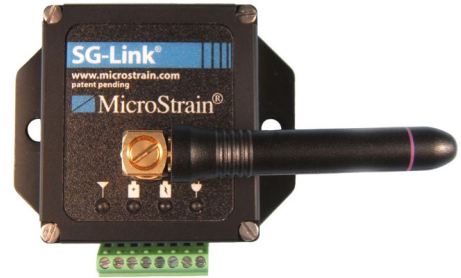


SG-Link[®]

2.4 GHz Wireless Strain Node



Introduction

With one differential channel, which includes full strain gauge conditioning and programmable offset, and one single ended channel, the **SG-Link[®]** wireless strain node is compatible with most types of analog sensor. It is fast, extremely versatile and designed to operate as part of a high speed wireless sensor network.

Featuring 2 KHz sweep rates, combined with 2 MB flash memory, these little nodes pack a lot of power in a small package. With every node in the wireless network assigned a unique 16 bit address, a single host transceiver can address thousands of multi-channel sensor clusters.

The bi-directional RF communications link can trigger a sample to be logged from 70 meters, or request real-time data to be transmitted to the host PC for data acquisition/analysis. The frequency agile system enables simultaneous real-time streaming from up to 16 nodes in the 2.4 GHz range.

The scalable system architecture and programmable sensor interface enables a new generation of wireless sensor networks. The **SG-Link[®]** wireless strain node is compatible with a wide range of wheatstone bridge type sensors, including strain gauges, displacement sensors, load cells, torque transducers, pressure sensors, accelerometers, geophones, temperature sensors, inclinometers, and others.

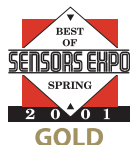
A Software Development Kit is available, which includes fully-commented source code and a compiled executable for: Microsoft[®] Visual Studio C++ .NET 7.1, Microsoft[®] VB 6.0, Microsoft[®] VB.NET 2003, Microsoft[®] VB.NET 2005 and LabVIEW[®] 7.1.

Features & Benefits

- 2.4 GHz direct sequence spread spectrum radio is license free worldwide
- IEEE 802.15.4 open communication architecture
- supports simultaneous streaming from multiple nodes to PC
- datalogging rates up to 2048 Hz, storing up to 1,000,000 measurements
- real-time streaming rates up to 4 KHz
- communication range up to 70 m line-of-sight, 300 m with high gain antennas
- regulated 3 volt sensor excitation supports most analog sensors
- on-board bridge completion resistors
- includes internal resistor for wireless shunt calibration
- low power consumption for extended use
- internal rechargeable battery

Applications

- 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





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 250 Hz (factory adjustable)
Measurement Accuracy	± 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
Real-time streaming mode	transmit real time data from node to PC - rate depends on number of active channels: 1 channel - 4 KHz, 2 channels - 2 KHz, 3 channels - 1.33 KHz
Low duty-cycle mode	supports multiple nodes on single RF channel, from 1 sample per hour to 250 Hz
Synchronization between nodes	datalogging ±4 μsec ± 50 ppm, LDC mode time stamped at PC
Sample rate stability	± 25 ppm for sample rates > 1 Hz, ±10% for sample rates ≤ 1 Hz
Wireless shunt calibration	channel 1, internal shunt calibration resistor 499 KΩ
Radio frequency (RF) transceiver carrier	2.4 GHz direct sequence spread spectrum, license free worldwide (2.405 to 2.480 GHz) - 16 channels, radiated power 0 dBm (1 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	70 m line-of-sight, up to 300 m with optional high gain antenna
Internal Li-Ion battery	3.7 volt lithium ion rechargeable battery, 250 mAh capacity. Customer may supply external power from 3.2 to 9 volts
Power consumption	SG-Link® node only: real-time streaming - 25 mA, datalogging - 25 mA, sleeping - 0.1 mA external sensors: 350 Ω strain gauge - 8 mA, 1000 Ω strain gauge - 3 mA (to calculate total power consumption, add sensor consumption to above)
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®

