

# WSDA<sup>®</sup>-1500-LXRS<sup>®</sup>

## Wireless Sensor Data Aggregator



WSDA<sup>®</sup>-1500-LXRS<sup>®</sup> - network-ready gateway for high-speed, sophisticated data aggregation, with J1939 CAN and Ethernet interfaces

**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**. 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

- Ethernet-based gateway configures, coordinates, and collects sensor data from a scalable network of wireless sensor nodes
- Configurable to operate with a static IP, a DHCP-enabled LAN, or as a datalogger to local memory
- Push all or selected sensor data to a J1939 CAN bus
- Seamless integration with SensorCloud<sup>™</sup> for secure, web-based data access from around the world

### Features and Benefits

#### High Performance

- Lossless data throughput and node-to-node sampling synchronization of  $\pm 32$   $\mu$ s in LXRS-enabled modes
- Wireless range up to 2 km (800 m typical)

#### Ease of Use

- Compatible with all LORD MicroStrain<sup>®</sup> sensor nodes
- Remote configuration, acquisition, and display of sensor data with SensorConnect<sup>™</sup> or Node Commander<sup>®</sup>
- Data visualization through web-based SensorCloud<sup>™</sup> portal for quick data navigation and analysis
- Easy custom integration with open-source, comprehensive communications and command library
- Connect the gateway to a cellular or wi-fi modem for wireless connectivity to the host network

#### Cost Effective

- Thousands of sensors managed from a single gateway
- Reduction of costs associated with wiring

### Applications

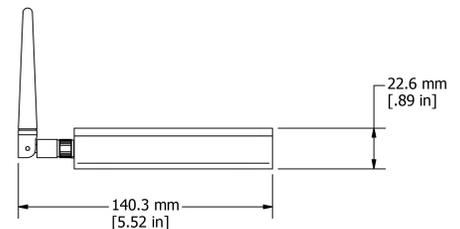
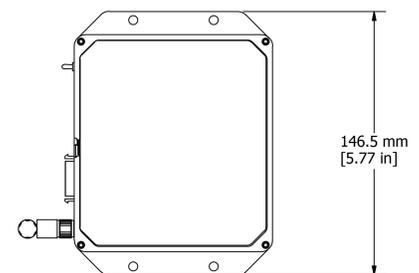
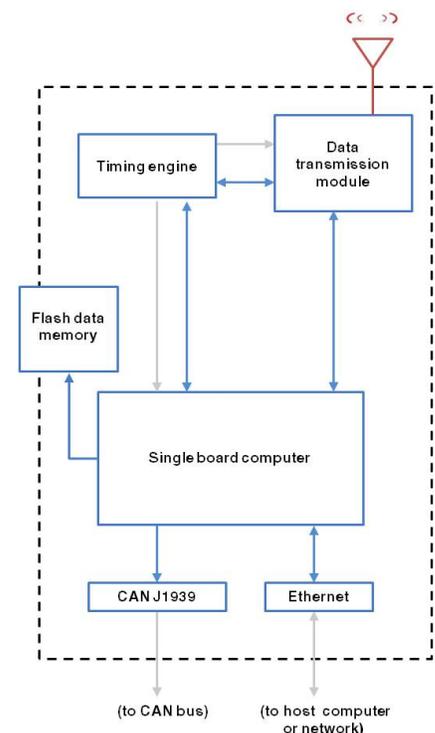
- Remote and web-based wireless sensor data acquisition
- Condition-based monitoring
- Equipment performance monitoring, verification, evaluation, and diagnostics
- System control



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

## Specifications

General	
Processor	ARM® Cortex™ A8, 1 GHz
Operating system	Linux
Connectivity	Ethernet IEEE 802.3 10/100 Mbps, IEEE 802.15.4 wireless, J1939 CAN (output only)
Internet standards	HTTP, HTTPS, TCP/IP, UPnP
IP assignment	IPV4 Static or DHCP
Data storage memory	4 G bytes Micro SD (optional upgrade to 8 GB or 16 GB)
Time synchronization	Network time protocol (NTP), Real time clock (RTC), last used, manual entry
CAN J1939 Output	
J1939 Bit Rate	250 K bps, 500 K bps, 1 M bps
J1939 Source	Static or dynamic via SAE Name
J1939 Destination	Static or SAE Name
J1939 Modes	Tunnel data to destination using PGN 0xEF00, or broadcast data values using PGNs 0xFF00 – 0xFFFF
Standard bus termination	120 Ω
Sampling	
Supported node sampling modes	Synchronized, low duty cycle, continuous, periodic burst, event-triggered, and datalogging
Synchronization beacon interval	1 Hz beacon provides ± 32 μsec node-to-node synchronization
Synchronization beacon 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>
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 ISM band 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.A. - limited to 10 dBm (10 mW)
RF communication protocol	IEEE 802.15.4
Power source	9.0 to 30.0 V dc (universal 12 V dc, 1.67 A AC/DC converter included in starter kit)
Power consumption	2900 mW (max), 2300 mW (typ) @ 12 V dc
Operating temperature	-40 °C to +85 °C
MTBF	408,000 hours (Telcordia method, SR332)
Physical Specifications	
Dimensions	147 mm x 110 mm x 23 mm without antenna
Weight	346 grams
Enclosure material	Black anodized aluminum
Integration	
Connectors	RJ45 jack, 26 pin multi-port, 2.1mm power jack
Communications cable	Ethernet (CAT6 cable included in starter kit)
Compatible sensor nodes	All LXRS® sensor nodes, all legacy 2.4 GHz nodes
Firmware	Firmware and OS upgradeable through web interface
Software compatibility	SensorCloud™, SensorConnect™, Node Commander®, WSDA® Data Downloader, Live Connect™, Windows 7 (and newer)
Software development	Open-source MicroStrain Communications Library (MSCL) with sample code available in C++, Python, and .NET formats (OS and computing platform independent) <a href="http://lord-microstrain.github.io/MSCL/">http://lord-microstrain.github.io/MSCL/</a>
Regulatory compliance	FCC (U.S.), IC (Canada), CE, 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.