

## SPECIFICATIONS

### Range:

( $\epsilon_a$ ) : 1 (air) to 50  
Soil volumetric water content : 0  
– 0.57 m<sup>3</sup>/m<sup>3</sup> (0 -57% VWC)

### Accuracy:

( $\epsilon_a$ ) :  $\pm 0.5$  from ( $\epsilon_a$ ) of 2 to 10,  $\pm 2.5$   
from ( $\epsilon_a$ ) of 10 to 50 (VWC)  
VWC: Using standard calibration  
equation:  $\pm 0.03$  m<sup>3</sup>/m<sup>3</sup> ( $\pm 3\%$   
VWC) typical in mineral soils that  
have solution electrical conductivity  
< 10 dS/m Using soil specific  
calibration,  $\pm 0.02$  m<sup>3</sup>/m<sup>3</sup> ( $\pm 2\%$   
VWC) in any soil

### Resolution:

( $\epsilon_a$ ) : 0.1 from ea of 1 to 30, 0.2 from  
( $\epsilon_a$ ) of 30 to 50  
VWC: 0.0008 m<sup>3</sup>/m<sup>3</sup> (0.08% VWC)  
in mineral soils from 0 to 0.50 m<sup>3</sup>/  
m<sup>3</sup> (0-50% VWC)

### Measurement Time:

10 ms (milliseconds)

### Power:

3 VDC @ 12mA  
to  
15 VDC @ 15 mA

### Output:

300 – 1250 mV, independent of  
excitation voltage

### Operating Temperature:

0°C to +50°C

### Survival Temperature:

-40°C to +50°C

### Connector Types:

3.5 mm “stereo” plug or stripped and  
tinned lead wires

### Cable Length:

5 m

### Dimensions:

14.5 cm x 3.3 cm x 0.7 cm

### Datalogger Compatibility:

Decagon Em50, Em5b and Procheck

DocRef: Ver1.0

# 10HS Sensor

The 10HS measures the dielectric constant of the soil in order to find its volumetric water content (VWC). It obtains volumetric water content by measuring the dielectric constant of the media through the utilization of capacitance/frequency domain technology. Since the dielectric constant of water is much higher than that of air or soil minerals, the dielectric constant of the soil is a sensitive measure of volumetric water content. The 10HS has a low power requirement and very high resolution. This gives the ability to make many measurements (i.e. hourly) over a long period of time with minimal battery usage. In addition, the 10HS sensors incorporate a high frequency oscillation, which allows the sensor to accurately measure soil moisture in any soil with minimal salinity and textural effects.

An on-board voltage regulator allows factory calibrations to be used with any excitation voltage above 3V. In addition, the list of factory calibrations for the 10HS includes a dielectric calibration for use with the Topp Equation or other applicable dielectric to volumetric water content conversion equations.

### Applications:

- Irrigation scheduling
- Vadose zone monitoring
- Plant-soil-water interaction studies

### Features:

- Onboard voltage regulator allows the sensor to be powered with a wide range of excitation voltages (3-15 VDC) without changing the calibration
- Large sensing (1100 cubic centimeters) allowing you to have a more representative measurement of soil VWC

### Notes:

- The 10HS sensor is recommended for mineral soil applications where soil heterogeneity is a concern.
- The 10HS sensor is not recommended for use with growing media such as Rockwool or Perlite, because the sensitivity of this sensor at dielectrics above 50 (approx. 57% VWC) drops significantly.



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