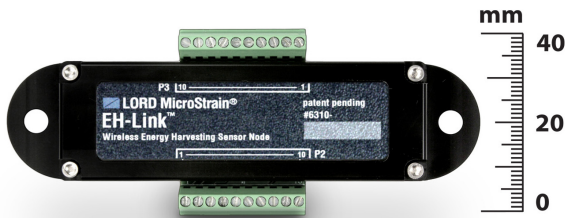


EH-Link[®]

Wireless Energy Harvesting Sensor Node



EH-Link[®] - versatile multi-sensor node that runs on ambient energy sources such as vibration, light, and thermoelectric

LORD MicroStrain[®] Wireless Sensor Networks enable, 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 wireless communication protocol between nodes and gateways enable high-speed sampling, and reliable data throughput.

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

- On-board high-speed triaxial accelerometer, internal temperature sensor, internal relative humidity sensor, and an analog input channel provide many sensing options.
- Sophisticated self-powered node can harvest energy from ambient energy sources for indefinite remote deployment.
- Supports auxiliary energy storage options such as super-capacitors and rechargeable thin film batteries

Features and Benefits

High Performance

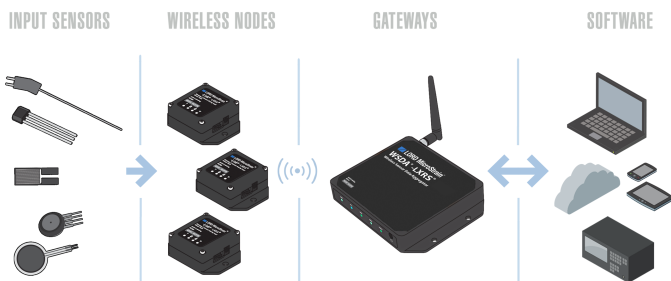
- User-programmable sample rates up to 512 Hz
- Scalable, wireless sensor networks up to 70 m
- Solar energy harvesting input operates in low light levels.
- Thermal energy harvesting input operates in thermal gradients below 8 °C when used with Peltier Thermoelectric Generators (TEGs).

Ease of Use

- Potential power sources include: low voltage solar cells (photovoltaic); electromagnetic fields (electrodynamics); thermal energy from temperature changes (thermoelectric); strain and vibration (piezoelectric); high impact energy, and capacitive discharge.
- Easy out-of-the-box wireless sensing for most analog sensors

Applications

- Condition-based monitoring
- Structural health monitoring
- Health monitoring of rotating components, aircraft, structures, and vehicles
- Self-powered sensing systems
- Production process monitoring
- Environmental monitoring



Wireless Simplicity, Hardwired Reliability[™]

Specifications

General	
Sensor input channels	Energy harvesting , 3 source types and channels Differential analog , 1 channel
Integrated sensors	Triaxial MEMS accelerometer , 3 channels Internal temperature , 1 channel Relative humidity , 1 channel
Energy Harvesting Inputs	
Wide range voltage (WRV) input	5 to 20 V ac/dc peak, (piezoelectric, electrodynamic, photovoltaic, electromagnetic)
Capacitive discharge voltage (CDV) input	20 to 130 V ac (pulsed piezoelectric)
Ultra-low voltage (ULV) input	20 to 600 mV dc (thermoelectric, Peltier, thermopile)
Analog Input Channel	
Measurement range	Differential: full-bridge, $\geq 350 \Omega$ (factory configurable), user programmable gain and offset
Accuracy and resolution	$\pm 0.1\%$ full scale typical, 12 bit resolution
Bridge excitation voltage	+2.7 V dc, 50 mA (pulsed @ sample rates ≤ 16 Hz to conserve power)
Integrated Accelerometer Channels	
Measurement range	$\pm 16 g$
Accuracy and resolution	$\pm 4 mg$, 12 bit resolution
Integrated Temperature Channel	
Measurement range	-40 °C to 85 °C
Accuracy and resolution	± 2 °C (at 25 °C) typical, 12 bit resolution
Integrated Relative Humidity (RH) Channel	
Measurement range	0 to 100 %
Accuracy	$\pm 2\%$ (10 to 90 % RH), $\pm 4\%$ (0 to 10% RH and 90 to 100% RH)
Repeatability	$\pm 0.1\%$
Sampling	
Sampling modes	Low duty cycle
Sampling rates	Continuous sampling: 1 Hz to 512 Hz
Sample rate stability	± 3 ppm
Network capacity	Up to 2000 nodes per RF channel (and per gateway) depending on the number of active channels and sampling settings.
Operating Parameters	
Wireless communication range	70 m line of sight
Radio frequency (RF) transceiver carrier	2.405 to 2.470 GHz direct sequence spread spectrum over 14 channels, license-free worldwide, radiated power 0 dBm
RF communication protocol	IEEE 802.15.4
Energy use	Startup: 12 μ J; sampling: accelerometer or RH sensor only, 105 μ J/sample; sampling: differential input only, 168 μ J/sample; data transmission: 92.4 μ J/packet
Operating temperature	-20 °C to +60 °C
Operating humidity	0 to 95 %, non-condensing
Acceleration limit	500 g standard
Physical Specifications	
Dimensions	88 mm x 39 mm x 16 mm
Weight	26 grams
Integration	
Compatible gateways	All WSDA [®] base stations and gateways
Compatible sensors	Bridge type analog sensors (for analog inputs)
Connectors	Screw terminal blocks
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	ROHS

