EDGE DEVICES - WIRELESS DATA LOGGERS

Piconode

LS-G6-PICO

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 ANALOG OUTPUT 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.

THERMISTOR SENSORS

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.

PULSE COUNTER SENSORS

Rain Gauges and Flow Meters

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.

FEATURES

1 configurable analog channel + 1 thermistor + 1 pulse counter
CONFIGURABLE ANALOG INPUTS
Full wheatstone bridge
Potentiometer
Ratiometric
Single-ended voltage
Pulse counter (dry contact and open collector pulse)
Thermistor
SOFTWARE
User-friendly Android configuration app included.
Web browser software (CMT Edge and CMT Cloud).
Standard CSV download, FTP push and API access.

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.

Technical Specifications

GENERAL	
Channels	3 channels
Battery type	2 x 3.6V C-Size (recommended Saft LSH 14).
Sampling rate[2]	Selectable from: 30 s, 1, 2, 5, 10, 15, 30 min, 1, 2, 4, 6, 12, 24 h
Additional features	Internal temperature collected and transmitted at each reading (accuracy: 2 °C).
Configuration software	Worlsensing App (Android)
CHANNEL 1: CONFIGURABLE	
Input type	Selectable from full wheatstone bridge, potentiometer or single-ended voltage
Voltage Excitation	0-5 VDC up to 50 mA.
FULL WHEATSTONE BRIDGE	
Measuring range	± 7.8 mV/V
Accuracy	0.13 % FS
POTENTIOMETER/ RATIOMETRIC	
Input range	0-5 VDC (0-1 V/V)
Accuracy	0.1 % FS
SINGLE-ENDED VOLTAGE	
Input range	0-5 VDC
Accuracy	0.6 % FS
CHANNEL 2: THERMISTOR	
Input type	Thermistor
Measuring range:	0 to 2 MΩ
Accuracy[2]	0.04 °C (0.03 % FS) for 3K Ω at 25° C 0.9 °C (0.7 % FS) for 50K Ω at 25° C
CHANNEL 3: PULSE COUNTER	
Input type	Potential free (dry contact) and open collector pulses
Pulse Count	0 to 4 294 967 295 pulses
Pulse Rate	0 to 50 Hz
Accuracy	±1 Pulse

MEMORY	
Reading capacity	200 000 readings
MECHANICAL	
Box dimensions (WxLxH)	113x80x60 mm
Overall dimensions	120x80x60 mm
Weight (excluding batteries)	240g
Operating temperature	-40° C to 80° C (-40° F to 175° F)
Weather protection	IP68 (at 1.2 m for 2 hours)
Box material	Polycarbonate
Clamping range Ø	4.5 - 10 mm

RADIO - ISM sub 1 GHz operating frequency bands adjustable	
Range open sight	10 km
Range city street	2 km
Tunnel	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)

[2] Does not include thermistor probe error.

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Singapore
Poland

BATTERY LIFE ESTIMATION [1]

Sampling Rate	1 cell	2 cells	Estimations for Saft LSH 14 batteries based on the lifetime mathematical model
5 min	0.9 year	1.8 years	
1 h	5 years	8.1 years	
6 h	7.3 years	>10 years	

[1] 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.