



# Soil Scout Technical Specifications

15 Dec 2022

## Technical Specifications

Specifications subject to change without notice  
For additional information, please contact the Soil Scout team at [info@soilscout.com](mailto:info@soilscout.com)

### Hydra100 Scout (Periodically Transmitting Underground Sensor Unit)

Radio power	27.0 dBm (500 mW) ERP, Bandwidth <250 kHz, duty cycle <0,001%.		
Frequency Variants	869.525 MHz (ITU-1) Europe & selected other markets 921.700 MHz (ITU-2) Americas, Australia, NZ & selected other markets 920-925 MHz (FHSS) Hong Kong, China Custom Information upon request		
Battery capacity	3000 mAh, encapsulated primary lithium		
Life expectancy	Up to 20 years @ 1 cycle per 20 minutes		
Encapsulation	Black polyurethane molding		
Dimensions (L x W x H)	129 x 59 x 25 mm (5.1" x 2.3" x 1.0")		
Sensors	Temperature 3-prong integrated Capacitive (moisture content) & Resistive (EC / salinity) DDS (Dual Depth Sensor) has same specification for both sensing heads		
Moisture Accuracy	± 2 % mean error (1 % with correct soil type, 1 % installation repeatability) Resolution 0.3 %-points (in default soil type)		
EC Accuracy	± 0.2 dS/m mean error, Typical resolution 0.1 dS/m, Range 0 to 20 dS/m		
Dielectric Accuracy	± 2 % mean error, Resolution 0.5 to 1.5 Σ, Range 1 to 135 Σ		
Temperature Accuracy	Range -40 to +80 °C / -40 to 176 °F Accuracy: +/- 0.1 °C / 0.18 °F		
Resolution	-40 to -11 °C	1.00 °C	-40 to 12 °F 1.80 °F
	-10 to +10 °C	0.25 °C	-12 to +50 °F 0.45 °F
	+10.5 to +80 °C	0.50 °C	+51 to +176 °F 0.90 °F

### Base Station 200 (Receive-only 4G Gateway)

Receiver RF sensitivity	-100 dBm, BNC connector		
Frequency Variants	869.525 MHz (ITU-1) Europe & selected other markets 921.700 MHz (ITU-2) Americas, Australia, NZ & selected other markets 920-925 MHz (FHSS) Hong Kong, China Custom Information upon request		
Operating Voltage	10-24 VDC, 500 mA In-built 2Wp solar panel and 20Wh Li-ion battery (3 days)		
Power Supply	100-240 VAC with 5 m (16'4") lead (included)		
Dimensions (L x W x H)	175 x 140 x 100 mm (6.9" x 5.5" x 3.9") <sup>1)</sup>		
Mounting	50 mm (2") pole mount / wall mount		
Data interface	4G modem with 3G/2G fallback / Custom <sup>2)</sup>		

Wide selection of Omni-directional / Directional antennas are compatible

- 1) Excluding interface ports tekstiä
- 2) SIM-card is supplied for most regions.



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## Echo Repeater 200 (Packet Repeating Transmitter)

Receiver RF sensitivity	-100 dBm, BNC connector
Frequency Variants	869.525 MHz (ITU-1) Europe & selected other markets 921.700 MHz (ITU-2) Americas, Australia, NZ & selected other markets 920-925 MHz (FHSS) Hong Kong, China Custom Information upon request
Operating Voltage	10-24 VDC, 500 mA In-built 2Wp solar panel and 20Wh Li-ion battery (10 days)
Power Supply	Mains power supply available as accessory (same as used for Base Station)
Dimensions (W x H x D)	175 x 140 x 100 mm (6.9" x 5.5" x 3.9")
Mounting	50 mm (2") pole mount / wall mount
Radio transmit power	27 dBm (500 mW) ERP, Bandwidth <250 kHz, duty cycle <0,1%
Transmit Range	10 km / 6-mile line-of-sight from Echo to Base / another Echo <sup>3)</sup>

3) Any obstacles (vegetation, hills, buildings) between the radios will decrease range. Base Stations & Repeaters dynamically daisy chain.

## Polar Night (Additional Battery Unit)

Operating Voltage	10-24 VDC, 500 mA Built-in 2Wp solar panel and 100Wh Li-ion battery
Output Voltage	7.4 VDC (nominal), 2A
Power Supply	Mains power supply available as accessory (same as used for Base Station)
Dimensions (W x H x D)	175 x 140 x 100 mm (6.9" x 5.5" x 3.9")
Mounting	50 mm (2") pole mount / wall mount
Operating time extension	With Echo: 6-8 weeks, With Base: 2-3 weeks <sup>4)</sup>

4) Freezing and hot ambient temperatures will decrease operating time.

## Soil Scout Hub (Online Monitoring and Analysis Service)

Connectivity	Web based HTTPS browser interface at <a href="https://soilscouts.fi">https://soilscouts.fi</a>
Preferred browsers	Chrome, Firefox, Safari
API	Query-type RESTful JSON API with JWT-based authentication
User Functionalities	User/Site/Preference management Hardware device management Real-time data view, History Graph view, Map view System alarms, Device grouping, Email alerts Historical data comparison tool Data download in CSV format
Server components	Google Cloud hosted Linux server in Finland Timescale database Nginx web server React frontend
Security	HTTPS protocol, user-specifically isolated data access
Backup	Obtained measurement data is never deleted Hosted server complete backup daily, stored for 30 days