

## SG-Link<sup>®</sup>-LXRS<sup>®</sup>

### Wireless 2 Channel Analog Input Sensor Node

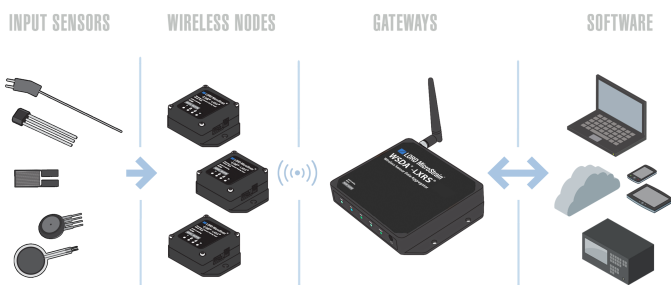


SG-Link<sup>®</sup>-LXRS<sup>®</sup> - small, low-power two-channel analog sensor node with many sampling options

**LORD MicroStrain<sup>®</sup> LXRS<sup>®</sup> 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,  $\pm 32$  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<sup>®</sup> software. The web-based SensorCloud<sup>™</sup> interface optimizes data aggregation, analysis, presentation, and alerts for gigabytes of sensor data from remote networks.



### Product Highlights

- One differential and one single-ended analog input channel 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 and periodic burst sampling modes, and datalogging to internal memory
- User-programmable sample rates up to 4096 Hz
- IP65/66 environmental enclosures available

### Features and Benefits

#### High Performance

- Lossless data throughput and node-to-node sampling synchronization of  $\pm 32 \mu\text{s}$  in LXRS<sup>®</sup>-enabled modes
- 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<sup>™</sup> or Node Commander<sup>®</sup>
- Optional web-based SensorCloud<sup>™</sup> platform optimizes data storage, viewing, alerts, and analysis.
- Easy custom integration with open-source, comprehensive communications and command library

#### Cost Effective

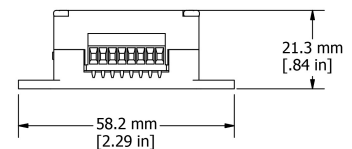
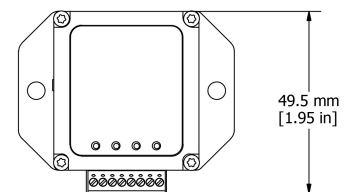
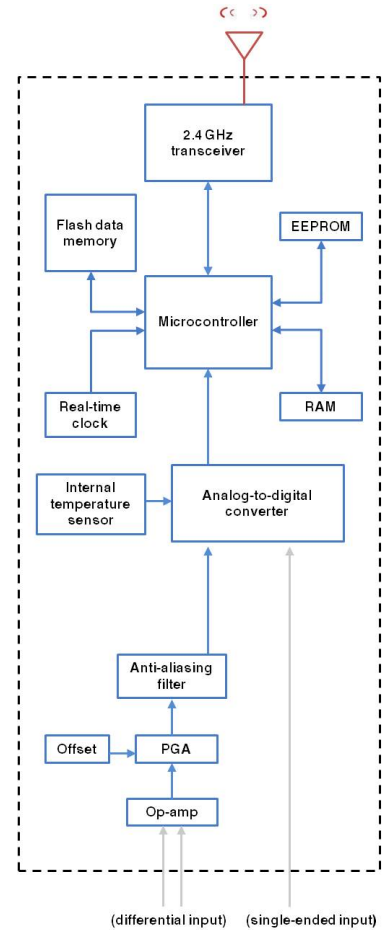
- End-to-end wireless sensing solution reduces development and deployment time
- Volume discounts

### Applications

- Condition-based monitoring
- Structural health monitoring
- Test and measurement
- Robotics and machine control

## Specifications

| General                                  |  |
|--|--|
| Sensor input channels                    | Differential analog, 1 channel<br>Single-ended analog, 1 channel   |
| Integrated sensors                       | Internal temperature, 1 channel  |
| Data storage capacity                    | 2 M Bytes (up to 1 million data points)  |
| Analog Input Channels                    |  |
| Measurement range                        | Differential: full-bridge, $\geq 350 \Omega$<br>(bridge completion factory-configurable)<br>Single-ended: 0 to 3 V dc  |
| Resolution                               | 12 bit   |
| Accuracy                                 | $\pm 0.1\%$ full scale typical   |
| Anti-aliasing filter bandwidth           | Single-pole Butterworth<br>-3 dB cutoff @ 250 Hz (factory configurable)  |
| Bridge excitation voltage                | +3 V dc, 50 mA total for all channel<br>(pulsed @ sample rates $\leq 16$ Hz to conserve power)   |
| Measurement gain and offset              | User-selectable in software on differential channels, gain values from 104 to 1800   |
| Integrated Temperature Channel           |  |
| Measurement range                        | -40 °C to 85 °C  |
| Accuracy                                 | $\pm 2$ °C (at 25 °C) typical  |
| Resolution                               | 12 bit   |
| Sampling                                 |  |
| Sampling modes                           | Synchronized, low duty cycle, datalogging  |
| Sampling rates                           | <b>Continuous sampling:</b> 1 sample/hour to 512 Hz<br><b>Periodic burst sampling:</b> 32 Hz to 4096 Hz<br><b>Datalogging:</b> 32 Hz to 4096 Hz  |
| Sample rate stability                    | $\pm 3$ ppm  |
| Network capacity                         | Up to 2000 nodes per RF channel depending on sampling settings. Refer to the system bandwidth calculator:<br><a href="http://www.microstrain.com/configure-your-system">http://www.microstrain.com/configure-your-system</a>                                 |
| Synchronization between nodes            | $\pm 32 \mu\text{sec}$   |
| Operating Parameters                     |  |
| Wireless communication range             | Outdoor/line-of-sight: 2 km (ideal) *, 800 m (typical)**<br>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, 250 mAh Lithium ion rechargeable battery<br>External: +3.2 to +9.0 V dc  |
| Power consumption                        | See power profile :<br><a href="http://files.microstrain.com/SG-Link-LXRS-Power-Profile.pdf">http://files.microstrain.com/SG-Link-LXRS-Power-Profile.pdf</a>   |
| 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                               | 58 mm x 50 mm x 21 mm  |
| Weight                                   | 42 grams   |
| Environmental rating                     | Indoor use (IP65/66 enclosures available)  |
| Enclosure material                       | ABS plastic  |
| 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 K $\Omega$ , differential channel  |
| 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)<br><a href="http://www.microstrain.com/software/mscl">http://www.microstrain.com/software/mscl</a> |
| Regulatory compliance                    | FCC (U.S.), IC (Canada), ROHS  |



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\*Measured with antennas elevated, no obstructions, and no RF interferers.  
\*\*Actual range varies with conditions such as obstructions, RF interference, antenna height & orientation.