# AT
**Delta-T Devices**

# Soil Moisture
# Measurement

# The **HH2 Moisture Meter** provides instant readout from most Delta-T soil moisture sensors.

- Immediate display of water content
- Store up to 1500 readings
- Reads ML3, SM150T, PR2, PR2 SDI-12 or WET Sensor

## Overview

The HH2 offers impressive functionality in a compact hand-held unit designed for field use. Readings are displayed on the LCD and can be stored to memory for later download to a PC. Up to 1500 time-stamped readings can be stored.

### Applications

- Reads ML3*, SM150T* and WET Sensors
- Reads PR2/6 and PR2/4 Profile Probes (analog and SDI-12)

## Simple versatile operation

The HH2 can be operated with one hand for convenience in the field. Each time-stamped reading includes a unique sample number, a plot identification letter (A to Z) and a sensor location number (1 to 255).
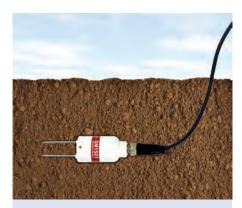
Data is transferred to a PC using the RS232 cable provided with each unit. See ordering information for USB connection.

HH2Read software downloads data in comma-separated ASCII (.csv) format ready for opening in Excel. Data can be merged with existing downloaded data, using the free Dataset Import Wizard.

## Reading Profile Probes

The HH2 Moisture Meter can take readings from a PR2 Profile Probe wherever access tubes have been installed. With an installed array of access tubes, one HH2/PR2 combination can profile large areas quickly. The HH2 auto-detects the number of sensors in each Profile Probe.

The HH2 can also display readings from SDI-12 Profiles Probes. Please see page 12 for details.

Buriable Probes ML3 and SM150T Sensors can be buried and connected to a data logger for continuous monitoring - see pages 4 and 5.

## Reading WET Sensors

The HH2 is able to display the 3 outputs produced by the WET Sensor and store them until downloaded to a PC. Standard calibrations for Mineral, Organic, Clay, or Sand media can be selected. In addition, user-defined custom calibrations can be entered for soils and other substrates.

User-selectable options allow pore water and/or bulk conductivity to be displayed, and also the permittivity. The HH2 provides user-selectable temperature compensation.

## Horticultural media calibrations

The WET Sensor is supplied with default calibrations for generic mineral, organic, sand and clay soils. WET-GH-1 substrate calibrations can be ordered as a set, for a variety of horticultural media including coir, peat-based potting mixes and greenhouse "mineral" soils. WET-ST-1 substrate calibrations can be ordered for mineral wool (vertical and horizontal). See page 7 for calibrations ordering information.

## Water deficit

This reading indicates the amount of water needed (in mm) to restore the soil to field capacity, down to a user-defined rooting depth. The HH2 calculates water deficit from the user-defined field capacity and from readings taken either from a single sensor or the individual sensors of a Profile Probe. The HH2 User Manual contains tables of standard soil classifications and their associated field capacities.

## Soil types

Standard calibrations for generalised mineral and organic soils are supplied with the HH2 for use with the ML3*, Profile Probe and SM150T* Sensors. The HH2 also enables up to 5 extra user-defined soil calibrations to be characterised and stored. The soil calibration can be switched at any time during the collection of data, and can be specified separately for each sensor position on a single Profile Probe.

### Ordering Information

**Moisture Meter type HH2** with integral 25-pin D-connector, battery, RS232 cable and 25 to 9 pin adapter.

If the HH2 is intended for use with a single ML3 ThetaProbe or a single WET Sensor it can be ordered as part of a convenient kit - see page 9.

**USB to RS232 Adapter Cable type USB-RS232.** 100 cm cable, connects 9 pin RS232 to USB (for connection to PC).

### Brief Specification (full spec on page 23)

| | |
|---|---|
| **Range** | Zero to saturation (soil water content) 0 to 1.5 V (voltage range) |
| **Accuracy** | ± 0.13% of mV reading ± 1 mV |
| **Resolution** | 1 mV |
| **Reading storage** | Typically 500 to 1500 readings (depends on sensor and settings) |
| **Connection** | 1 x male 25-pin D-connector used for sensor and RS232 communications |
| **Environmental** | IP54, 0 to 40°C (operating) |
| **Size, weight** | 125 x 80 x 40 mm, 450 g |
| **Battery type, life** | 9 V alkaline 6LR61 (PP3), ~ 5,000 readings |

\* NB The ML3 or SM150T can be used as a portable moisture probe with the HH2 Meter but the HH2 does not provide temperature indication from the SM150T or ML3