

ENV-Link™ -Pro-LXRS®

Wireless Environmental Sensor Node



ENV-Link™ -Pro-LXRS® - ruggedized environmental sensing node with inputs for two thermocouples, four single-ended 0 - 5 V sensors, and a relative humidity and temperature sensor (RHT)

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

- Inputs for two thermocouples, four single-ended 0 to 5 V dc sensors, and a relative humidity/temperature (RHT) sensor
- Ideal for remote, long-term environmental monitoring including; measurements of solar irradiance, temperature, relative humidity, soil moisture, leaf wetness, precipitation, wind speed and direction, water level, barometric pressure, conductivity, strain, and more
- Sealed IP67 enclosure for use outdoors and in harsh environments

Features and Benefits

High Performance

- Lossless data throughput and node-to-node sampling synchronization of $\pm 32 \mu\text{s}$ in LXRS-enabled modes.
- High resolution data with 24-bit A/D converter
- Wireless range up to 2 km (800 m typical)

Ease of Use

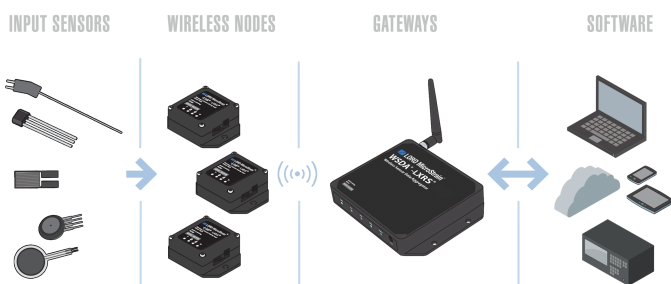
- Scalable networks for easy expansion
- Rapid deployment with wireless framework
- Low power consumption allows extended use.
- Remotely configure nodes, acquire and view sensor data with Node Commander®.
- Optional web-based SensorCloud™ interface optimizes data storage, viewing, alerts, and analysis.
- Easy custom integration with comprehensive SDK

Cost Effective

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

Applications

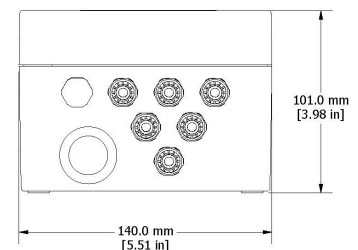
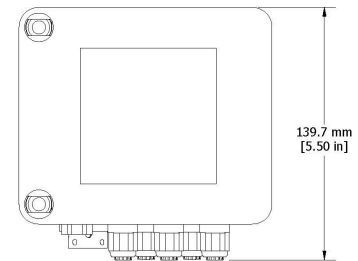
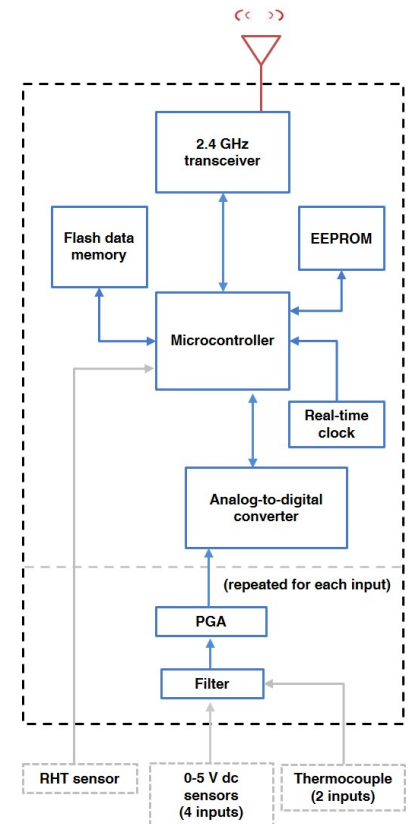
- Environmental monitoring
- Precision agriculture
- Ecological research
- Solar and wind site surveys



Wireless Simplicity, Hardwired Reliability™

Specifications

General	
Sensor input channels	Thermocouple inputs , 2 channels 0 to 5 V dc inputs , 4 channels RHT sensor input , 1 channel each (temperature and humidity), integrated sensor optional
Data storage capacity	2 M bytes (up to 500,000 data points)
Thermocouple inputs	
Measurement range	-210 °C to 1820 °C (depending on the thermocouple type)
Resolution	0.0625 °C, 24 bit
Accuracy	± 0.1 % FSO or ± 2 °C (not including error from sensor or wire)
Repeatability	± 0.1 °C (does not include error from sensor or wire)
0 to 5 V DC inputs	
Measurement range & resolution	0 to 5 V dc, 24 bit
Accuracy	0.01 % typical (absolute accuracy)
Sensor excitation	2 or 3 V dc (user selectable)
Relative Humidity and Temperature (RHT) Sensor Input	
Measurement range & resolution	0 to 100 % RH, -40 °C to 123 °C, 14 bit
Accuracy (RH)	± 2 % (10 to 90 % RH), ± 4 % (0 to 10% RH and 90 to 100% RH)
Accuracy (T)	± 0.3 °C typical
Sampling	
Sampling modes	Synchronized, low duty cycle, datalogging
Sampling rates	1 sample/hour to 2 Hz
Sample rate stability	±3 ppm
Network capacity	Up to 2000 nodes per RF channel (and per gateway) 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 direct sequence spread spectrum over 14 channels, license free worldwide, radiated power programmable from 0 dBm (1 mW) to 16 dBm (39 mW)
RF communication protocol	IEEE 802.15.4
Power source	Internal: rechargeable 3.6 V dc, 740 mAh Lithium ion battery (standard), or size D-cell 3.6 V dc Lithium thionyl chloride battery (optional); External: 3.3 V dc to 9.0 V dc
Operating temperature	-20 °C to + 60 °C (with rechargeable Lithium ion battery) -40 °C to + 85 °C (electronics only)
Physical Specifications	
Dimensions	140 mm x 140 mm x 101 mm
Weight	1360 grams
Environmental rating	IP67
Enclosure material	Fiberglass reinforced polyester
Integration	
Compatible gateways	All WSDA® base stations and gateways
Compatible sensors	Thermocouple inputs: all types 0 to 5 V dc inputs: pyranometers, photosynthetic photon flux, soil moisture, and leaf wetness sensors (all available from LORD MicroStrain®), thermocouples, rain and strain gauges, anemometers, and other 0 to 5 V dc sensors RHT input: LORD MicroStrain® RHT sensor, others may work but have not been tested, RHT sensor integration optional
Connectors	Water-tight cable seals with terminal blocks inside enclosure
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.