loadsensing
BY WORLDSENSING

Geomotion
AUSTRALIA

PICONODE
(LS-G6-PICO)

Product Overview

The Loadsensing 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 GAUGES

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 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
Web browser software
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

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	0.9 year	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	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)	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)

* 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.