

GeoCloud Wireless-Mesh Loggers

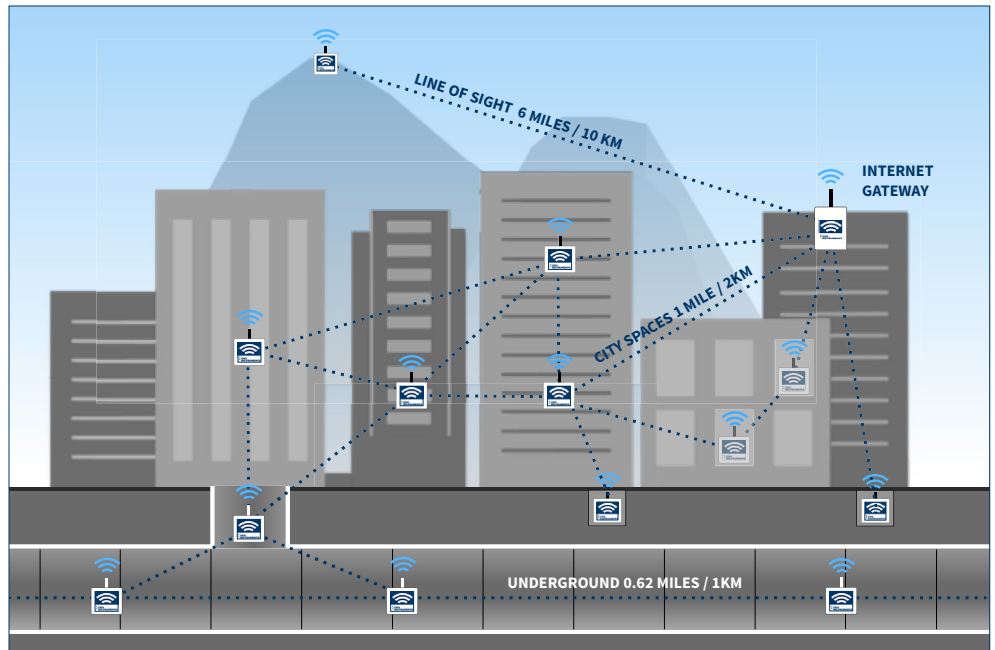
GeoCloud Wireless-Mesh Loggers combine the advantages of mesh networks with the improved signal penetration and range of 900Mhz radios.

These wireless loggers can store 65,000 readings and feature synchronized data collection and easy on-site setups.

Transmission Range

Loggers deployed underground in tunnels and manholes can transmit 3,000 feet per hop. Loggers deployed above ground in the city can transmit 1 mile per hop. Loggers with clear line of site can transmit 6 miles per hop.

The mesh network supports 8 hops from each logger to the gateway. Adding loggers strengthens the network by providing more transmission paths to the gateway.



Vibrating Wire Logger monitors piezometers, load cells, strain gauges, crackmeters, displacement sensors.



Digital SAA Logger monitors Measurand SAAV and SAAX shape arrays. **Digital 485 Logger** monitors IPIs, borehole extensometers, water level sensors.



Analog Logger monitors load cells, pressure transmitters, displacement sensors, jointmeters, rain gauges, temperature probes.



Biaxial Tiltmeter Logger has built-in tilt sensors that monitor ± 15 degrees with accuracy of 0.01°.



Repeaters can be deployed in challenging environments to add extra range and reliability.



Internet Gateway provides internet connectivity for 50 loggers via cellular 4G, Ethernet, and Wifi.

Gateway Specifications

Function: Forwards data received from wireless loggers to the internet.

Capacity: 50 loggers (nodes).

Power Supply: 12VDC @ 3A, typically external battery and solar panel.

Nominal Max/Min: 24 VDC / 11 VDC.

Power Draw: 250mA typical / 1.5A peak.

Logger Connectivity: 902-928MHz radio bands.

Internet Connectivity: Cellular 3G/4G modem, LAN, Wi-Fi.

Data Memory: 13 GB.

Shared Logger Specifications

Built-in Sensors

Barometer: 300-1100 hPa range, 0.18 Pa resolution, ± 1.7 hPa accuracy.

Humidity Sensor: 0-100% Range, 0.008% RH resolution, $\pm 1\%$ RH accuracy.

Temperature Sensor: -40°C to $+80^{\circ}\text{C}$ range, 0.01°C resolution, $\pm 1.8^{\circ}\text{C}$ accuracy.

Power

Battery Type: 3.6V D-type Li-SOCL2, user changeable.

Memory

Internal Memory: Up to 65,000 readings with time stamp.

Environmental

Operating Temp: -40°C to $+80^{\circ}\text{C}$.

Weather rating: IP67.

Transmission Range

Radio bands: 902-928MHz.

Mesh hops: Up to 8.

Line-of-sight: 6.2 miles / 10 km per hop.

Above ground: 1.2 miles / 2 km per hop.

Below ground: 3000 feet / 1 km per hop.

Typical ranges based on 30dbm (1 watt) transmission power.

Vibrating Wire Logger

Monitors: Vibrating wire piezometers, load cells, strain gauges, crackmeters, displacement sensors.

VW measurements

Excitation wave: 8V peak to peak sweep.

Measurement range: 450 - 6000Hz.

Resolution: 0.001Hz.

Accuracy: $\pm 0.04\%$ FS.

Temperature measurements

3K Thermistor: -20°C to $+80^{\circ}\text{C}$.

Resolution: 0.1°C .

Accuracy: $\pm 0.2^{\circ}\text{C}$.

Versions

1-sensor version (VW + Temp), 1 battery, 8 to 19 months battery life.

8-sensor version (VW + Temp), 2 batteries, 3 to 19 months battery life.

Tiltmeter Logger

Sensor: Built-in biaxial MEMS tiltmeter.

Range: ± 15 degrees.

Resolution: 0.0001 degree.

Accuracy: ± 0.01 degree.

Power: 1 battery, 13 to 21 months battery life.

Digital 485 Logger

Monitors: In-place inclinometers, borehole extensometers, water level sensors, water quality sensors.

Protocols: RS232 / RS485 / SDI-12.

Capacity: 1 digital device.

Digital SAA Logger

Monitors: Measurand SAAV and SAAX shape arrays.

Capacity: 1 shape array.

Battery powered: 100-segment legacy shape array, 200-segment low-power shape array.

Battery life: 24-50 months legacy arrays. 33 to 52 months low-power arrays.

Analog Logger

Monitors: load cells, pressure transmitters, displacement sensors, jointmeters, rain gauges, temperature probes.

Voltage (DC) measurements

Range: $\pm 10\text{V}$.

Resolution: 0.1mV.

Accuracy: $\pm 0.05\%$ FS.

Wheatstone Bridge Measurements

Full Bridge

Resolution: 0.1mV/V .

Accuracy: 0.25% FS.

Current Loop Measurements

Measurement range: 0-20mA.

Resolution: 0.005mA .

Accuracy: $\pm 0.05\%$ FS.

Versions

1-sensor version: 1 battery, 13 to 21 month battery life.

4-sensor version: 2 batteries: 11 to 35 month battery life.