Wireless Transceiver Node General Specificaitons

Wireless Sensor Node General Specifications

Data Sheet Leap Sensors® General Transceiver Node Specifications

Applications

- Nodes are configured for one or multiple sensor inputs.
- *See website for application-specific details.*
- Ideal for in-process monitoring, predictive maintenance, equipment monitoring, general plant health monitoring, and multi-sensor interfacing.
- Sensor inputs include any analog (0-5 V, 0-10 V, 0-12.5 V, 4-20 mA, amplified mV/V or Digital (I2C, Modbus RTU RS485, CAN, Switch) sensor signals. Plus, two thermocouple inputs.
- Multiple sensors of different types available including the Leap Sensors® Motor Monitor, the Leap Sensors® Vibration Monitor, and the Leap Sensors® Dual-Input Thermocouple.

Special Features

- Transmission range of 1500 ft (500 m) in open air. 500 ft (150 m) in a typical industrial environment. Range extenders increase the sensor to gateway distance.
- Typical battery life of 5+ years when transmitting every 15 minutes.
- Nodes are configurable to provide power to most standard industrial sensors.
- Battery powered or option for external 5VDC input.
- Edge computing gives small, actionable data.
- Sample and transmit intervals can be configured over the air, via the Leap software, to meet specific application requirements.
- Preconfigured, prior to shipping, to pair with new or existing gateway for simple installation – up and running in 5 minutes.
- LED indicators for power, network connection, gateway connection, and database connection status.

Description & Product Highlights

The Leap Sensors® wireless sensor system greatly reduces installation costs and the complexity pulling wire to connect sensors with monitoring software. In addition, edge computing creates easily transmissible, small, actionable data to trigger alerts.

Use the Leap Sensor Manager software to monitor machines and send alerts. Or, pass data to existing plant monitoring software with the Modbus, DNP3, or standard web-API interfaces.

Interfacing with most industrial sensors is quick and simple with 12 or 24VDC sensor excitation (from the node battery).

The Leap Sensors® system is intended primarily for the purpose of performing industrial sensor measurements.

Transceiver Node

Modularity and Customizability
Each Multi-Sensor Transceiver Node has the capability to support and interface simultaneously with up to four analog voltage sensors, two thermocouples, a mV/V output sensor (strain bridge, load cell, potentiometer, RTD), a digital switching input, and digital busses (I2C CAN, Modbus RTUS RS485). This makes the Multi-Sensor Transceiver Node ideal for all remote sensing applications and semi-custom applications. Interfacing multiple sensors to one transceiver node provides a substantially lower price compared to individual sensing devices.

Ease of Implementation
All Leap Sensors transceiver nodes come preconfigured and securely paired with selected Leap Sensors gateways for quick and simple integration into an existing Leap Sensors system. Custom firmware loaded on new sensor nodes automatically configures the Leap software to accept new types of sensor data.

Real-time Data Viewing and Alerts
All Leap Sensors transceiver nodes stream data to gateways at configurable intervals. This data is accessible and viewable in real time. In addition to real-time viewing and graphing of sensor data, alerts based on any sensor condition are configurable, and can be sent via phone call, email, or text for instant communication of a sensor reaching an alert condition.

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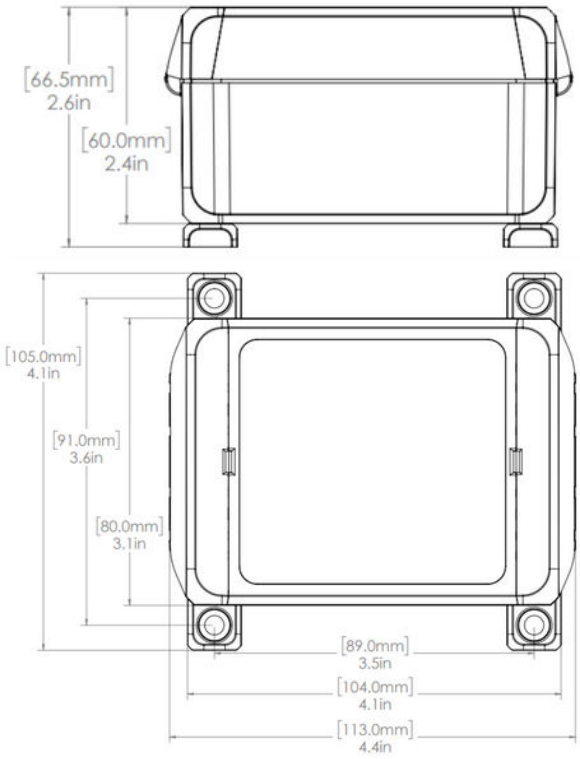
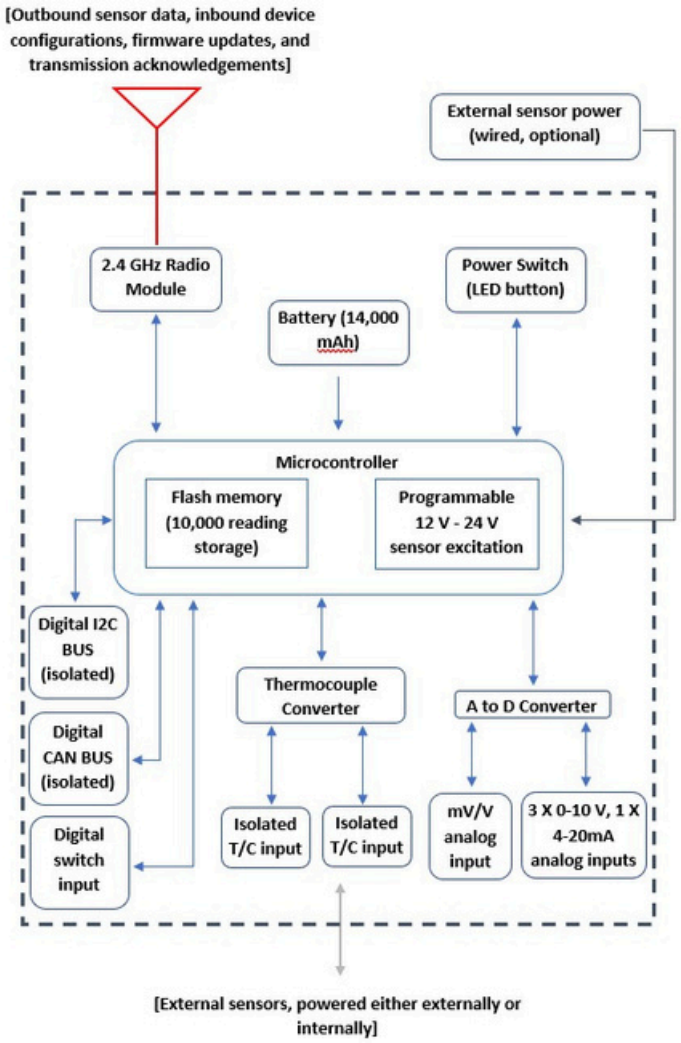
Smart in sensing

Leap Sensors® Multi-Sensor Node Specifications		
General Sensor Specifications		
Analog Input Signals	**Isolated 24-Bit ADC:** 2 x 0-10 V 1 x 0-12.5 V 2 x 4-20mA 1x Amplified mV/V (strain, load cell)	**Thermocouple:** 2 x Isolated Thermocouples
Digital Input Signals	1 x Isolated I2C BUS or RS485 - Modbus RTU 1 x Isolated CAN Bus	1 x Digital Input (3.3V to 24V)
Programmable Sensor Excitation	12 V @ 80 mA max, 24 V @ 25 mA max – turned on only immediately prior to reading sensor	
Sensor Interface	Preconfigured IP67 2-6 pin M8, 8 pin M12, cable gland, two female thermocouple connectors*	
Output units	User and factory configurable through Leap Sensor Manager software.	
Integrated and Isolated Thermocouple Sensing (Cold Junction Compensation)		
Specifications	+-0.0625 °C resolution, open and short circuit detection	
Compatible Thermocouple Types	K, J, T, N, S, E, B, R	
Electonic Circuit Thermocouple Accuracy	Typical: +/- 2C from -150C to 200C Typical: +/- 1% of full scale from 200C to 1300C. Overall accuracy if a combination of the electronic and the thermocouple used and the accuracy of the cold junction compensation. Consult the data sheet for the specific thermocouple to determine the full system accuracy. Thermocouples are not typically used for high accuracy temperature measurements.	
Temperature Reading Range	Electronics reads from K-Type: -150C to 1300C S-Type: -10C to 1600C B-Type: -300 to 1800C Other types – contact us	
Thermocouple Connection	Pigtail cable with standard female miniature flat pin connectors. The enclosure IP67 rating may be reduced if the thermocouple “pigtail” cable has a braided jacket	
Power Specifications		
Battery Power	3.6 V, 14,000 mAh D-cell, Lithium Thionyl Chloride	
Battery Life	Typically 5+ years at 10 minute transmit & sample intervals. On-board patented battery passivation prevention circuit assures long life. Battery life estimations on specific nodes and applications are available upon request.	
Power / Current Consumption	Low sleep current assures long life	
Wireless Specifications		
Wireless Transmission Range	Industrial Environments**	Open-Air**
	500 ft	1500 ft
Range Extenders	Range extenders available to extend transmission distance	
RF Transmission Power	User configurable 0-20 dBm, factory configured to 20 dBm***	
RF Communication Protocol	1) Internet Protocol based Thread, IPV6LoWPAN, 802.15.4 2) Direct-to-cellular network (Verizon standard) LTE-M/NB-IoT	
RF Frequency and Modulation	1) 2.4 GHz (16 Channels), DSSS provides higher noise and interference resistance 2) Direct-to-cellular network (Verizon standard) LTE-M/NB-IoT	
Data Interfaces to Other Software	Modbus, DNP3, standard web API	
Data Security	AES 128-bit encryption with secure join and key exchange (J-PAKE)	





Other Features	
Node Operating Temperature	-40 to 60C standard -40 to 80C available - special order
Gateway Compatibility	Compatible with all Leap Sensors® wireless gateways
Firmware	Over-the-air upgradeable via softwware interface
Certifications	FCC (USA), IC (Canada)
Gateway Communication	Send and receive (data, acknowledgements, updates, and device configuration). Data stored in sensor node and gateway until confirmed write to database.
LED Power Switch	Recessed in the enclosure to prevent accidental power cycling. On-switch is recessed. Off-switch flush with surface. Immediately resets transceiver node when turned off. Integrated green and red LED indicate wireless connection status at power-up.
Node Internal Memory	Time-stamped device readings stored on transceiver node if gateway does not acknowledge writing data to database.

Enclosure & Hardware Specifications	
Dimensions	113 mm x 80 mm x 60 mm
Weight	355g typical for complete transceiver node
Material	Polycarbonate (UL-94)
Mounting Options	Optional feet (shown in drawing) can be mounted horizontally or vertically. Screws can also be passed through the enclosure (when the lid is open) for mounting without feet.
Ingress Protection	IP68 enclosure. IP67 glands, cables, switch
Node Antenna	Internal antenna (typical). External antenna (optional).

** Panel connections are customizable, consult factory for complete options.*
*** Transmission ranges vary with environmental conditions. Reported values are test averages.*
**** Transmission power requirements are governed regionally.*