PRESS RELEASE

MicroStrain, Inc. announces the new Agile-Link ™ product family of frequency agile wireless sensor networks.

June 4th, 2004

Williston, Vermont

MicroStrain is a leading designer and manufacturer of addressable, data logging wireless sensor nodes capable of fast (2K sample/sec/channel) data rates.

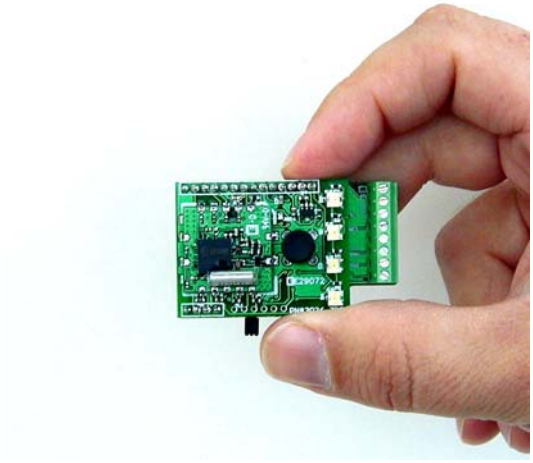

Figure 1. Agile-Link ™ wireless strain gauge node with integral rechargeable battery.

Previous award winning wireless systems from MicroStrain tightly controlled the flow of data from sensor nodes to base station. This structure was required to prevent nodes from interfering with one another, due to a limited number of available radio frequency (RF) bands. To control data flow, the base station would request that a specific addressable node on the network send or stream wireless data, then, on receiving this command, the addressable node would respond.

MicroStrain's engineers recognized a need in the sensing industry for multiple, independent wireless sensing nodes capable of communicating over the airwaves simultaneously. Test & measurement engineers as well as control system engineers require strain, acceleration, torque, force, pressure, and temperature measurements to be made at high data rates and in real time. The sensing nodes need to be distributed over their structure or machine under test.

The wireless data obtained in real time is used to protect valuable process equipment from overloads, or to help research engineers to better visualize and interact with the system under test.

New Product Line: MicroStrain's Agile-Link ™ product family (patents pending) is a wireless sensor data acquisition system capable of simultaneous, high speed data acquisition, for use with wireless strain gauges, accelerometers, temperature, and millivolt level inputs. Figure 1 is a photo of the new, miniature, frequency agile strain gauge module. Figure 2 is a photo of the new, frequency agile base station. These are currently available with serial (RS-232 & USB), Sony Clie ®, and analog output interfaces.

Figure 2. Agile-Link ™ wireless PDA base station transceiver is powered by the PDA port.

How it Works: MicroStrain, Inc. has developed "frequency agile" sensor transceiver nodes and base stations, which can use a wide range of RF communications frequencies through software configuration. This technique, termed frequency division multiplexing (FDM), allows multiple wireless sensing nodes to communicate simultaneously without RF interference between them.

MicroStrain's new Agile-Link ™ wireless sensing systems support up to 26 distinct nodes and base stations to communicate real time digital sensor data simultaneously in the license free ISM band (902-928 Mhz, bandwidth 76.8 kbaud). Furthermore, the RF power levels used for transmission may also be programmed in software. High receiver sensitivity (>110 dBm) allows the nodes to cover distances of ~150 meters line of sight.

Figure 3 is a functional block diagram showing eight wireless base stations directly interfaced to the USB port of a notebook computer. The base stations each operate on a separate frequency band, and draw power from the USB port, providing a fully portable and expandable wireless base station.

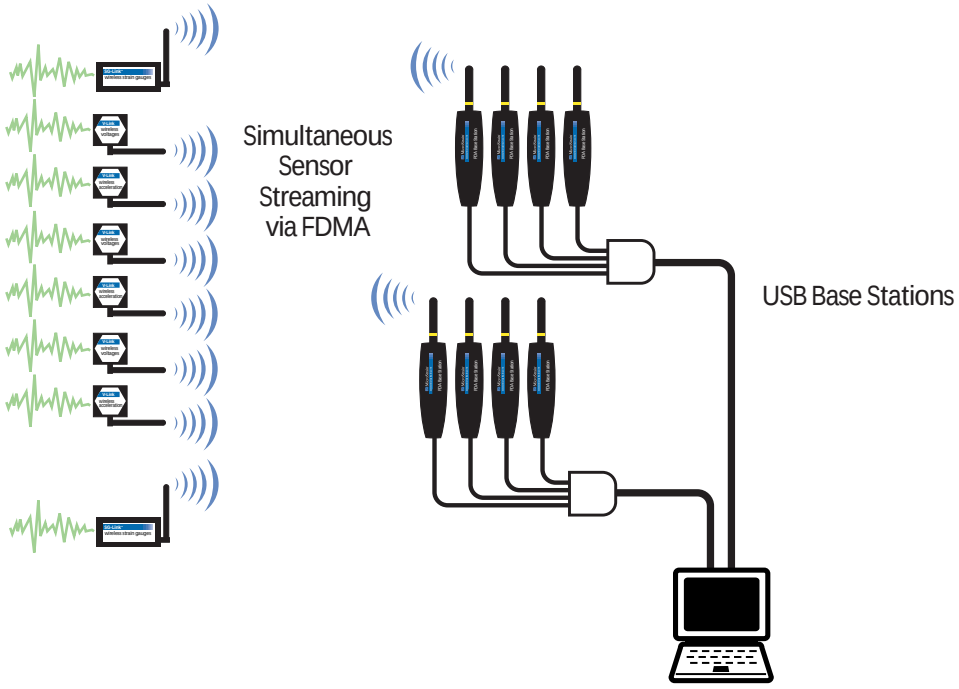

Figure 3. Agile-Link ™ wireless USB base station transceivers collect data from eight multi-channel sensor nodes simultaneously.

Test & measurement applications often require the combination of wireless strain measurement systems to be used alongside hard-wired sensors, all connected to an existing analog data acquisition system. In order to easily support these applications, MicroStrain has released Agile-Link ™ analog output base stations that collect analog data from multi-channel Agile-Link ™ sensor nodes and then reconstructs the analog waveforms on the base station's outputs. Each analog output base station includes a microprocessor, hardware low pass filter, and 12-bit digital to analog converter (DAC). The serial data stream is converted by the base station into multi-channel, high level analog output voltages, ranging from 0 to 5 volts full scale.

Digital RF communications possess several advantages over traditional analog methods-digital data is very "clean", or hard to interfere with. Another advantage of digital RF communications is that any errors caused by interference can be flagged by sending a checksum byte. The received checksum byte is compared to the calculated sum of the received bytes by the base station. If the calculated sum does not equal the received checksum, the processor within the base station can flag these data. MicroStrain provides a unique "checksum channel" on its Agile-Link ™ analog output base stations. The checksum channel is programmed to output a high analog voltage in the event that a checksum is detected; this voltage is easily interfaced to traditional analog data acquisition systems.

To facilitate the use of wireless strain gauges, MicroStrain has released a PC based Agile-Link ™ software package for Windows 95/98/2000/XP machines. In addition, a new Strain Wizard ™ plug-in for Agile-Link ™ supports wireless automatic offset balancing, wireless gain adjustment, and wireless shunt calibration. The Strain Wizard ™ is important for stress analysis because it allows the end user to convert from bits out to physical units of strain.

Performance Specifications: Environmental and phase delay test results of multi-channel Agile-Link ™ wireless sensing nodes combined with conventional piezoresistive foil strain gauges (1000 ohm) are summarized below:

- Sample rates: 1700 samples/sec with one active channel
- Phase delay: 1.5, 3.5, & 5.5 milliseconds for 1, 4 and 8 active channels
- Temperature coefficient offset 0.007%/deg C (tested from +20 to +50 deg C)
- Operating temperature: -20 to +85 deg C
- Programmable full scale range: 1000 to 5000 microstrain
- Resolution: +/-2.5 microstrain (w/ anti-aliasing filter bandwidth 0-500 Hz)
- RF communications band: 902-928 MHz
- Number of distinct RF communications channels: 26
- Serial communications rate: 76.8 kbaud
- Wireless communications range: 150 meters line of sight
- Multi-channel outputs: Digital (RS-232 or USB) & Analog (0-5 volts FS)

Current Applications: Frequency agile strain, acceleration and micro-displacement sensing nodes were used to protect the Liberty Bell during a recent move in October

2003. They're currently deployed on the Ben Franklin Bridge, which spans the Delaware River from Camden NJ to Philadelphia, PA. The ability to collect data from multiple, multi-channel sensing nodes of strain, acceleration and temperature is enabling for many test and measurement applications, which has, in the past, relied heavily on laboratory simulations in order to validate new structural and machine designs. These new frequency agile wireless sensing systems are enabling "real-world" measurements, where designs are tested and validated in the actual operating environment.