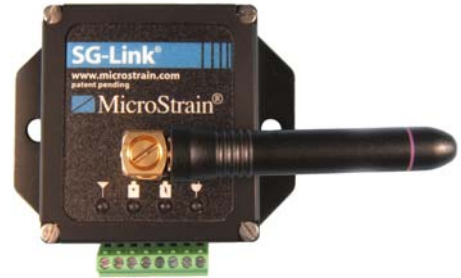


SG-Link[®]

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[®] is compatible with most types of analog sensor. Fast and extremely versatile, the SG-Link[®] is designed to operate as part of a high speed wireless sensor network.

Featuring 2 KHz sweep rates, combined with 2 Mbytes 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[®] 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.

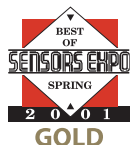
A Software Development Kit is available, which includes fully-commented source code and a compiled executable for: Microsoft[®] C++ 6.0, Microsoft[®] Visual Studio C++ .NET 7.1, Microsoft[®] VB 6.0, Microsoft[®] VB.NET 2003, Microsoft[®] VB.NET 2005 and LabVIEW[®] 7.1.

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
- real-time streaming rates up to 4 KHz
- on-board memory stores up to 1,000,000 measurements
- communication range up to 70m line-of-sight, 300m 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

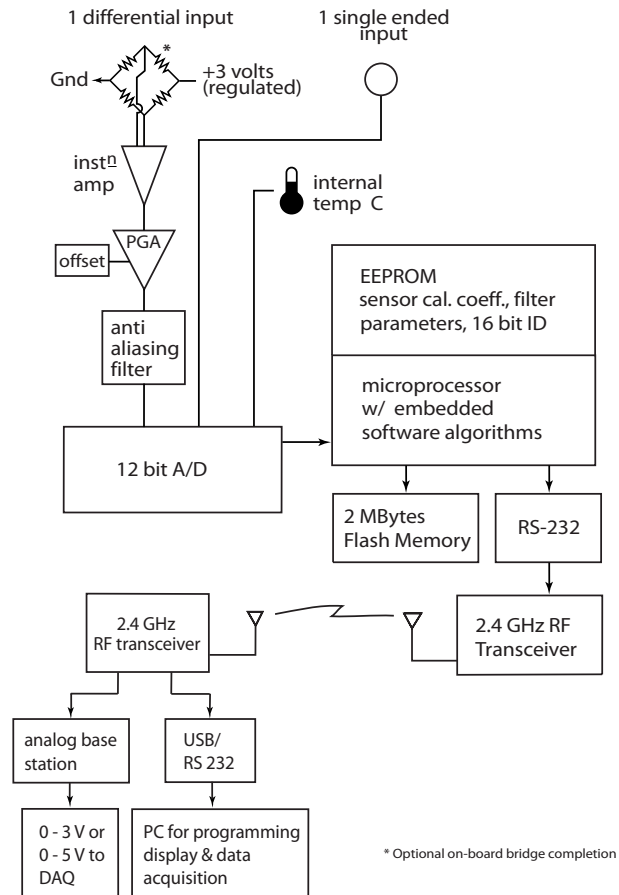
- condition-based monitoring of machines
- health monitoring of civil structures and vehicles
- smart structures and materials
- experimental test and measurement
- robotics and machine automation
- vibration and acoustic noise testing
- sports performance and sports medicine analysis
- distributed security 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	-25 °C to 70 °C range, accuracy ±4 °C
Measurement Accuracy	± 0.1% typical
Resolution	± 1 bit 0.0024% ±1 microstrain typical for 3 wire quarter bridge strain gauge
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: 2 to 1831
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, total update bandwidth of 500 Hz divided by number of nodes
Synchronization between nodes	datalogging 100 μsec ± 50 ppm. LDC mode time stamped at PC
Sample rate stability	datalogging and LDC (mode(2Hz to 500Hz) 100 μsec ± 25 ppm (90 msec/hour) LDC mode (1 Hz to 2 samples per hour) ±10%
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 (2.450 to 2.490 GHz) - 16 channels
RF data packet standard	IEEE 802.15.4, open communication architecture
RF programming & 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, 200 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 - 0.5 mA External sensors: 350 Ω strain gauge - 8 mA, 1000 Ω strain gauge - 3 mA (add sensor consumption to above to calculate total power consumption)
Operating temperature	-20 to +60 °C with standard internal battery and enclosure, extended temperature range optional with custom battery and enclosure. -40 to +85 °C for electronics only
Dimensions*	58 mm x 49 mm x 26 mm without antenna (board only 47 mm x 36 mm x 24 mm)
Weight	46 grams
Case	ABS plastic
Software	Agile-Link™ Windows XP compatible
PC Comm	serial port, 115.2 kBaud

*For dimensioned print go to www.microstrain.com



MicroStrain®

MicroStrain Inc.
310 Hurricane Lane, Unit 4
Williston, VT 05495 USA
www.microstrain.com

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