

QUICK START GUIDE



SOIL MOISTURE SENSORS
GS1 AND GS3

we measure the world / SOILS PRODUCTS





Read First

***This guide describes how to start using your sensor immediately.
If you read nothing else, read this guide.***



For detailed information on your sensor, download the user manual:
[DECAGON.COM/EDUCATION/MANUAL-GS-SENSORS](https://www.decagon.com/education/manual-gs-sensors)

All Decagon products have a 30-day satisfaction guarantee and a one-year warranty. Incorrect sensor installation can void your sensor warranty.

If you are using the sensors in lightning-prone areas, follow our directions for providing protection for the sensors at: **[DECAGON.COM/LIGHTNING](https://www.decagon.com/lightning)**

Pre-Installation

Before installing your sensor in the field, set up and test your system (sensors and data loggers) in your lab or office. Make sure you are using the most up to date software and firmware by checking your Decagon data logger page for updates.

1

Take some measurements with the sensor using a ProCheck. Keep in mind that sensors will not necessarily read 100% VWC in water and 0% in air. The sensors are optimized to read soils, and the factory mineral calibration is done in real soils; not air and water.

You can check sensor functionality in air and water:

Model Name	Water	Air
GS1	50-60%	Slightly Negative
GS3	~98%	Slightly Negative

Values are given in % VWC using the factory mineral soils calibration.

2

Sensors vary less than 1% from one sensor to the next. If you would like to check this for yourself, compare the output of the sensors when they are placed in ethylene glycol rather than water. Ethylene glycol has a dielectric permittivity similar to that of unsaturated soils.

3

Watch our installation video [DECAGON.COM/INSTALL](https://www.decagon.com/INSTALL) for important set-up information. Installation methods and protection measures (including using PVC pipe to protect cables where they emerge from the soil) will have a critical impact on sensor function and data quality.

Sensor Overview



Installing Sensor

The GS1 and GS3 can both be installed using the same installation method.

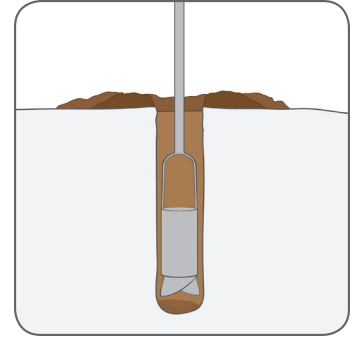
The proper technique and steps required are illustrated to the right. Please follow each step as stated to ensure accurate readings.

Please see the complete manual for more extensive set-up and installation instructions.

1

Create Hole

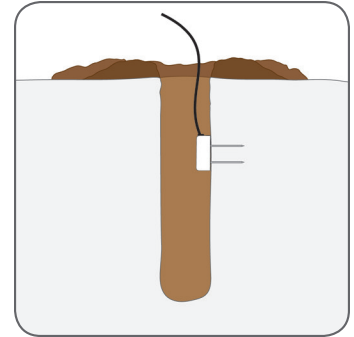
Auger or trench a hole to the desired sensor depth.



2

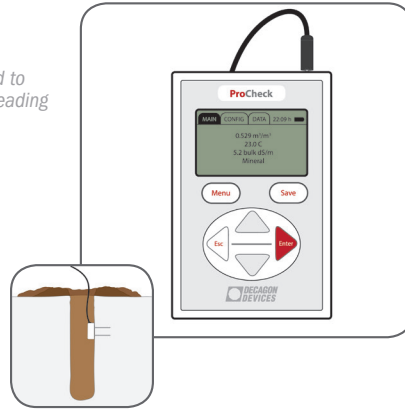
Insert Sensor

Insert the sensor into undisturbed soil vertically, or horizontally.



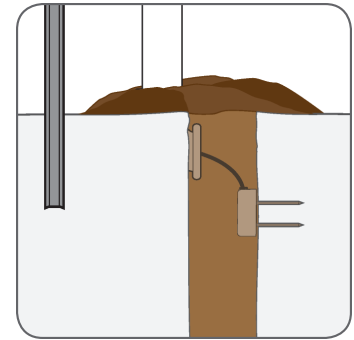
3 Check Reading Accuracy

Use the ProCheck handheld to make sure your sensor is reading accurately.



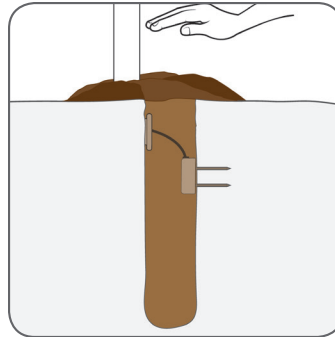
5 Secure and Protect Cables

It is important to protect your cables with PVC casing above the ground surface.



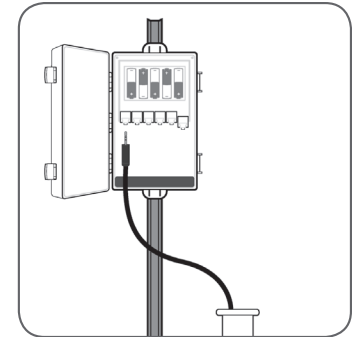
4 Backfill Hole

When backfilling the trench or hole, be sure to pack the soil to the approximate density of the surrounding soil.



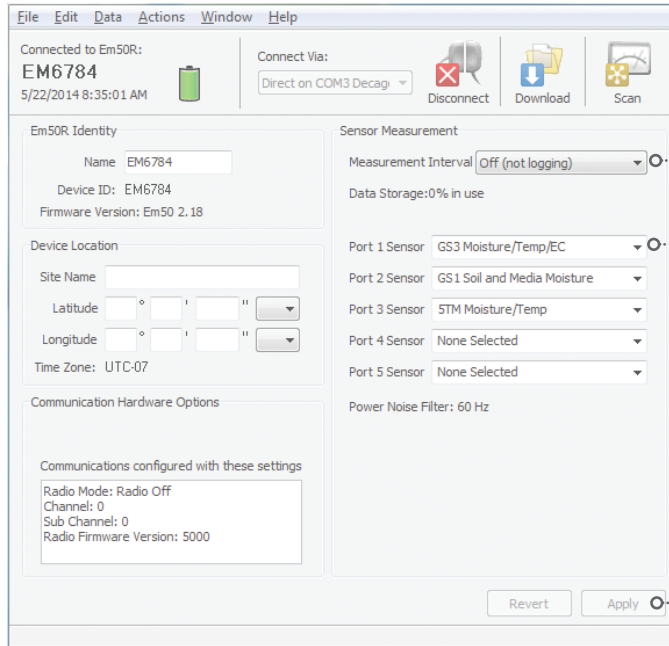
6 Plug in Sensor and Configure Logger

See next page for more details about configuring your sensor.



Logger Configuration

Configuring your logger in ECH20 Utility



1 Pick your measurement interval

2 Select the sensor plugged into each port

3 Select "Apply" to save settings

Configuring your logger in DataTrac 3

1 Select the sensor port plugged into each port

2 Pick measurement intervals by selecting "Sensors and Measurements"

The screenshot displays the DataTrac 3 software interface. A 'Configure Device' dialog box is open, showing the following configuration:

- Device:** GS3 MoistureTempEC
- Location:** (empty)
- Sensors and Measurements:**
 - Part 1: GS3
 - Part 2: STE
 - Part 3: STE
 - Part 4: HPS-2
 - Part 5: PS-1
 - Virtual Port: (empty)
- Chart Axis:**
 - Volumetric Water Content (mm)
 - Water Potential (kPa)
 - Electrical Conductivity (dS/m)
 - Temperature (°C)
 - Irrigation (minutes on)
 - Target Range: (empty)

The background shows a data plot with 'Volumetric Water Content (mm)' on the left y-axis and 'Electrical Conductivity (dS/m)' on the right y-axis. The x-axis represents time from 6/16/2012 to 6/17/2012. A 'DEKAGON' USB drive is shown in the foreground, and the software title bar reads 'DataTrac 3 SOFTWARE'.

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DECAGON.COM/DATATRAC



Soil Calibration Info

Decagon has developed factory calibrations that can be used with typical soils and some soilless substrates. These calibrations are incorporated into Decagon software. If you choose to do a custom calibration, you only need to calibrate one sensor of each type (not every individual sensor) to your specific soil.

Visit DECAGON.COM/CALIBRATE for complete instructions on how to custom calibrations for yourself.

NEED US TO CREATE A CUSTOM CALIBRATION FOR YOU?

Decagon offers a custom calibration service that will get you on your way to accurately measuring and collecting the data you need.

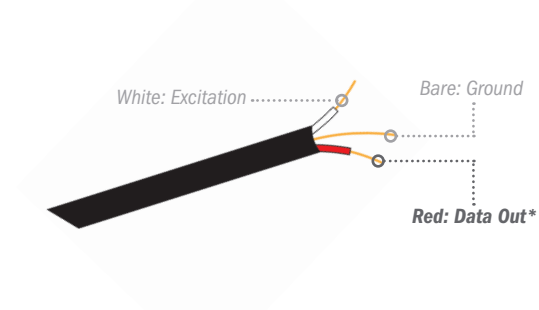


Non-Decagon Loggers

Our user manuals and integrator's guides have complete information for interfacing Decagon Sensors with non-Decagon loggers. In addition, we suggest that you use the specific logger manual during set-up.









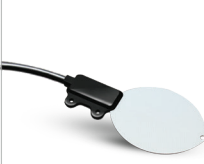











Sensor Cable 3-Wire Interface

 Please note that all Decagon sensors use the **RED WIRE** for **DATA OUT**, NOT EXCITATION



Model	Excitation	Output
GS1	3.0-15V (Absolute Max)	Analog
GS3	3.6-15V	Serial, SDI-12

Related Products

						
5TE	5TM	EC-5	10HS	MPS-2	MPS-6	
Temperature		Volumetric Water Content		Soil Matric Potential		
Electrical Conductivity				Temperature		
				Most Accurate		
						
RT-1	ES-2/ES-2F	Leaf Wetness Sensor	ECRN-50	ECRN-100	VP-3	DS-2
Rugged Temperature Sensor		Duration of Leaf Wetness	Low-Resolution Rain Gauge	High-Resolution Rain Gauge	Temperature, Relative Humidity, Vapor Pressure	Sonic Anemometer, Wind Speed, Direction
Electrical Conductivity						
						
Cup Anemometer	PYR/QSO-S	SRS	Drain Gauge	CTD Sensor	EM50 Logger Series	ProCheck
Wind Speed, Direction	Total Solar Radiation, PAR Photon Flux	Measures NDVI and PRI	Deep Drainage Monitor	Water Depth, Temperature, Electrical Conductivity	Radio, Cellular, or Direct Connect Logger	Sensor Read-Out and Storage System

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Application of Council Directive: 2004/108/EC and 2011/65/EU to which conformity is declared: EN 61326-1:2013 and EN 50581:2012

Manufacturer's Name: Decagon Devices, Inc.
Model Number: GS1, GS3
Year of First Manufacture: 2014, 2011
Type of Equipment: Soil Moisture Sensor

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