

Applications

- Wireless transmission of any mV/V signal from strain sensors, and any strain gauge based transducer.
- Structural health monitoring – attaches to a wide range of strain sensors including spot-weld-on type.
- Measuring loads with standard load cells.

Special Features

- Configure strain sensors and load cells over-the-air with software to zero-offset, calibrate, and convert unit of measure.
- Option to daisy-chain up to 8 strain modules (each supporting 2 full-bridge strain sensors) to industrial CAN bus circuit on the transceiver node.
- On-board precision reference voltage, amplifier, and 24-bit A/D converter for precision readings.
- Strain sensors and load cells are powered by the transceiver node.
- Supports full, half, and quarter bridge strain circuits and different gage factors – every type of resistive strain or load cell.
- Transmission range of 1,500 ft. in open air
- Configurable sample and transmit intervals to fit many application requirements, high speed sampling available.
- Wireless bulk data download available.
- Simple integration into existing Leap Sensors system
- Preconfigured 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 statuses
- Optional strain tester module

Description & Product Highlights

Phase IV's Leap Sensors strain and load cell transceiver node interfaces with every type of resistive strain sensor and load cell.

The Leap Sensors wireless sensor system greatly reduces the cost and complexity of laying cables between sensors and data acquisition units. Strain sensor amplification and A/D is done right at the strain sensor for high accuracy.

Interfacing with any existing sensor is quick and simple with programmable sensor excitation and user configurable sensor calibration fields.

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



Strain Gauge and Load Cell Transceiver Node

Modularity and customizability

Each Strain and Load Cell Transceiver Node has the capability to connect to one strain/load connection or up to 16 strain or load cells using the CAN bus. This makes the Multi-Sensor Transceiver Node ideal for all remote sensing applications and semi-custom applications. Other type of sensor may also be connected to the strain transceiver node. Interfacing multiple sensors to one transceiver node provides a substantial ROI compared to individual sensing devices.

Ease of implementation

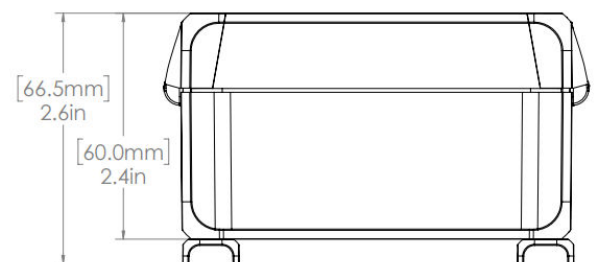
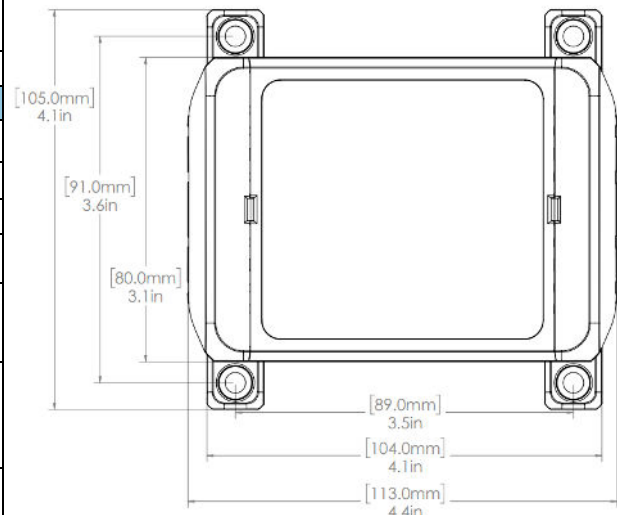
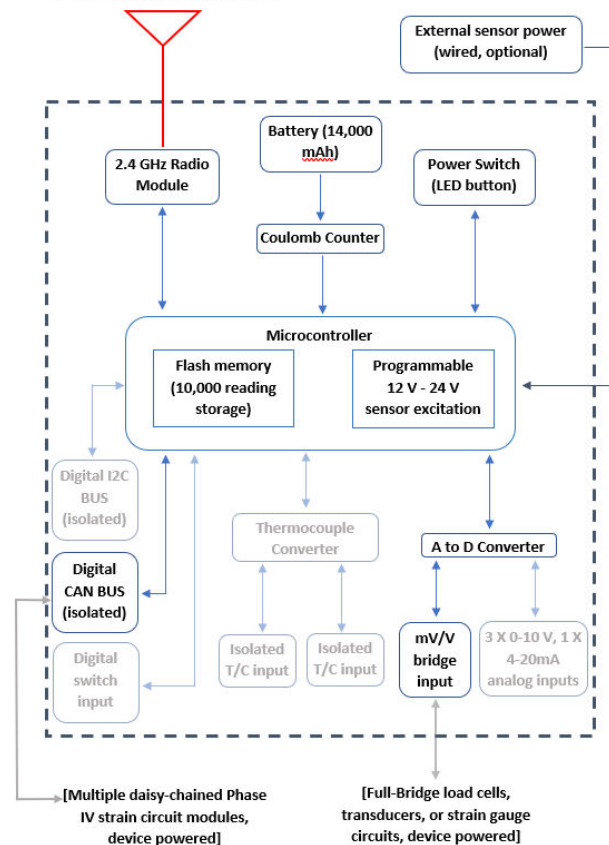
All Leap Sensors transceiver nodes come pre-configured and paired with selected Leap Sensors gateways for quick and simple integration into an existing Leap Sensors system, or to function as a new stand-alone system. Custom firmware loaded on the device can configure the data viewing software to accept any and all new device types.

Real-time data viewing and alerts

All Leap Sensors transceiver nodes stream data to Leap Sensors gateways at configurable intervals. This data is accessible and viewable in real time. In addition to real-time viewing and graphing of sensor parameters, 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.

Leap Sensors® Strain & Load Gauge Transceiver Node Specifications		
General Sensor Specifications		
Strain and Load Cell Input Signals	Amplified mV/V (strain, load cell) Typical range +/- 2000 uS	1000 ohm and 330 ohm
	1000, 350, or 120 ohm	Typical sensitivity: 1.0 to 2.0
Sensor Excitation	2.8VDC from the transceiver node	
Sensor Interface	Pre-configured IP67 M8 panel connector or Cable gland with wires terminating to a terminal block inside	
Strain Configuration	Bridge sensitivity, offset, and unit conversion done over-the-air with user software	
Strain Circuit Test	Optional field test module simulates +/- 1000 uS and +/- 500 uS to verify proper circuit operation	
Output units	User and factory configurable through Leap Sensor Manager software.	
Power Specifications		
Battery Power	3.6 V, 14,000 mAh D-cell, Lithium Thionyl Chloride	
Battery Life	Approximately 8-10 years at 10 minute transmit & sample intervals. On-board battery passivation prevention circuit assures long life.	
Power / Current Consumption	Typical Operating Current: 6mA - 30mA (depending on sensors) Typical Transmit Current: 9mA @ 0dBm and 80mA @ 20 dBm RX Current: 11 mA	
Wireless Specifications		
Wireless Transmission Range	Industrial Environments**	Open-Air**
	500 ft	1,500 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	Internet Protocol based Thread, IPV6LoWPAN, IEEE 802.15.4	
RF Frequency and Modulation	2.4 GHz (16 Channels), DSSS provides higher noise and interference resistance	
Data Security	AES 128-bit encryption with secure join and key exchange (J-PAKE)	
Other Features		
Operating Temp.	- 40°C to 60°C, -40°C to 120°C available – special order	
Gateway Compatibility	Compatible with all Leap Sensors® wireless gateways	
Firmware	Over-the-air upgradeable via web interface	
Certifications	FCC (USA), IC (Canada)	
Gateway Communication	Send and receive (data, acknowledgements, updates, and device configuration). Data stored in 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	110,000 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 and 120C rated)	
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)	

[Outbound sensor data, inbound device configurations, firmware updates, and transmission acknowledgements]



* 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.