loadsensing

WORLDSENSING

WIRELESS MONITORING SYSTEM

Piconode

LS-G6-PICO / 1 TH + 1 PULSE + 1 CH ANALOG NODE

Load, displacement, pressure and temperature are critical parameters in many construction and mining projects.

Load cells are frequently used to monitor the stressing force of ground anchors, prestressing tendons and stay cables. The data gathered from the monitoring of the load cells can 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 are 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 are 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 measurement is required to correlate all the above parameters and is also as a critical parameter in rock fall activation or for concrete maturity monitoring.

The Loadsensing Piconode easily connects load cells, displacement sensors, pressure transmitters and temperature probes to the internet. 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.

The Piconode is capable of gathering data from different sensors and transmitting the data via long-range radio to a gateway connected to the Internet. One gateway can support hundreds of nodes in the same network.

The Piconode 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.

FEATURES	APPLICATIONS
1 channel configurable + 1 thermistor + 1 pulse counter	Ground anchors surveillance
ANALOG INPUTS	Measurement of axial forces in struts
Full Wheatstone Bridge	Load measurement in bearings and piles
Potentiometer	Crackmeters, extensometers
Ratiometric	Displacement: Deck, joints, heavy-lifting, underpinning
Single-ended voltage	Pressure: Level sensors, jacking, liquid settlement systems
Pulse counter	Water meters, rain gauges
Thermistor	Process measurements: Pressure, temperature, displacement, weighing
SOFTWARE	**ADVANTAGES**
User-friendly Android configuration app included	High reliability and robustness
Web browser software	Long-range communications (up to 10 km/6.2 miles)
Standard CSV download, FTP push and API access	Low-power, long battery life (over 5 years)
	Robust, small and weather-proof box
	Easy configuration
	Connectivity for individual sensors

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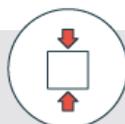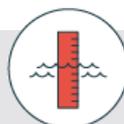
SPECIFICATIONS

GENERAL

Battery life estimation	1 cell	2 cells	Estimations for Saft LSH 14 batteries based on the lifetime mathematical model
sampling rate 5 min	1 year	2 years	
sampling rate 1 h	5.1 years	10 years	
sampling rate 6 h	6.9 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	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)

* Thermistor (3 KOhms@25°C). Does not include thermistor probe error.

** Thermistor (50 KOhms@25°C). Does not include thermistor probe error.

MEMORY

Reading capacity	200,000 readings

MECHANICAL

Box dimensions (WxLxH)	113x80x60 mm
Overall dimensions	120x80x60 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
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)