

# TC-Link<sup>®</sup> 6CH-LXRS<sup>®</sup>

## 6 Channel Wireless Thermocouple Node



TC-Link<sup>®</sup>6CH-LXRS<sup>®</sup> - specialized node designed for data acquisition from up to six standard thermocouples

**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 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,  $\pm 32$  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

- Six standard mini thermocouple inputs, an embedded cold junction temperature compensation sensor, and optional integrated relative humidity sensor
- On-board linearization algorithms are software programmable to support a wide range of thermocouple types, including J, K, N, R, S, T, E, and B
- High resolution data with 24-bit A/D converter
- 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-enabled modes
- Support for hundreds of simultaneous sampling wireless sensor nodes
- Wireless range up to 2 km (800 m typical)

#### Ease of Use

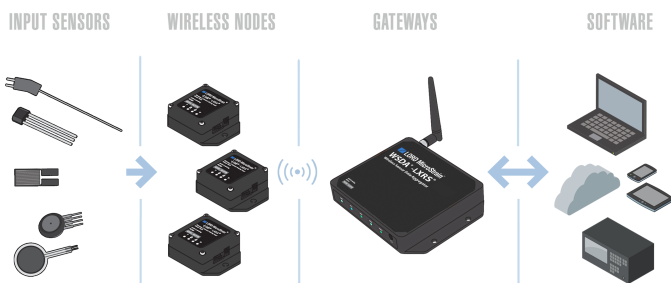
- Rapid deployment with wireless framework
- Standard miniature thermocouple blade connectors
- Remotely configure nodes, acquire and view sensor data with Node Commander<sup>®</sup>.
- Easy custom integration with comprehensive SDK

#### Cost Effective

- Reduction of costs associated with wiring
- Low-cost per channel with six thermocouples per node
- Volume discounts

### Applications

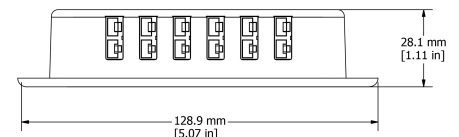
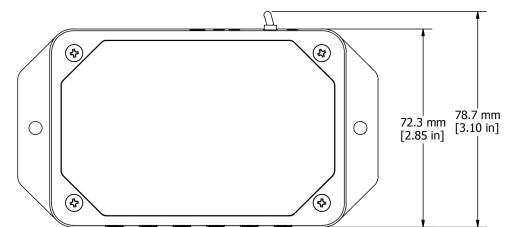
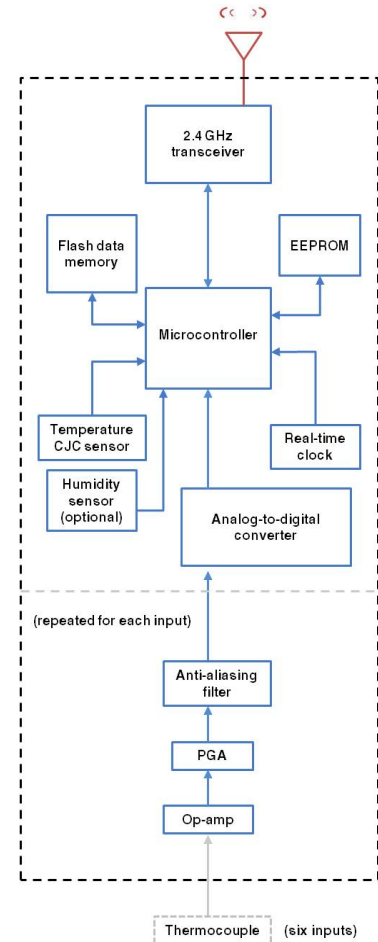
- Thermal profiling
- Refrigeration monitoring
- Production process monitoring
- Quality control
- Environmental monitoring



*Wireless Simplicity, Hardwired Reliability<sup>™</sup>*

## Specifications

General	
Sensor input channels	Thermocouple input, 6 channels
Integrated sensors	Temperature CJC, 1 channel Relative humidity (optional), 1 channel
Data storage capacity	2 Megabytes (up to 500,000 data points)
Thermocouple Input	
Measurement range	-210 °C to 1820 °C (depending on the thermocouple type)
Accuracy	± 0.1 % of full scale or ± 2 °C, whichever is greater (does not include error from sensor or wire)
Resolution	0.0625 °C, 24 bit
Repeatability	± 0.1 °C (does not include error from sensor or wire)
Integrated Temperature Cold Junction Compensation (CJC) Channel	
Compensation range	-40 °C to 85 °C
Accuracy and resolution	± 0.5 °C (from 0 to 70 °C), 12 bit resolution
Integrated Relative Humidity Channel (optional)	
Measurement range	0 to 100 %
Accuracy	± 2 % (10 to 90 % RH), ± 4 % (0 to 10% RH and 90 to 100% RH)
Repeatability	± 0.1 %
Sampling	
Sampling modes	Synchronized, low duty cycle, datalogging
Sampling rates	<b>Continuous sampling:</b> 1 sample/hour to 8 Hz <b>Datalogging:</b> 1 sample/hour to 8 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. Refer to the system bandwidth calculator: <a href="http://www.microstrain.com/configure-your-system">http://www.microstrain.com/configure-your-system</a>
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); low power option available for use outside the U.S. - limited to 10dBm (10mW)
RF communication protocol	IEEE 802.15.4
Power source	Embedded internal: 3.7 V dc, 650 mAh rechargeable Li-poly battery, Replaceable internal (not included): 3.6 V dc type AA Lithium-thionyl chloride (LiSOC12), External: 3.2 V dc to 9 V dc
Power consumption	See power profile : <a href="http://files.microstrain.com/TC-Link-6CH-LXRS-Power-Profile-1.pdf">http://files.microstrain.com/TC-Link-6CH-LXRS-Power-Profile-1.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)
MTBF	1,500,000 hours (Telcordia method, SR332)
Physical Specifications	
Dimensions	129 mm x 73 mm x 28 mm excluding switch
Weight	151 grams
Environmental rating	Indoor use (IP65/66 enclosures available)
Integration	
Compatible gateways	All WSDA® base stations and gateways
Compatible sensors	Type J, K, N, R, S, T, E and B thermocouples
Connectors	Type-1 standard mini (SM) connectors for flat pin thermocouples
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) <a href="http://www.microstrain.com/wireless/sdk">http://www.microstrain.com/wireless/sdk</a>
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.