

EDGE DEVICES – WIRELESS DATA LOGGERS

Piconode

LS-G6-PICO

Worldsensing's Piconode is a 3-channel wireless data logger. It counts with a configurable channel that admits most inputs from analog sensors, a thermistor channel and a pulse counter channel. Its compact design makes it the most cost-effective way to capture data from any environment. You can now easily connect any voltage, current, resistive, transducer such as load cells, strain gauges, pressure cells, pressure sensors, thermometers, flow sensors to your monitoring systems.

The Piconode data logger is capable of transmitting data via long range radio to a gateway connected to the Internet up to 10 km/ 6.2 miles away. One gateway can also support dozens of data



loggers in the same network, depending on the reporting period, through a star or tree network topology.

In terms of energy consumption, Worldsensing data loggers are autonomous battery-powered devices with C-size batteries that can last up to 17 years with minimal to zero maintenance required. The analog data logger is IP68 certified and tested from -40C to +80 °C.

The Piconode can also be used as a standalone logger for manual monitoring and can be easily configured through the Worldsensing App.

FEATURES

1 configurable analog channel + 1 thermistor+ 1 pulse counter

Input types for configurable channel:

- Full Weathstone bridge
- Ratiometric and potentiometers
- Single-ended voltage

Robust, small and IP68 grade weather-proof box.

Long battery life (>17 years @1h sampling rate).

Internal temperature collected and transmitted at each reading (accuracy: 2 °C).

Long range communications through LoRa communications.

SOFTWARE

User-friendly Android configuration app included.

Web browser software for network, device and data management.

Data processing with formulas to convert raw readings into engineering unit values.

Single-gateway network setup with GMT Edge software (data server and radio server hosted in the gateway and data access through standard CSV downloads. FTP push. Modbus TCP. API REST and MQTT¹).

Multi-gateway network setup with GMT Cloud software and advanced features with data access via standard CSV downloads. FTP push. API REST and MQTT push¹.

APPLICATIONS

STRUCTURAL AND GEOTECHNICAL MONITORING

- Ground anchors surveillance.
- Measurement of axial forces in struts.
- Load measurement in bearings and piles.
- Crackmeters, single point extensometers and utility monitoring points.
- Displacement in deck, joints, heavy-lifting, underpinning.
- Pressure: level sensors, jacking.

PROCESS MONITORING

Process measurements: pressure, temperature, displacement, weighing.

ENVIRONMENTAL MONITORING

Water monitoring: water meter, rain gauges.

ADVANTAGES

Allows you to wirelessly connect to a wide catalog of industrial and geotechnical sensors with analog interface

Suitable for unattended, large scale projects

Very low maintenance equipment due to its robustness and low power consumption

Cost-effective solution for wireless data collection.

Easy configuration through the Worldsensing mobile application

Customer support from a expert team of geotechnical monitoring

Pioneer company in the field, long history in monitoring large-scale civil infrastructure

¹ MQTT available upon request

TECHNICAL SPECIFICATIONS

GENERAL

Channels	3 channels
Input types	Channel 1: Configurable Channel 2: Thermistor Channel 3: Pulse Counter
Reporting Period	Selectable from: 30 s, 1, 2, 5, 10, 15, 30 min, 1, 2, 4, 6, 12, 24 h
Time synchronization discipline by radio	Better than ± 30 seconds
Battery type	2×3.6 V C-size user-replaceable, high energy density batteries
Interfaces	Internal mini USB
Power Output per channel	5 Vdc (up to 50 mA)
Warmup time	Configurable (60 s MAX)
Device configuration	Worldsensing App
App advanced functionalities	- Field sample collection and signal coverage testing when the sensor is connected to the app. - Wiring recommendations to assist on site sensor installation.
Sensor-specific App functionalities	Warmup time configuration (ms or s). Output power options.

CHANNEL 1: CONFIGURABLE

Input type	Selectable from full Wheatstone bridge, potentiometer or single-ended voltage
Voltage Excitation	0–5 voe up to 50 mA.

FULL WHEATSTONE BRIDGE

Measuring range	± 7.8 mV/V
Accuracy	0.13% FS for –40° to 80 °C 0.014% FS for –10° to 50 °C

RATIOMETRIC AND POTENTIOMETER SIGNALS

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 3 K Ω at 25 °C 0.9 °C (0.7% FS) for 50 K Ω at 25 °C

CHANNEL 3: PULSE COUNTER³

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

MECHANICAL

Box dimensions (WxLxH)	113×80×60 mm (4.45×3.15×2.36")
Overall dimensions	120×80×60 mm (4.72×3.15×2.36")
Weight (excluding batteries)	240 g (0.53 lb)
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 (0.177–0.393")

MEMORY

Memory Structure	Circular Buffer
Maximum Memory Records	200 000 readings

² Does not include thermistor probe error.

³ In rare occasions for dewatering-related projects, when the pulse signal is noisy, resets of the pulse counter linked to a specific loss of node time have been reported. In such situations, it may be necessary to install a signal isolator between the flow meter and the node. For any clarification, please contact Worldsensing.



RADIO SPECIFICATIONS	
Radio band	ISM sub1GHz
Operating frequency bands	Adjustable
Bidirectional communications	Remote sampling rate change/ clock synchronization
Maximum link budget	151 dB/ 157 dB
Radio configuration	LoRa/ LoRaWAN
RADIO RANGE ⁴	
Range open sight	10 km (6.21 miles)
Range city street	2 km (1.24 miles)
Range manhole in a city street	1 km (0.62 miles)
Tunnel	2 km (1.24 miles)

BATTERY LIFE ESTIMATIONS ⁵			
PICONODE EQUIPPED WITH 1 BATTERY			
Battery Model		LSH14	LM26500
Sampling Rate	5 min	1 year	1.3 years
	1 h	5.6 years	8.6 years
	6 h	8.1 years	15.4 years
PICONODE EQUIPPED WITH 2 BATTERIES			
Battery Model		LSH14	LM26500
Sampling Rate	5 min	2 years	2.6 years
	1 h	9 years	17.2 years
	6 h	11.7 years	>25 years

ACCESSORIES ⁶	
WS-ACC-POLE-PL8	Aluminum plate for pole mounting. Works with both U-bolts of 35 mm or 50 mm.
WS-ACC-U35	U-bolts and nuts for a pole diameter less than 35 mm. To use with WS-ACC-POLE-PL8.
WS-ACC-U50	U-bolts and nuts for a pole diameter less than 50 mm. To use with WS-ACC-POLE-PL8.
LS-ACC-MP-P	Wall brackets (4 polycarbonate wall brackets and 4 screws)
LS-ACC-CELL-1C	Saft LSH 14 C-size spiral cell 5.8 Ah.
WS-ACC-CELL2-1C	Saft LM26500 C-size spiral cell 7.4 Ah.
LS-ACC-MUSB-C	Data logger – mobile cable. USB-C to mini USB cable, 1 m.

⁴ The distances have been tested by Worldsensing and have been accomplished in actual projects using the standard antenna. However, radio range depends on the environment so these distances are only indicative. Consult with us for your application.

⁵ Battery life estimations based on the lifetime mathematical model using Barcelona weather profile. Considering 300 0 strain gauge bridge+ 3 kΩ thermistor. Typical Europe radio configuration. Spreading factor 9, radio transmit power 14 dBm. Consumption varies depending on the sensor used, sampling rate and environmental and wireless network conditions.

⁶ Other mounting brackets and accessories including sealing inserts to lead 2 cables through one cable gland are available upon request.

FOR MORE INFORMATION

Scan to access the user guide for this device.



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