

IEPE-Link™-LXRS®

Wireless IEPE Sensor Node



IEPE-Link™-LXRS® - specialized high-speed node designed for synchronized, periodic burst sampling of piezoelectric devices

LORD MicroStrain® LXRS® Wireless Sensor Networks enable simultaneous, high-speed sensing and data aggregation from scalable sensor networks. Our wireless sensing systems are ideal for sensor monitoring, data acquisition, performance analysis, and sensing response applications.

The **gateways** are the heart of the LORD MicroStrain wireless sensing system. They coordinate and maintain wireless transmissions across a network of distributed wireless sensor **nodes**. The LORD MicroStrain LXRS wireless communication protocol between LXRS nodes and gateways enable high-speed sampling, ± 32 microseconds node-to-node synchronization, and lossless data throughput under most operating conditions.

Users can easily program nodes for data logging, continuous, and periodic burst sampling with the **Node Commander®** software. The web-based **SensorCloud™** interface optimizes data aggregation, analysis, presentation, and alerts for gigabytes of sensor data from remote networks.

Product Highlights

- Designed for high speed, high resolution periodic burst sampling of Integral Electronic Piezoelectric (IEPE) and Integrated Circuit Piezoelectric (ICP®) accelerometers
- Ideal for vibration sensing in challenging applications, such as critical structure and machine health monitoring
- High resolution data with 24-bit A/D converter
- User-programmable 1 KHz to 104 KHz sample rates
- 109.5 dB dynamic range
- User-selectable low pass filtering

Features and Benefits

High Performance

- Lossless data throughput and node-to-node sampling synchronization of $\pm 32 \mu\text{s}$ in LXRS-enabled modes
- Wireless range up to 2 km (800 m typical)

Ease of Use

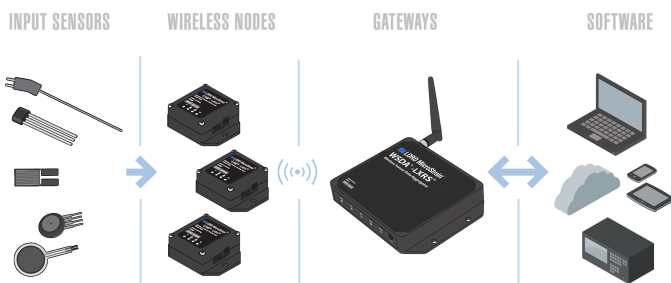
- High capacity, rechargeable battery for extended use
- Remotely configure nodes, acquire and view sensor data with Node Commander®.
- Optional web-based SensorCloud™ interface optimizes data storage, viewing, alerts, and analysis.
- Accepts most IEPE accelerometers

Cost Effective

- Out-of-the box wireless sensing solution reduces development and deployment time.
- Volume discounts

Applications

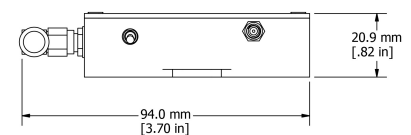
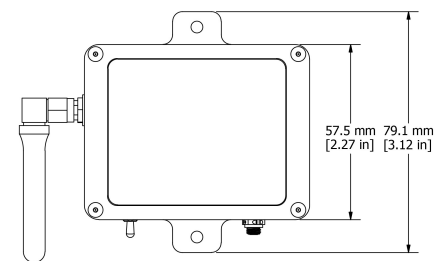
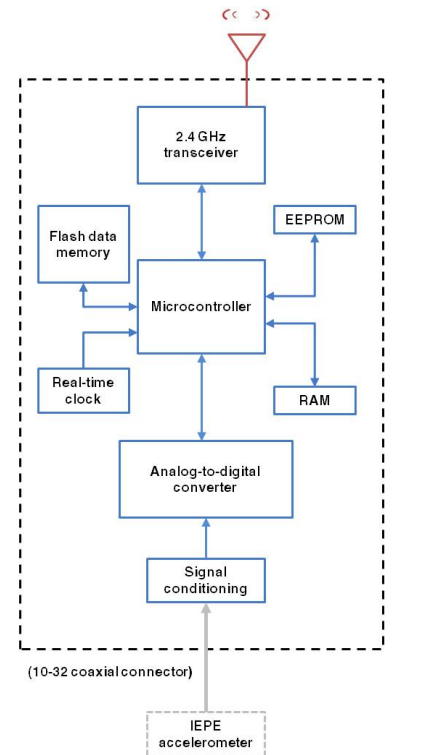
- Condition-based monitoring
- Health monitoring of rotating components, bearings, aircraft, structures, and vehicles
- Modal analysis
- Vibration monitoring
- Product testing



Wireless Simplicity, Hardwired Reliability™

Specifications

General	
Sensor input channels	IEPE transducer, 1 channel
Resolution	24-bit resolution
Dynamic range	109.5 dB dynamic range
Anti-aliasing filter bandwidth	5th order low-pass Butterworth filter with programmable cutoff frequencies from 26 Hz to 33 KHz
Digital finite impulse response (FIR) filter	100 dB in frequency band from 1/2 to 8 times the sample rate
IEPE Transducer Requirements	
Excitation voltage	23 V dc
Excitation current	2.3 mA
Output voltage	± 5 V dc (on 7 to 12 V dc bias)
Sampling	
Sampling modes	Synchronized (periodic burst sampling only)
Sampling rates	Periodic burst sampling: 1 kHz to 104 kHz
Maximum burst periods	150 seconds @ 1 kHz; 3 seconds @ 50 kHz; 1.3 seconds @ 104 kHz
Measurable signal bandwidth	1 Hz to 33 kHz
Sample rate stability	±3 ppm
Network capacity	Up to 125 nodes per RF channel (and per gateway) depending on the number of active channels and sampling settings. Refer to the system bandwidth calculator: http://www.microstrain.com/configure-your-system
Synchronization between nodes	± 32 µsec with 10 sec beacon interval (synchronized mode)
Operating Parameters	
Wireless communication range	Outdoor/line-of-sight: 2 km (ideal)*, 800 m (typical)** Indoor/obstructions: 50 m (typical)**
Radio frequency (RF) transceiver carrier	2.405 to 2.470 GHz direct sequence spread spectrum over 14 channels, license-free worldwide, radiated power programmable from 0 dBm (1 mW) to 16 dBm (39 mW); low power option available for use outside the U.S.A. - limited to 10 dBm (10 mW)
RF communication protocol	IEEE 802.15.4
Power source	Internal: 3.7 V dc, 650 mAh rechargeable battery External: 3.2 V dc to 9 V dc
Power consumption	1 burst /10 minutes: 2.9373 mA (10.57 mW), 1 burst/hr: 0.6957 mA (2.50 mW), 1 burst/4 hrs: 0.2875 mA (1.04 mW), 1 burst/24 hrs: 0.1738 mA (0.63 mW) (all sampling @ 10 kHz with 5 second burst duration) See battery life calculator: http://www.microstrain.com/iepe-link-lxrs-battery-life-calculator
Operating temperature	-20 °C to +60 °C (-40 °C to +85°C available with external battery)
Physical Specifications	
Dimensions	94 mm x 79 mm x 21 mm
Weight	114 grams
Enclosure material	Aluminum
Environmental rating	Indoor use
Integration	
Compatible gateways	All WSDA® base stations and gateways
Compatible sensors	IEPE type sensors that operate within the node input specifications and have an output within ± 5 V dc (custom options available)
Connectors	10-32 coaxial (IEPE input), terminal block (future use)
Software	SensorCloud™, SensorConnect™, Node Commander®, WSDA® Data Downloader, Live Connect™, Windows XP/Vista/7 compatible
Software development kit (SDK)	Data communications protocol available with EEPROM maps and sample code (OS and computing platform independent) http://www.microstrain.com/wireless/sdk
Regulatory compliance	FCC (U.S.), IC (Canada), ROHS



*Measured with antennas elevated, no obstructions, and no RF interferers.

**Actual range varies depending on conditions such as obstructions, RF interference, antenna height, & antenna orientation.

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