not pull the sensor upward during rotation, which will reintroduce air into the soil layer.



6. Once the sensor reaches the correct depth, mud slurry will overflow around the equipment, marking completion of grouting. The sensor insertion depth aligns with the hole opening.

Clear excess mud within 3CM around the tube to prevent surface crust from blocking water infiltration.