

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 test and measurement, remote monitoring, system performance analysis, and embedded 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. Some nodes have integrated sensors, while others are designed with multi-sensor connectivity for application flexibility. 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.

- 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 sample rates from 1 KHz to 104 KHz
- 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

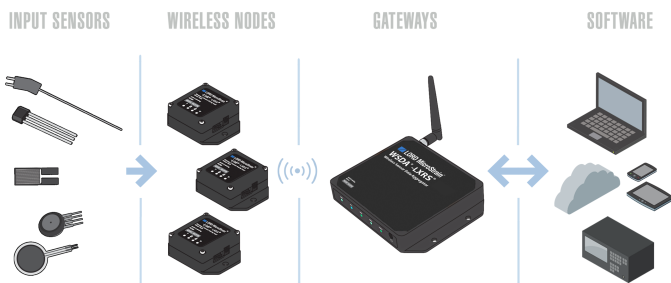
- High capacity, rechargeable battery for extended use
- Remote configuration, acquisition, and display of sensor data with SensorConnect™ or Node Commander®
- Optional web-based SensorCloud™ platform optimizes data storage, viewing, alerts, and analysis.
- Accepts most IEPE accelerometers

Cost Effective

- End-to-end wireless sensing solution reduces development and deployment time
- Volume discounts

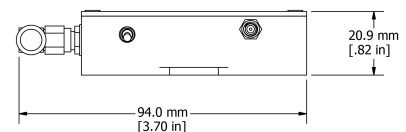
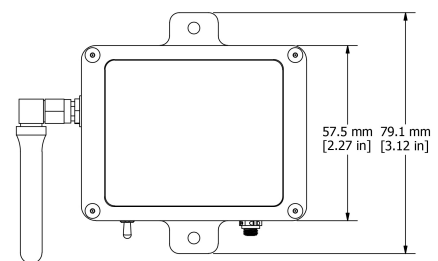
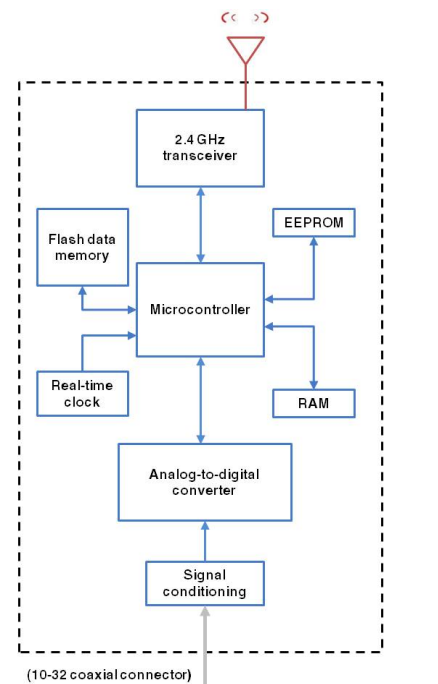
Applications

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



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/software/mscl
Regulatory compliance	FCC (U.S.), IC (Canada), ROHS



LORD SENSING

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

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