SG-Link®-RGD-LXRS®

Ruggedized Wireless 4 Channel Analog Sensor Node

SG-Link®-RGD-LXRS® - *versatile, ruggedized four-channel analog sensor node with integrated triaxial accelerometer*

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 analog input channels, integrated three-axis accelerometer, and an internal temperature sensor
- Supports conventional bonded foil, piezoelectric-resistive, Wheatstone bridge, and modular Columbia Research Labs-type strain gauges
- Triaxial MEMS accelerometer with a +/- 16 *g* range
- Continuous and periodic burst sampling modes, and datalogging to internal memory
- User-programmable sample rates up to 4096 Hz

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
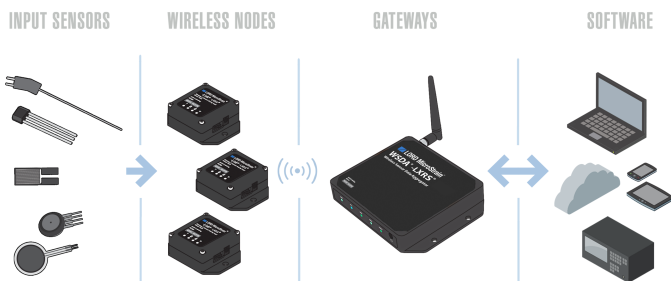- Wireless range up to 2 km (800 m typical)

Ease of Use
- Flex bonding cable and node form factor allow quick installation over existing strain gauges
- Scalable networks for easy expansion
- Low-profile ruggedized enclosure
- On-board shunt calibration

Cost Effective
- Reduction of costs associated with wiring
- End-to-end wireless sensing solution reduces development and deployment time

Applications

- Condition-based monitoring
- Test and measurement
- Robotics and machine control
- Wireless flight testing of fixed and rotary wing aircraft

Wireless Simplicity, Hardwired Reliability™

LORD SENSING

SG-Link®-RGD-LXRS® Ruggedized Wireless 4 Channel Analog Sensor Node

Specifications

General	
Sensor input channels	**Differential analog,** 4 channels
Integrated sensors	**Triaxial MEMS accelerometer,** 3 channels **Internal temperature,** 1 channel
Data storage capacity	2 M Bytes (up to 1 million data points)
Analog Input Channels	
Measurement range	Differential: full-bridge, ≥ 350 Ω (bridge completion factory-configurable)
Accuracy and resolution	± 0.1 % full scale typical, 16 bit resolution
Anti-aliasing filter bandwidth	Single-pole Butterworth -3 dB cutoff @ 250 Hz
Bridge excitation voltage	+ 2.7 V dc (pulsed @ sample rates ≤ 16 Hz to conserve power)
Measurement gain and offset	User-selectable in software on differential channels, gain values from 31 to 595
Integrated Accelerometer Channels	
Measurement range	± 16 *g*
Accuracy and resolution	± 4 m*g*, 13 bit resolution
Integrated Temperature Channel	
Measurement range	-40 °C to 85 °C
Accuracy and resolution	± 2 °C (at 25 °C) typical, 16 bit resolution
Sampling	
Sampling modes	Synchronized, low duty cycle, datalogging
Sampling rates	**Continuous sampling:** 1 sample/hour to 512 Hz **Periodic burst sampling:** 32 Hz to 4096 Hz **Datalogging:** 32 Hz to 4096 Hz
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	Replaceable 3.6 V dc, 1.7 Ah Tadiran TL-5935 Lithium 1/6 D-cell battery
Power consumption	960 uA (3.46 mW)with 3 channels @ 32 Hz, continuous 10.6 mA (38.16 mW) with 3 channels @ 256 Hz, continuous 4.0 mA (14.4 mW) with 1 channel @ 256 Hz, continuous
Operating temperature	-40 °C to + 85 °C
Acceleration limit	500 *g* standard (high *g* option available)
Physical Specifications	
Dimensions	101 mm x 46 mm x 26 mm
Weight	150 g (including battery)
EMI/EMC rating	MIL-STD-461F
Enclosure material	Clear polycarbonate
Integration	
Compatible gateways	All WSDA® base stations and gateways
Compatible sensors	Differential analog sensors
Connectors	Flex cable terminal/solder pads (flex cable included)
Shunt calibration	Internal shunt calibration resistor 499 KΩ, differential channels
Software	SensorCloud™, 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), ROHS
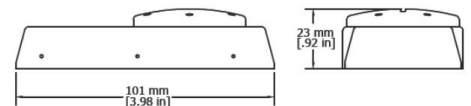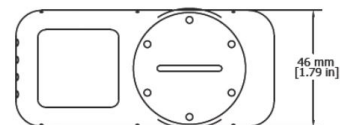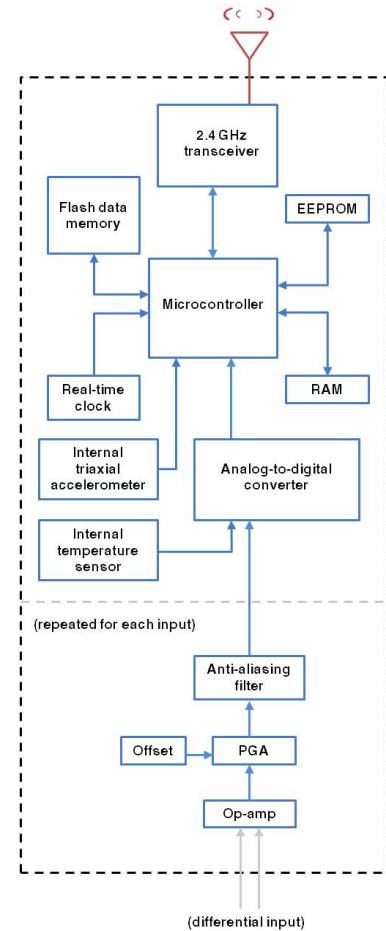
*Measured with antennas elevated, no obstructions, and no RF interferers.
**Actual range varies with conditions such as obstructions, RF interference, antenna height & orientation.

LORD SENSING

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