



SOIL MOISTURE MONITORING FOR SMART IRRIGATION

To measure the moisture content in soil in real time, enabling a farmer to irrigate only when necessary, ensuring optimal root hydration, healthier crops, and significant water savings.



Over-irrigation is as dangerous as under-irrigation. Too much water suffocates roots and wastes energy. Too little leads to crop stress and yield loss. And the worst part? You can't see it — the soil looks the same on top. By the time symptoms show, damage is already done.

The farmer needs real-time, in-the-root-zone visibility to irrigate with confidence, not guesswork.



A SOIL MOISTURE SENSOR IS BURIED AT ROOT LEVEL AND CONTINUOUSLY MEASURES THE VOLUMETRIC WATER CONTENT IN THE SOIL. THIS DATA IS TRANSMITTED TO A MONITORING UNIT OR IRRIGATION CONTROLLER.

When the moisture level drops below a certain threshold, the system can either:

- Alert the farmer, or
- Automatically trigger irrigation

Once the upper threshold is reached, watering stops — ensuring precision delivery, no more, no less.





FUNCTIONAL WORKFLOW

➤ SENSOR INSTALLATION ➤ REAL-TIME MONITORING ➤ THRESHOLD-BASED CONTROL

- Placed at root depth (e.g., 15–30 cm for shallow-root crops; 60 cm+ for trees)
- Can be placed in multiple zones for accuracy

- Sensor sends moisture data at fixed intervals
- Measured in volumetric content (%), or relative scale (0-1023 analogue, or 0–1 for digital systems)

If soil moisture drops below the lower threshold:

- Trigger irrigation system or notify the farmer

If it reaches the upper threshold:

- Irrigation stops automatically (or alert is cleared)

➤ INTEGRATION WITH WEATHER DATA

- Combine with rainfall data or weather forecasts to adjust irrigation schedules

➤ HISTORICAL DATA LOGGING

- Helps understand soil behaviour over seasons
- Reveals crop-specific water demands
- Supports water auditing and environmental compliance



KEY BENEFITS



➤ WATER CONSERVATION:

Irrigate only when truly needed.

➤ CROP HEALTH:

Maintain ideal root moisture levels for maximum yield.





011 988 4194
info@virtualgroup.co.za
www.virtualgroup.co.za

AGRICULTURE



Powered by:

VIRTUAL IOT SOLUTIONS



KEY BENEFITS



➤ **IRRIGATION AUTOMATION:**
Remove human error and timing uncertainty.

➤ **SOIL INTELLIGENCE:**
Understand soil retention behaviour over time.



➤ **PRECISION AGRICULTURE:**
Apply data-driven farming strategies that improve ROI.

