

Extended Range Synchronized Wireless Strain Node



Introduction

Featuring complete strain gauge signal conditioning, embedded processing, wireless communications, and precision timekeeping, SG-Link[®]-mXRS wireless nodes operate within a fast, synchronized, scalable network of wireless sensor nodes located up to 1 km from our WSDA[®]-Base. SG-Link[®]-mXRS nodes include an internal rechargeable Li-Ion battery and measure strain, torque, load, pressure and magnetic fields through a connector to user-supplied bridge sensors.

Features & Benefits

- Support for hundreds of simultaneous sampling wireless sensor nodes
- Node to node synchronization of +/- 32 microseconds
- Ultra-stable on-board precision timing reference of +/- 3 ppm over industrial temperature range
- programmable communication range from 70m to 2,000m

Applications

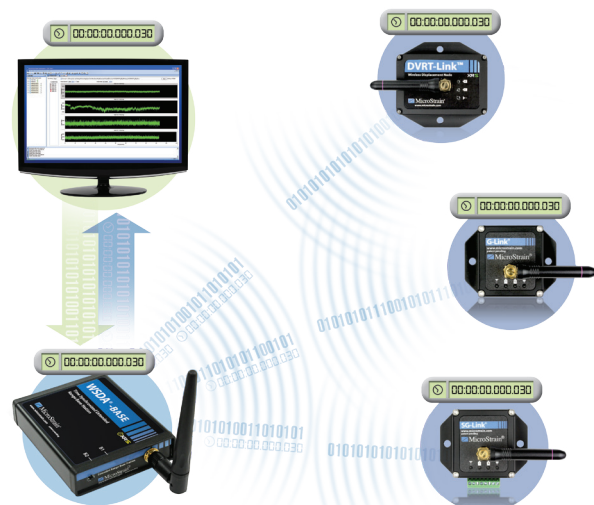
- Wireless flight testing of aircraft
- Condition-based monitoring of machines
- Health monitoring of structures and vehicles
- Smart structures and materials
- Experimental test and measurement
- Robotics and machine automation
- Vibration and acoustic noise testing
- Sports performance and sports medicine analysis
- Distributed security networks

System Overview

At the heart of MicroStrain's extended range synchronized (mXRS[™]) system is the WSDA[®]-Base, which uses our exclusive beaconing protocols to synch precision timekeepers embedded within each sensor node in the network. The WSDA[®]-Base also coordinates data collection from all sensor nodes, including SG-LINK-mXRS. Users can easily program each node on the scalable network for simultaneous, periodic, or burst mode sampling with our Node Commander[®] software, which then automatically configures network radio communications to maximize the aggregate sample rate.

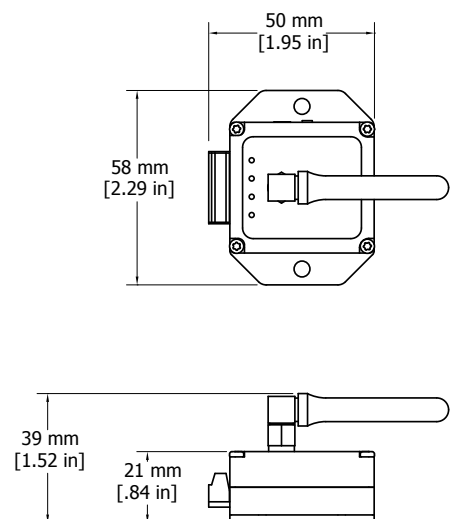
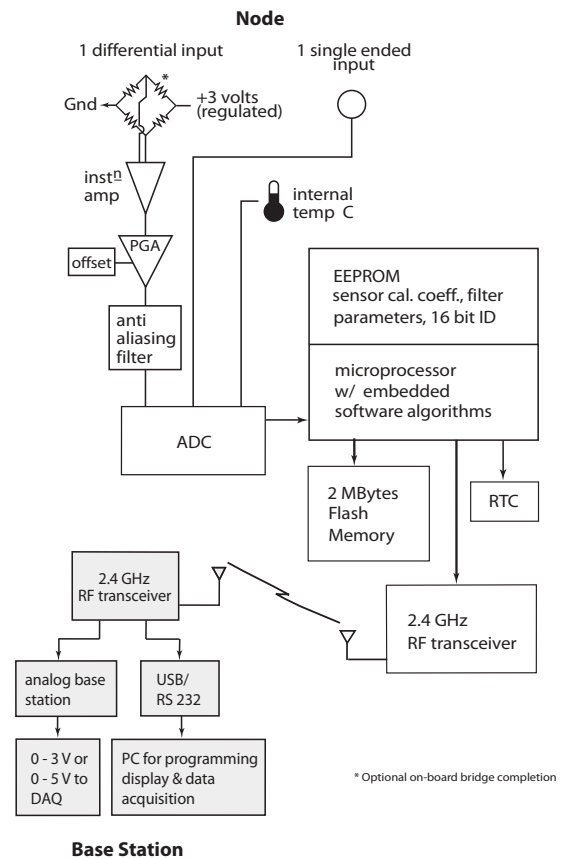
mXRS[™]

MicroStrain[®] Extended Range Synchronized Wireless Sensing System



Specifications

Input channels	1 full differential input channel, 350 Ω resistance or higher (with optional bridge completion), 1 single ended input (0 - 3 volts maximum), and internal temperature sensor
Temperature sensor	-40 °C to 70 °C range, typical accuracy ± 2 °C (at 25 °C)
Anti-aliasing filter bandwidth:	-3 dB cutoff at 500 Hz (factory adjustable)
Measurement Accuracy	$\pm 0.1\%$ full scale typical
Resolution	1 bit: 0.024% 1 microstrain typical for 3 wire full bridge strain gauge (when used in accordance with MicroStrain® recommendations)
DC bridge excitation	+3 volts DC at 50 mA maximum (pulsed to sensors for sample rates of 100 Hz and below to conserve power)
Programmable gain	software programmable: 104 to 1800
Programmable offset	software programmable
Analog to digital (A/D) converter	successive approximation type, 12 bit resolution
Data storage capacity	2 megabytes (approximately 1,000,000 data points)
Data logging mode	log up to 1,000,000 data points (from 100 to 65,500 samples or continuous) at 32 Hz to 2048 Hz
Sensor event driven trigger	commence datalogging when threshold exceeded
Sample Rates	1/hr - 4 kHz; synchronous mode 1 Hz - 512 Hz
Synchronous Sampling Mode Network Capacity	transmit real time data from node to PC - rate depends on number of active channels and transmitting nodes. e.g.: 3 nodes, 1 channel, 512 Hz 15 nodes, 1 channel, 256 Hz 31 nodes, 1 channel, 128 Hz 63 nodes, 1 channel, 64 Hz 127 nodes, 1 channel, 32 Hz sample rates and # of channels are easily configured within Node Commander Network Configuration Wizard
Synchronization between nodes	+/- 32 μ sec in synchronous sampling mode with 10 second beacon interval
Synchronous sample rate stability	+/- 3 ppm
Wireless shunt calibration	channel 1, internal shunt calibration resistor 499 K Ω
Radio frequency (RF) transceiver carrier	2.4 GHz direct sequence spread spectrum, license free worldwide (2.405 to 2.480 GHz) - up to 16 channels, radiated power programmable from 0 dBm (1 mW) to 20 dBm (100 mW)
RF data packet standard	IEEE 802.15.4, open communication architecture
RF data downloading	8 minutes to download full memory
Range for bi-directional RF link	programmable communication range from 70m to 2,000m
Internal Li-Ion battery	3.7 volt 250 mAh lithium ion rechargeable battery or external power 3.2 to 9 volts
Power consumption	SG-Link® node only: real-time streaming - 2.4 mA, datalogging - 25 mA, sleeping - 0.1 mA with 1000 ohm strain gauge
Operating temperature	-20 °C to +60 °C with standard internal battery and enclosure, extended temperature range optional with custom battery and enclosure, -40 °C to +85 °C for electronics only
Maximum acceleration Limit	500 g standard (high g option available)
Dimensions	58 mm x 50 mm x 26 mm (enclosure without antenna) 46 mm x 36 mm x 16 mm (circuit board assembly only) for dimensional print go to www.microstrain.com
Weight	50 g (with enclosure); 17 g (circuit board assembly only)
Enclosure material	ABS plastic
Software	Node Commander® Windows XP/Vista compatible
Compatible base stations	USB, RS-232, Analog, WSDA-Base, WSDA
FCC ID	XJQMSLINK0001
IC ID	8505A-MSLINK0001



MicroStrain®

MicroStrain Inc.
459 Hurricane Lane,
Suite 102
Williston, VT 05495 USA
www.microstrain.com

ph: 800-449-3878
fax: 802-863-4093
sales@microstrain.com