

Soil Volumetric Water Content/Salinity Probes

Models EasyAG II[®] and EnviroSMART[™]

The EasyAG II[®] and EnviroSMART[™] probes, manufactured by Sentek, provide soil water content profile and/or soil volumetric ion content (VIC) for irrigation and fertigation management applications. These probes include several sensors that measure soil water/salinity at multiple depths. Around each sensor, the probe creates a high frequency electrical field that extends through the access tube into the soil. Electrical capacitance is then measured and soil water content/salinity is determined from those measurements.

The EasyAG II and EnviroSMART probes can be integrated with a Campbell Scientific datalogger or weather station. Integrating the probes into our data acquisition systems allows the data to be telemetered back to a field station or remote computer.

Soil Water Content Profile

The standard sensors provide soil water content profiles for the range of oven dry to saturation. These sensors output an SDI-12 signal that our CR200-series, CR800, CR850, CR1000, CR3000, and CR5000 dataloggers can measure.

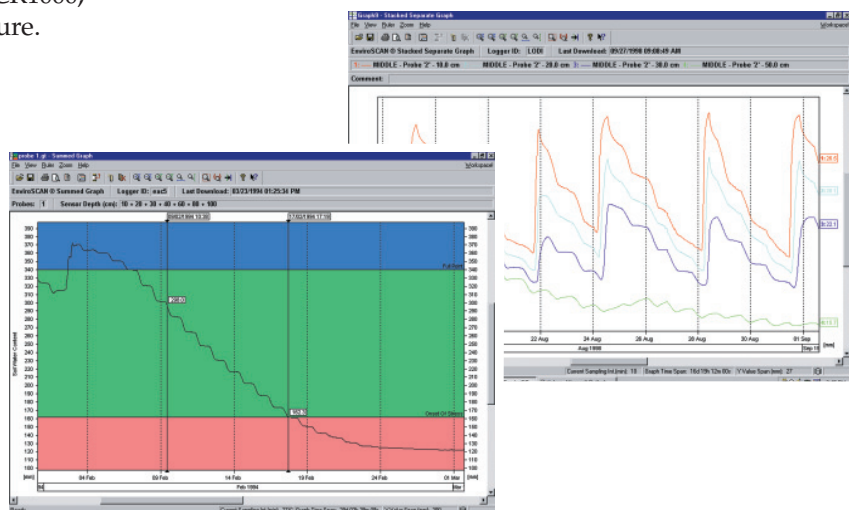
Soil Volumetric Ion Content (VIC)

The optional TriSCAN sensors determine VIC in sands and sandy loams; currently the TriSCAN is not suitable for clays. The TriSCAN sensors output an SDI-12 signal that our CR200-series, CR800, CR850, CR1000, CR3000, and CR5000 dataloggers can measure.



Specialized tools and techniques offered by Campbell Scientific simplify probe installation while minimizing soil disturbance. The EasyAG II (shown above) can be installed in soils ranging from light sand to heavy clay.

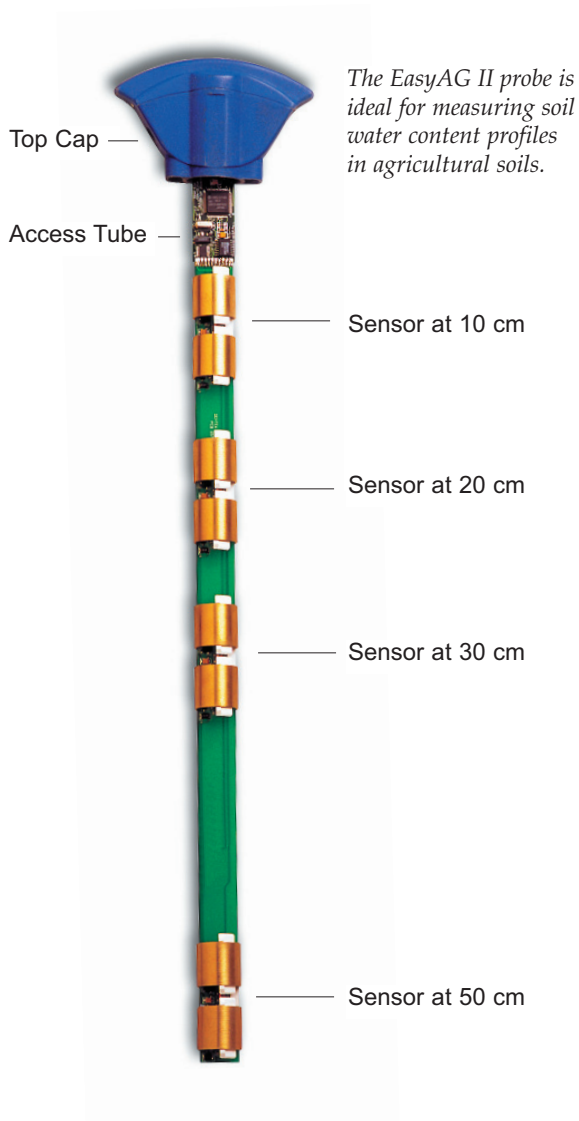
Software options for displaying the EasyAG II or EnviroSMART data include our LoggerNet Datalogger Support Software or where compatible, Irrimax, Sentek's dedicated irrigation scheduling software (shown).



EasyAG II

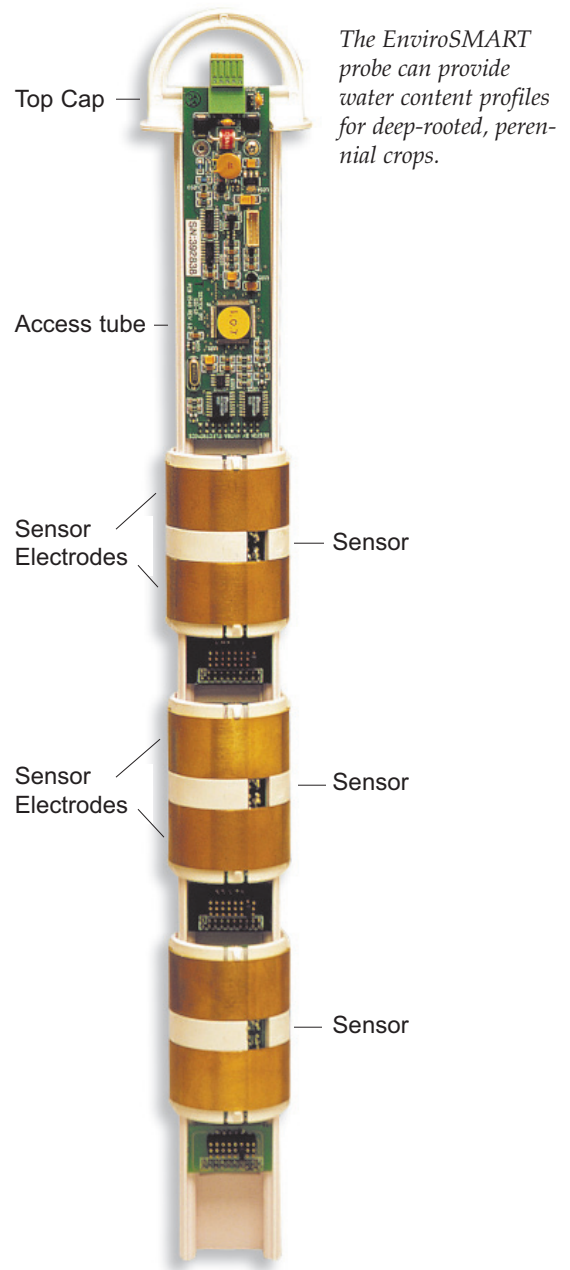
EasyAG II is intended for cultivated soils of good tilth, commonly found in vegetable production areas. It is unsuitable for stony soils where the average stone size is greater than 10 mm; EnviroSMART should be used for those applications.

Campbell Scientific offers EasyAG II probes that provide measurements at depths of 10 cm, 20 cm, 30 cm, and 50 cm. The probes can either include the standard water content sensors or the TriSCAN salinity sensors.



EnviroSMART

EnviroSMART is recommended for higher accuracy research measurements, measurements deeper than 80 cm, or stony soils. It is customized for individual applications by adding sensors at user-specified measurement depths. The standard water content sensors and the TriSCAN sensors can be combined at any 10 cm interval. The maximum measurement depth of the standard configuration is 6 feet (2 m); deeper measurements are possible with special provisions.



Specifications

General

	EasyAG II	EnviroSMART
<i>Number of Sensors per Standard Probe</i>	4 maximum	16 maximum
<i>Sensor Measuring Principle</i>	high frequency capacitance	high frequency capacitance
<i>Sphere of Influence</i>	99% of the reading is taken within a 10 cm radius from the outside of the access tube	99% of the reading is taken within a 10 cm radius from the outside of the access tube
<i>Sensor Diameter</i>	1.04" (2.65 cm)	2" (5.05 cm)
<i>Access Tube Diameter</i>	1.26" (3.2 cm)	2.22" (5.65 cm)
<i>Time to Read One Sensor</i>	1.1 seconds	1.1 seconds
<i>Interface Measuring Principle</i>	16-bit pulse count	16-bit pulse count

Volumetric Water Content

	EasyAG II	EnviroSMART
<i>Output</i>	SDI-12	SDI-12
<i>Protocol Options</i>	SDI-12	SDI-12
<i>Maximum Cable Length</i>	200 ft (60 m)*	200 ft (60 m)*
<i>Output Resolution</i>	16 bit	16 bit
<i>Current Consumption</i>	250 μ A sleep, 66 mA standby, 100 mA sampling	250 μ A sleep, 66 mA standby, 100 mA sampling
<i>Accuracy when Calibrated</i>	R ² =0.89 based on field calibrations	R ² =0.99 based on field calibrations
<i>Resolution</i>	0.008%	0.008%
<i>Precision</i>	\pm 0.06% volume	\pm 0.03% volume
<i>Measurement Range</i>	oven dry to saturation	oven dry to saturation
<i>Temperature Effects</i>	\pm 3%, 5° to 35°C	\pm 3%, 5° to 35°C
<i>Operating Range</i>	-20° to +75°C	-20° to +75°C

*Based on SENSDI12CBL-L cable.

Specifications (continued)

Salinity

Output: SDI-12

Maximum Cable Length: 200 ft (60 m) based on SENSDI12CBL-L cable.

Output Resolution: 16 bit

Current Consumption: 250 μ A sleep, 66 mA standby, 100 mA sampling

Operating Range: -20° to +75°C

Accuracy: $\pm 1.8\%$ with a repeatable change of VIC of 1 μ S cm^{-1} in saturated soil conditions at low EC 55 μ S cm^{-1} ;
 $\pm 0.4\%$ with a repeatable change of VIC of 25 μ S cm^{-1} in saturated soil conditions at medium EC 5600 μ S cm^{-1} .
Sentek's field testing have achieved $r^2 = 0.9$.

