



## High Resolution, Low cost (VWC) Sensor

Large volume of influence with minimal salinity and textural effects

### Overview

The 10HS sensor is the perfect solution to accurately measure volumetric water content (VWC) where a large volume of influence is needed. It is a low cost, small sensor that can be easily installed in any soil or soilless media.

The 10HS sensor measures volumetric water content via the dielectric constant of the soil using capacitance/ frequency domain technology. The 10HS has 1 litre area of influence which allows it to measure three times the volume of influence than smaller sensors. The 10HS uses a 70 MHz frequency to minimize salinity and textural effects which makes it accurate in most soils and ideal for agricultural and standard scientific projects. The 10HS sensor can be used for different purposes setting up irrigation schedules, monitoring Vadose zones and for plant-soil-water interaction studies.

A special coating makes the 10HS soil moisture sensor resistant to salts. Very low power consumption and a high resolution provide increased precision over a longer period of time.

The 10HS's analogue signal means no-hassle integration with systems manufactured by other companies (such as Campbell Scientific). An on-board voltage regulator allows the Decagon factory calibrations to be used with any excitation voltage between 3 and 15V.

The 10HS sensor's high resolution allows the tracking of water use at an hourly or daily basis. The 10HS's Voltage output is proportional to water content.

### Specifications

Measurement		soil site specific calibration, $\pm 0.02$ m <sup>3</sup> /m <sup>3</sup> ( $\pm 2\%$ VWC)	
Range	Apparent dielectric permittivity ( $\epsilon_a$ ): 1 (air) to 50 Soil volumetric water content: 0 – 0.57 m <sup>3</sup> /m <sup>3</sup> (0 – 57% VWC)	Resolution	( $\epsilon_a$ ): 0.1 from $\epsilon_a$ 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)
Accuracy	Apparent Dielectric Permittivity ( $\epsilon_a$ ): $\pm 0.5$ from ( $\epsilon_a$ ) of 2 to 10, $\pm 2.5$ from ( $\epsilon_a$ ) of 10 to 50 (VWC) VWC: Using standard calibration equation: $\pm 0.05$ m <sup>3</sup> /m <sup>3</sup> ( $\pm 5\%$ VWC) typical in mineral soils. Using	<b>Power</b> Power requirements: 3VDC @ 12mA to 15 VDC @ 15 mA On board voltage regulator allows	



10HS sensor to be used with any excitation voltage above 3V

### Operating Conditions

Operating Temperature: 0 – 50°C

### Interface

Frequency 70 MHz

Output


300 (dry soil) – 1250 (saturated) mV, independent of excitation voltage

### Mechanical

Connector Types Stripped and tinned lead wires.

Cable Length 5 m standard

Dimensions Dimensions 14.5 x 3.3 x 0.7 cm

For comprehensive details, visit: [www.campbellsci.ca/10hs-](http://www.campbellsci.ca/10hs-) 



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