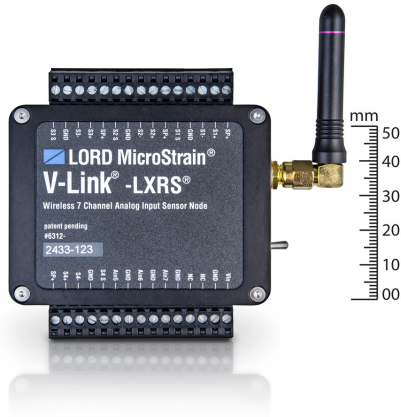# V-Link®-LXRS®

Wireless 7 Channel Analog Input Sensor Node

V-Link®-LXRS® - *versatile seven channel analog sensor node with high sample rates and datalogging capability*

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.

Product Highlights

- Four differential and three single-ended analog input channels and an internal temperature sensor
- Ideal for remote and long term measurement of many Wheatstone bridge and analog-type sensors including: strain, force, torque, pressure, acceleration, vibration, magnetic field, displacement, and geophones
- Continuous, periodic burst, and event-triggered sampling, and datalogging to internal memory
- User-programmable sample rates up to 10 KHz
- IP65/66 environmental enclosures available

Features and Benefits

High Performance
- Lossless data throughput and node-to-node sampling synchronization of ±32 µS in LXRS®-enabled modes
- High resolution data with 16-bit A/D converter
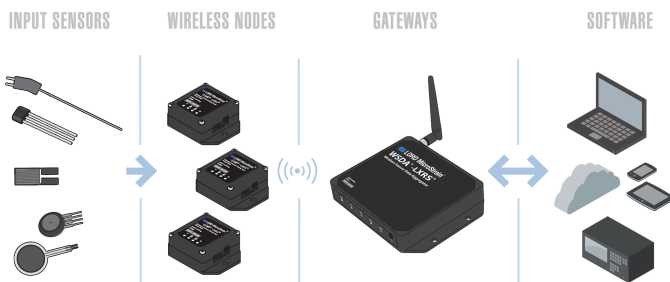- Wireless range up to 2 km (800 m typical)

Ease of Use
- Scalable networks for easy expansion
- Rapid deployment with wireless framework
- 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.
- Easy custom integration with open-source, comprehensive communications and command library

Cost Effective
- Reduction of costs associated with wiring
- Low-cost per channel with 7 input channels per node

Applications
- Condition-based monitoring
- Structural load and stress monitoring
- Test and measurement

Wireless Simplicity, Hardwired Reliability™

LORD SENSING

V-Link®-LXRS® Wireless 7 Channel Analog Input Sensor Node

Specifications

General	
Sensor input channels	**Differential analog,** 4 channels **Single-ended analog,** 3 channels
Integrated sensors	**Internal temperature,** 1 channel
Data storage capacity	4 M Bytes (up to 2 million data points)

Analog Input Channels	
Measurement range	Differential: full-bridge, ≥ 350 Ω (bridge completion factory-configurable) Single-ended: 0 to 3 V dc
Resolution	16 bit
Accuracy	± 0.1 % full scale typical
Anti-aliasing filter bandwidth	Single-pole Butterworth -3 dB cutoff @ 250 Hz (factory configurable)
Bridge excitation voltage	+ 3 V dc, 50 mA total for all channel (pulsed @ sample rates ≤ 16 Hz to conserve power)
Measurement gain and offset	User-selectable in software on differential channels, gain values from 21 to 13074

Integrated Temperature Channel	
Measurement range	-40 °C to 85 °C
Accuracy	± 2 °C (at 25 °C) typical
Resolution	16 bit

Sampling	
Sampling modes	Synchronized, low duty cycle, datalogging, event-triggered
Sampling rates	**Continuous sampling:** 1 sample/hour to 512 Hz **Periodic burst sampling:** 32 Hz to 10 KHz **Datalogging:** 32 Hz to 10 KHz
Sample rate stability	±3 ppm
Network capacity	Up to 2000 nodes per RF channel depending on sampling settings. Refer to the system bandwidth calculator: http://www.microstrain.com/configure-your-system
Synchronization between nodes	± 32 μsec

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 spread spectrum over 14 channels, power settings from 0 dBm (1 mW) to 16 dBm (39 mW)
RF communication protocol	IEEE 802.15.4
Power source	Internal: 3.7 V dc, 650 mAh Lithium ion rechargeable battery External: +3.2 to +9.0 V dc
Power consumption	See power profile : http://files.microstrain.com/V-Link-LXRS-Power-Profile.pdf
Operating temperature	-20 °C to + 60 °C (extended temperature range available with custom battery/enclosure, -40 °C to + 85 °C electronics only)
Acceleration limit	500 g standard (high g option available)

Physical Specifications	
Dimensions	74 mm x 79 mm x 21 mm
Weight	141 grams
Environmental rating	Indoor use (IP65/66 enclosures available)
Enclosure material	Anodized aluminum

Integration	
Compatible gateways	All WSDA® base stations and gateways
Compatible sensors	Differential analog sensors, 0 to 3 V dc analog sensors
Connectors	Screw terminal block
Shunt calibration	Internal shunt calibration resistor 499 KΩ, differential channels
Software	SensorCloud™, SensorConnect™, Node Commander®, Windows 7 (or newer)
Software development kit (SDK)	Open-source MicroStrain Communications Library (MSCL) with sample code available in C++, Python, and .NET formats (OS and computing platform independent) http://www.microstrain.com/software/mscl
Regulatory compliance	FCC (U.S.), IC (Canada), CE, ROHS
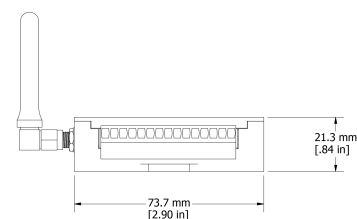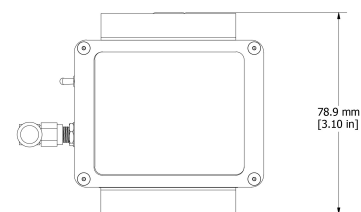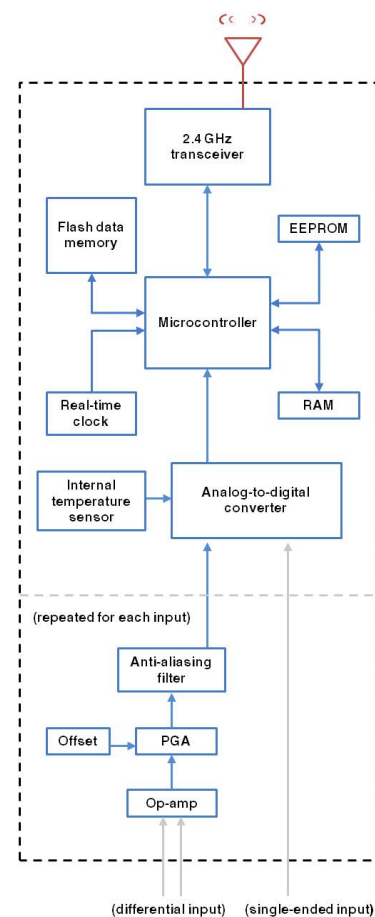
*Measured with antennas elevated, no obstructions, and no RF interferers.
**Actual range varies with conditions such as obstructions, RF interference, antenna height & orientation.

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