

Operational description – AquaCheck soil moisture probes.

AquaCheck soil moisture probes are designed to measure the amount of moisture available to the plant. This is accomplished by measuring the dielectric change in the soil as the moisture increases or decreases. The dielectric change is measured as a change in capacitance across conductive rings situated on the inner wall of the probe.

The measurement of the capacitance is achieved by resonating the rings (forming the capacitor) and an inductor at a very low level. The output of this tank circuit is fed to a divider and counter to measure the frequency on resonance.

During normal operation the probe measures the soil moisture at 5,10,15,30 or 60 minute intervals. The probe may have 2, 4 or 6 sensors, depending on the model. Each sensor is turned on for approximately 300 milliseconds. This is done for each sensor in order from the top to the bottom sensor.

The data from the sensors are processed and stored in non-volatile memory (Radio version) or retrieved via the data cable (non-radio probes).

For the Radio probes, the radio normally wakes every 15 seconds for a period of 100 milliseconds. If another device is requesting the probe to wake up, the radio will stay awake for 20 seconds after the last interaction with the specific probe.

Data is transferred to the requesting device (eg. a hand logger). The requesting device will request one log at a time, the probe responds with the data. This will continue until all the unread data is collected from the probe.

The requesting device may also issue service commands to the probe. These will be setting the time/date, setting the logging interval and requesting a new reading.