

## SOIL MOISTURE SENSOR



**GS3**

The Decagon GS3 sensor measure soil moisture, soil temperature and EC. The sensor has been optimized for use in soilless substrates, giving it a wider range of EC measurement and an increased temperature range. The steel needles not only slice through the substrates for perfect contact, but they also improve the sensor's ability to measure EC in porous substrates such as peat or perlite. The sensor also works well in mineral soils. The GS3 measures water content, temperature, and EC independently. Its 70 MHz frequency minimizes salinity and textural effects, making it accurate

in most soil or soilless media. Stainless steel needles have an extended surface area to optimize EC measurements, while minimizing substrate disturbance during insertion.

<b>ACCURACY</b>	
Apparent Dielectric Permittivity ( $\epsilon_a$ ):	$\pm 1 \epsilon_a$ (unitless) from 1 - 40 (soil range), $\pm 15\%$ from 40 - 80
Soil Volumetric Water Content (VWC):	Using a generic calibration: $\pm 0.03 \text{ m}^3/\text{m}^3$ ( $\pm 3\% \text{ VWC}$ ) typical in mineral soils that have solution electrical conductivity $< 10 \text{ dS/m}$ Using medium specific calibration, $\pm 0.01 - 0.02 \text{ m}^3/\text{m}^3$ ( $\pm 1 - 2\% \text{ VWC}$ ) in any porous medium
Electrical Conductivity (EC):	$\pm 10\%$ from 0 to $10 \text{ dS/m}$ , user calibration required above $10 \text{ dS/m}$
Temperature:	$\pm 1^\circ\text{C}$
<b>RESOLUTION</b>	
$\epsilon_a$ :	$0.1 \epsilon_a$ (unitless) from 1 - 20, $< 0.75 \epsilon_a$ (unitless) from 20 - 80
VWC:	$0.002 \text{ m}^3/\text{m}^3$ ( $0.2\% \text{ VWC}$ ) from 0 to $40\% \text{ VWC}$ , $0.001 \text{ m}^3/\text{m}^3$ ( $0.1\% \text{ VWC}$ ) $> 40\% \text{ VWC}$
EC:	$0.001 \text{ dS/m}$ from 0 to $23 \text{ dS/m}$
Temperature:	$0.1^\circ\text{C}$
<b>RANGE</b>	
$\epsilon_a$ :	1 (air) to 80 (water)
EC:	0 - $23 \text{ dS/m}$ (bulk)
Temperature:	$-40$ to $80^\circ\text{C}$
<b>MEASUREMENT SPEED</b>	150 ms (milliseconds)
<b>SENSOR TYPE</b>	
VWC:	Frequency domain
EC:	Two probe design
Temperature:	Thermistor
<b>OUTPUT</b>	Serial TTL, 3.6 Volt Levels or SDI-12
<b>OPERATING ENVIRONMENT</b>	$-40^\circ\text{C}$ to $80^\circ\text{C}$
<b>POWER</b>	3.6 - 15 VDC, 0.3 mA quiescent, 25 mA during 150 ms measurement
<b>CABLE LENGTH</b>	5 m standard, custom cable lengths available upon request
<b>SENSOR DIMENSIONS</b>	9.3 cm x 2.4 cm x 6.5 cm
<b>Part.no. ECH-GS3</b>	Decagon GS3 – Volumetric Soil Moisture, Electrical Conductivity and Soil Temperature
<b>Interface</b>	Necessary Interface to connect this sensor with iMetos: ECH870EXT / ECH871EXT / ECH874EXT or ECH870INT / ECH871INT/ ECH874INT

IM5041D

SAR19

ECH-GS1

ECH500

ECH510

ECH5TM

ECH5TE

ECH511

ECH512

MD510SM

GS3

TNS103..7

AQ600

100SMT

SEN12512

SEN13512

ECH870EXT

ECH871EXT

ECH874EXT

WM-BUS

TNS100