Piconode

LS-G6-PICO-MON
WIRELESS DATA LOGGERS–EDGE DEVICES

The Piconode transforms manual and sporadic data collection to a more regular and automatic process making it the most cost-efficient way to capture data from any environment. It is capable of gathering data from different sensors and transmitting the data via long-range radio to a gateway connected to the Internet. It can also be used as a standalone logger for manual monitoring and can be easily configured and connected with a USB cable and an Android™ phone.

COMPATIBLE SENSORS:

LOAD CELLS
Used to monitor the stressing force of ground anchors, prestressing tendons and stay cables. The data gathered may be used to verify the project design, plan the maintenance or decide on the implementation of additional protective measures to ensure the stability of the site.

DISPLACEMENT SENSORS
Used to monitor cracks in structures affected by nearby excavations, expansion or contraction of joints, displacements associated with landslides and unstable slopes and projects that require measuring the vertical/lateral displacement during critical activities like lifting, lowering, sliding and underpinning.

PRESSURE TRANSMITTERS
Installed in civil works, mining or utility infrastructures to monitor water level, ground water pressure, pressure in pipes, level in a tank or silo, pressure in pot bearings, jacking operations.
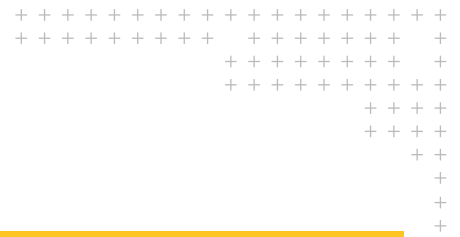
TEMPERATURE PROBES
Used to correlate all the above parameters and is also as a critical parameter in rock fall activation or for concrete maturity monitoring.

RAIN GUAGES
Used to monitor rainfall as it affects the hydrological and geotechnical conditions of the slopes and the embankments. Rainfall also affects the properties of the soil itself.

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▶ 1 channel configurable + 1 thermistor + 1 pulse counter

ANALOG INPUTS
▶ Full wheatstone bridge.
▶ Potentiometer.
▶ Ratiometric.
▶ Single-ended voltage.
▶ Pulse counter.
▶ Thermistor.

SOFTWARE
▶ User-friendly Android configuration app included.
▶ Compatible with Trimble 4D Control.
▶ Standard CSV download, FTP push and API access.

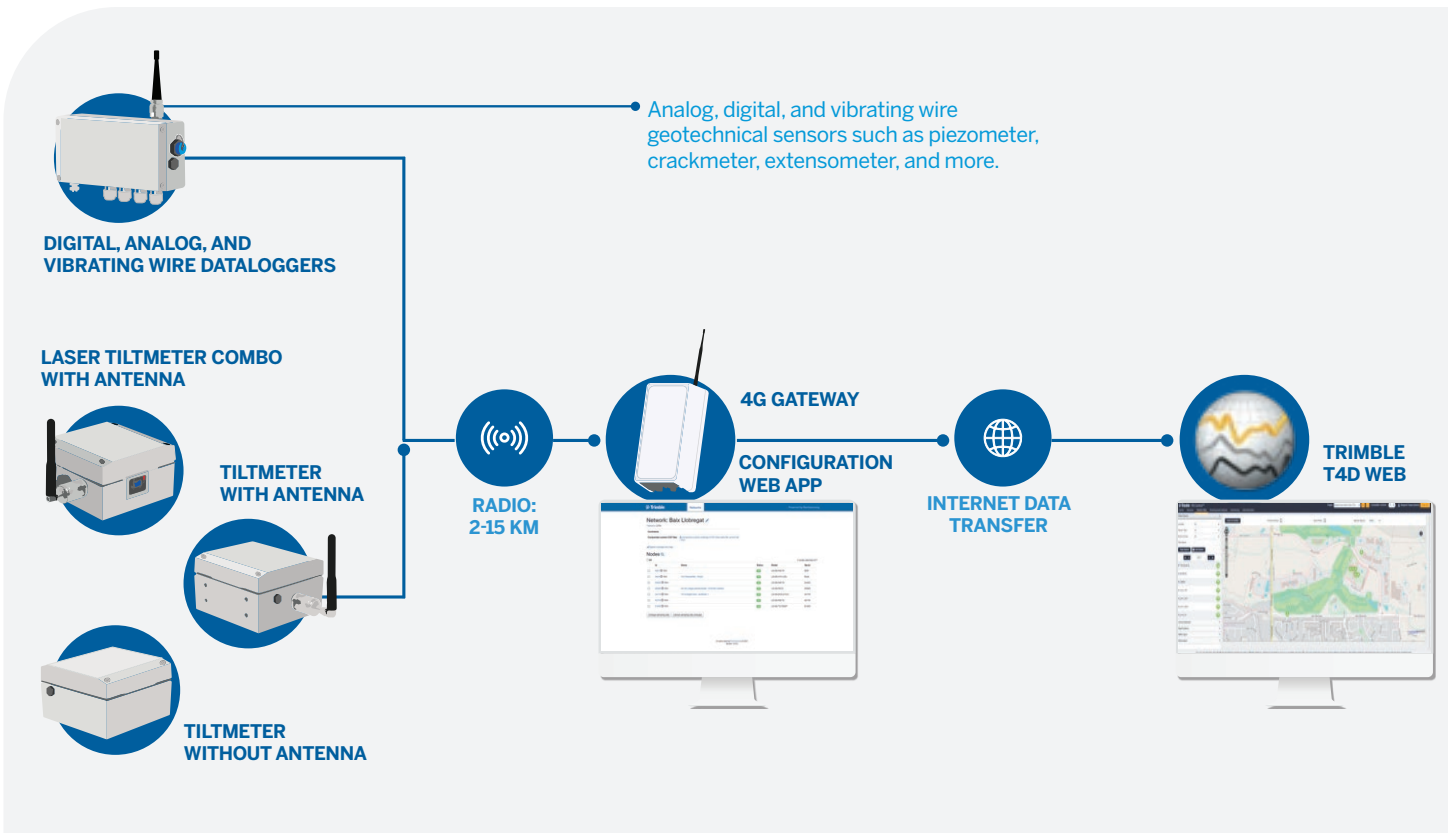Note: Specifications are subject to review and change without notice.

APPLICATIONS

▶ Ground anchors surveillance.
▶ Measurement of axial forces in struts.
▶ Load measurement in bearings and piles.
▶ Crackmeters, extensometers.
▶ Pressure: level sensors, jacking, liquid settlement systems.
▶ Displacement: deck, joints, heavy-lifting, underpinning.
▶ Water meters, rain gauges.
▶ Process measurements: pressure, temperature, displacement, weighing.

ADVANTAGES

▶ High reliability and robustness.
▶ Long-range communications (up to 10 km/6.2 miles).
▶ Low-power, long battery life (more than 5 years).
▶ Robust, small and weather-proof box.
▶ Easy configuration.
▶ Connectivity for individual sensors.

IoT-based Geotechnical Monitoring
SYSTEM INSTALLATION

Analog, digital, and vibrating wire geotechnical sensors such as piezometer, crackmeter, extensometer, and more.

DIGITAL, ANALOG, AND VIBRATING WIRE DATALOGGERS

LASER TILTMETER COMBO WITH ANTENNA

TILTMETER WITH ANTENNA

TILTMETER WITHOUT ANTENNA

RADIO: 2-15 KM

4G GATEWAY

CONFIGURATION WEB APP

INTERNET DATA TRANSFER

TRIMBLE T4D WEB

Trimble

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GENERAL			
Battery life estimation*	**1 cell**	**2 cells**	Estimations for Saft LSH 14 batteries based on the lifetime mathematical model.
sampling rate 5 min	0.9 years	1.8 years	
sampling rate 1 h	5 years	8.1 years	
sampling rate 6 h	7.3 years	>10 years	
Battery type:	2 x 3.6V C-Size (recommended Saft LSH 14).		
Sampling rate:	30 seconds to 1 day.		
Internal temperature collected and transmitted at each reading (Accuracy: 2 °C).			
Configuration software: Trimble Dlog Android App			

ANALOG INPUTS	
Voltage Excitation	5 VDC up to 50 mA.
1 channel configurable + 1 channel thermistor + 1 channel pulse counter.	
Full Wheatstone Bridge	Measuring range: ± 7.8 mV/V
	Accuracy (−40 to +80 °C): 0.13 % FS
Potentiometer / Ratiometric	Input range: 0–5 VDC (0–1 V/V)
	Accuracy (−40 to +80 °C): 0.1 % FS
Single-ended voltage	Input range: 0–5 VDC
	Accuracy (−40 to +80 °C): 0.6 % FS
Potential-free (dry contact) pulses	Pulse Count: 0 to 4 294 967 295 pulses
	Pulse Rate: 0 to 50 Hz
	Accuracy: ±1 Pulse
Thermistor	Measuring range: 0 to 2 Mohms
	Accuracy** (−40 to +80 °C): 0.04 °C (0.03 % FS)
	Accuracy*** (−40 to +80 °C): 0.9 °C (0.7 % FS)

MEMORY
Reading capacity: 200 000 readings

MECHANICAL	
Box dimensions (WxLxH):	113 x 80 x 60 mm
Overall dimensions:	120 x 80 x 60 mm
Operating temperature:	−40 °C to 80 °C (−40 °F to 175 °F)
Weather protection:	IP67
Box material:	Polycarbonate
Clamping range Ø:	3–6 mm

RADIO ISM sub 1 GHz operating frequency bands adjustable	
Range open sight.	10 km
Range city street.	2 km
Range manhole in a city street:	1 km
Tunnel	2 km
Bidirectional communications: Remote sampling rate change / Clock synchronization.	
Maximum link budget: 151 dB / 157 dB.	
Configuration: Star (no repeaters needed).	

Note: Specifications are subject to review and change without notice

* Considering 300 Ω strain gauge bridge + 3 kΩ thermistor and Barcelona temperature profile. Typical Europe radio configuration. Spreading factor 9, radio transmit power 14dBm.
Consumption varies depending on the sensor used, sampling rate and environmental and wireless network conditions.
** Thermistor (3 KOhms@25°C). Does not include thermistor probe error.
*** Thermistor (50 KOhms@25°C). Does not include thermistor probe error.

TRANSFORMING THE WAY THE WORLD WORKS

Trimble