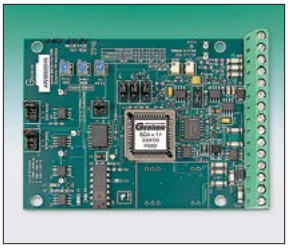
Model 8020-59 Vibrating Wire Frequency to Analog Converter

The Model 8020-59 Vibrating Wire (VW) Frequency to Analog Converter provides a simple way to connect GEOKON vibrating wire transducers to data acquisition systems that are not capable of reading frequency signals nor able to generate the proper signals required to excite VW transducers. The converter can operate as a stand-alone device for single transducers, or in conjunction with the Model 8032 Multiplexer for multiple transducers. The converter is powered using either a 12 V or 24 V supply.

Specifications	
Power Requirements	12 V or 24 V 90 mA @ 12 V *(operation)*, 10 µA *(standby)* 75 mA @ 24 V *(operation)*, 16.5 mA *(standby)*
Operation Modes	Single Channel, 16 VW sensors with thermistors, or 32 VW sensors
Output (Analog)	0-5 V, 4-20 mA *(non-isolated loop generator)*
Resolution	16 bit
Accuracy	±0.1% F.S. *(0-5 V)*, ±0.5% F.S. *(4-20 mA)*
Temperature Range	–20 °C to +80 °C
Dimensions (L × W × H)	111 × 108 × 36 mm *(with cover)*



Model 4500CPR 〉 8020-42CPR Autoresonant Vibrating Wire Sensors

Autoresonant Vibrating Wire Sensors expand the possibilities of dynamic monitoring while retaining the inherent long-term stability of the GEOKON line of vibrating wire instruments. GEOKON offers three types of autoresonant sensor: One uses a custom sensor and an electronic adaptor (Model 4500CPR), another uses the standard vibrating wire sensor and an electronic adaptor (Model 8020-42CPR) and the third type is a custom sensor with internal electronics (see the Model 4500AR Autoresonant Piezometer, page 9).

Specifications	4500CPR	8020-42CPR
Input	±12 VDC at 50 mA *(max)*	±12 VDC at 50 mA *(max)*
Output	4-20 mA; Frequency[1] *(100 Hz dynamic range)*	4-20 mA; Frequency *(20 Hz dynamic range)*
Temperature Range	0 °C to +40 °C	0 °C to +70 °C

[1]*Open collector output: requires external pull-up termination resistor.*

Model 8002 (LC-2) Series Dataloggers

The Model 8002-1 (LC-2) and Model 8002-1A (LC-2A) are stand-alone, single-channel dataloggers, designed to read both the vibrating wire element and the integral thermistor of any GEOKON vibrating wire sensor. The Model 8002-4 (LC-2×4) provides 4 channels of vibrating wire (with thermistor). The Model 8002-16 (LC-2×16) is similar to the LC-2×4, but provides 16 channels of vibrating wire (with thermistor). The dataloggers are housed inside Fiberglass NEMA 4X enclosures, suitable for operation in harsh environments. Power is provided via alkaline D cells or an optional external 12 V source.

Specifications	
Measurement Accuracy	±0.05% F.S. *(450-4000 Hz)*
Measurement Resolution	1 part in 20,000
Program Memory	24K FLASH
Data Memory	320K EEPROM
Temperature Range	–30 °C to +50 °C
Dimensions (L × W × H)	122 × 120 × 91 mm *(LC-2(A))* 260 × 160 × 91 mm *(LC-2×4)* 342 × 301 × 160 mm *(LC-2×16)*[1]

[1]*Does not include mounting feet.*

Model 8003 (LC-3) Series MEMS Dataloggers

The Model 8003 Series LC-3 MEMS Dataloggers are designed to read MEMS sensors and their integral thermistors. The 8003A and 8003B are standalone dataloggers to which external MEMS sensors are connected via cables, while the 8003C and 8003D are dataloggers containing integral MEMS sensors. The Model 8003 Series LC-3 MEMS Dataloggers are powered by three, easily accessible, alkaline D cells, or by an optional 12 V source. A solar panel and rechargeable batteries can also be used.

Specifications	
Accuracy	±0.05% F.S.
Resolution	18 bit
Storage Capacity (Arrays)	21,000
Temperature Range	–30 °C to +50 °C
Temperature Measurement	1.0% F.S. *(accuracy)*; 0.1 °C *(resolution)*
Scan Interval	5-86,400 seconds *(24 hours)*
Dimensions (L × W × H)	122 × 120 × 81 mm *(8003A/B)* 120 × 220 × 90 mm[1] *(8003C/D)*

[1]*Mounting Panel: 276 × 133 × 6 mm*

Model 8001-3 LogView 〉 8001-10 LogView Mobile Software

LogView Software simplifies the task of configuration, communication, monitoring, data collection and data reduction when using LC-2 and LC-3 Series Dataloggers. The software is an easy-to-use, menu-based application, and includes screens for configuration, connection, measurement and data collection, plus a real-time text-based monitor, graphical monitor and terminal emulator. LogView Mobile performs most of the same functions as LogView but was designed to operate on a ruggedized, handheld PC, such as the Model FPC-2.

System Requirements	
Operating Systems	**Windows®** 7, Vista, XP Pro, XP *(LogView)* **Windows®** Mobile 6.1 or greater *(LogView Mobile)*
.NET Frameworks	**Microsoft®** Compact Framework 3.5 *(LogView Mobile)*
System Requirements (Minimum)	**Pentium®** IV (or equivalent) running at 500 MHz; 64 MB RAM; 20 MB Hard Disk[1] *(LogView)*
Storage Memory	10 MB free *(minimum)*, 20 MB free *(recommended)* *(LogView Mobile)*
Program Memory	5 MB free *(minimum)*, 10 MB free *(recommended)* *(LogView Mobile)*

[1]*Space required for LogView software installation and log files only. Additional space is required to accommodate data files.*

Model 8600 Series Dataloggers

The Model 8600 Series Dataloggers are designed around the Campbell Scientific, Inc. Model CR6 Measurement and Control Module. Manufactured primarily for use with vibrating wire sensors and thermistors, the Model 8600 Series can also be configured to read MEMS, Carlson, voltage, 4-20 ma, and numerous other specialty sensor types. The Model 8600-1 and 8600-2 Dataloggers are housed in a NEMA 4X fiberglass reinforced polyester enclosure. The Model 8600-3 Datalogger is housed in a rugged, water-resistant PVC enclosure together with an integral Spread Spectrum Radio (for wireless data transmission).

Specifications (Excitation Outputs)	
Resolution	50 nV (±200 mV range, differential measurement, input reversal, 5 Hz f_{N1}) *(analog);* 0.001 Hz RMS *(frequency)*
Accuracy	±(0.04% of reading + 2 microvolts), 0-40 °C *(analog);* ±0.013% of reading *(vibrating wire)*
Battery	12 V, 7 Ah Gel Cell *(8600-1/2)* 4 × D-cell (Li 8.5 Ah) *(8600-3)*
Temperature Range	–40 °C to +70 °C
Dimensions (L × W × H)[1]	392 × 352 × 161 mm *(8600-1);* 502 × 461 × 263 mm *(8600-2);* please consult **GEOKON** *(8600-3)*

[1]*Does not include mounting feet.*

Model 8026 Wireless Datalogger

The Model 8026 is designed around the Campbell Scientific, Inc. Model CR800 datalogger to read GEOKON Vibrating Wire sensors. It's housed in a rugged, water-resistant PVC enclosure (optional stainless steel and waterproof enclosures available) together with a battery pack and a RF modem (for wireless data transmission). It's configured to read 6 sensors; either 6 VW or 3 VW plus 3 thermistors, or any combination thereof. A Spread Spectrum Radio Modem and Antenna are typically installed with the 8026.

Specifications (Excitation Outputs)	
Range	±2.5 millivolts to ±5 volts *(analog);* DC to 200 kHz *(frequency)*
Resolution	0.33 microvolts to 1333 microvolts *(analog);* ±35 nS/number of cycles measured *(frequency)*
Accuracy	±0.12% F.S. of reading, plus offset *(analog);* ±0.01% of reading, plus resolution *(frequency)*
Excitation Output	±2.5 V at 25 mA *(maximum)*
Battery	4 × D cell Lithium 8.5 Ah
Temperature Range	–25 °C to +50 °C *(–55 °C to +80 °C optional)*
Dimensions (H × ø)	381 × 168 mm

Model 8032 Multiplexer (MUX)

The Model 8032 Multiplexer expands the number of channels that can be read by the 8600 Series Dataloggers or GK-404/GK-405 Vibrating Wire Readout. The channels are protected against voltage surges with tripolar plasma surge arrestors and bipolar surge arrestors. Optional manual switches may be connected to allow manual measurements with a portable readout in tandem with those taken automatically with the datalogger.

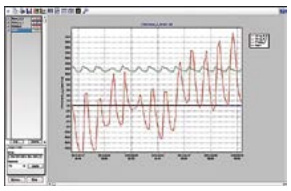
Specifications	
Switching Current	1 A *(maximum)*
Contact Resistance	0.1 Ω *(maximum)*
Insulation Resistance	> 1 GΩ
Switch Life	> 200,000 cycles
Enclosure	NEMA 4X fiberglass
Temperature Range	–40 °C to +60 °C
Dimensions (L × W × H)[1]	342 × 301 × 160 mm

[1]*Does not include mounting feet.*

Model 8040 Series Wireless Vibrating Wire Interface

The Model 8040 Series is designed to expand the data collection possibilities of the Model 8600 Series Dataloggers via wireless connectivity, which eliminates the need for running lengthy cables. Available for 2, 4 or 16 sensors (VW plus thermistor), the 8040 Series comprises Campbell Scientific's AVW206 (or AVW216) spectrum analyzer (with built-in 900 Hz or 2.4 GHz radio transmitter), power supply and antenna. It's housed in a rugged NEMA 4X enclosure designed for use in harsh environments.

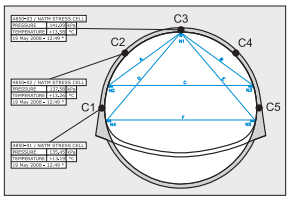
Specifications	
Input Range	100 to 6500 Hz *(vibrating wire);* ±2500 mV *(thermistor)*
Resolution	0.001 Hz RMS *(vibrating wire);* 0.001 Ω RMS *(thermistor)*
Accuracy	±0.013% of reading *(vibrating wire);* ±0.25% of reading *(thermistor)*
Wireless Transmission Range	up to 10 miles *(when using a higher gain directional antenna, under ideal conditions)*
Battery	12 V, 7 Ah Gel Cell
Temperature Range	–25 °C to +50 °C *(–55 °C to +80 °C optional)*
Dimensions (L × W × H)	varies by model *(please contact **GEOKON**)*



LoggerNet Datalogger Software

LoggerNet Datalogger Software supports programming, communication, and data retrieval between the CSI based GEOKON dataloggers and a PC. It includes tools for network setup, configuration, monitoring, and backup; datalogger programming, maintenance, and data collection; and real-time or historical data display.

System Requirements	
Operating Systems	**Windows®** 10, 8 and 7 *(32 and 64 bit versions)*
Minimum Requirements	**Windows®** 7 running on an **Intel®**-based PC



VDV Vista Data Visualization Software

Vista Data Vision (VDV) is a hosted software package which organizes and displays data collected from almost any datalogger system including GEOKON Model 8600 and 8002 Series Dataloggers for viewing over the Internet via all major web browsers. Users can view and display data from multiple sensors in graphical format, which makes it possible to identify max, min and average for any period of time. Data can also be viewed as a table and downloaded into a .txt file.

Hosting Service Configuration[1]
Graph per sensor or per group of sensors
Alarm for low battery voltage and for missing data collection
Scaling of sensor readings
Cumulative displacement graphs for In Place Inclinometers
Real-Time Displays (RTD) showing latest data, per location with background image
Alarm thresholds
3 usernames and passwords for access to the web based data hosting service

[1]*Please contact **GEOKON** for further details and hosting packages.*

Model 8800 Series GeoNet Wireless Network

GeoNet is a low-power, wireless data acquisition network developed to more efficiently collect data from many points. The system consists of a Network Supervisor (8800-2), which controls the network, and up to 100 Single-Channel Sensor Nodes (8800-1). The system is compatible with all GEOKON Vibrating Wire instruments. GeoNet is built on top of the IEEE 802.15.4 standard. The network is self-healing and will reconfigure itself, if possible, to tolerate disturbances in the physical environment. Up to 12 networks can coexist in the same area by setting each to a different operating frequency (channel). A Cellular Modem (8800-2-4A) and Network Serial Server (8800-2-4B) option are available for the GeoNet Network Supervisor, both of which are housed in a rugged, RFI shielded fiberglass enclosure.

Specifications

Measurement Accuracy	±0.025% F.S. *(400-5000 Hz)*
Radio Frequency, ISM Band	900 MHz[1]; 2.4 GHz[2]
Range[3] (Outdoor)	26 km *(6500 m × 4 hops)*[1]; 3 km *(750 m × 4 hops)*[2]
Range[3] (Indoor, Urban)	1220 m *(305 m × 4 hops)*[1]; 240 m *(60 m × 4 hops)*[2]
Data Memory	32 MB
Storage Capacity	>1.04 M Arrays
Power Supply	D Cell Alkaline or Lithium *(2×)*
Operating Temperature	–40 °C to +85 °C
Dimensions (L × W × H)	122 × 120 × 91 mm

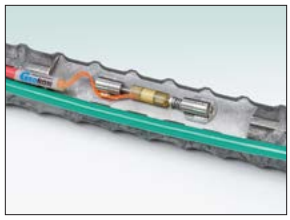
[1]North America, Brazil, Singapore, Australia. | [2]Other countries. | [3]Line-of-sight, maximum 4 hops.

Model 8800 Series GeoNet Multiplexers

GeoNet Multiplexers expand the capacity of each Model 8800-1 Sensor Node to 8 channels, thereby allowing clusters of closely spaced sensors to be added to the system, or to add vibrating wire load cells (which contain between 3-6 sensors), multipoint borehole extensometers (which contain between 3-8 sensors) or multilevel piezometers. Sensor cables are connected to the multiplexer through cable glands (Model 8800-8-1, 8800-8-3) or via 10-pin connectors (Model 8800-8-2). Multiplexers are connected to the nodes via a 3 m interconnect cable (with a 10-pin connector at each end) and are supplied with mounting brackets for attaching to poles or backboards as required.

Specifications

Supply Voltage (Nominal)	2.8 V - 3.6 V *(3.3 V)*
Quiescent Current (Typical)	50 µA
On–state Current (Typical)	10 mA *(varies with temperature)*
Switch Resistance (Max)	10 Ω added in series to each VW coil
Datalogger Cable	3 m
Dimensions (L × W × H)	260 × 160 × 91 mm *(8800-8-1/3)* 360 × 160 × 91 mm *(8800-8-2)*

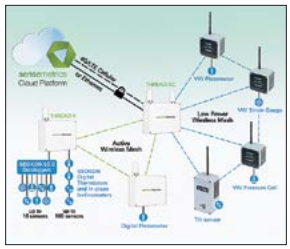


Model 8020-30 Addressable Vibrating Wire Interface

The Model 8020-30 Addressable Interface is designed to "daisy-chain" up to 100 vibrating wire sensors on a single 4-conductor cable. It is particularly useful for reducing cable runs in multipoint systems, incremental extensometers, and for applications where many sensor cables might compromise a grout or cement bond. The system features state of the art signal conditioning and digital addressing. (Please contact GEOKON for more information). Readout is achieved with the FPC-2 Field PC, 8600 Series Dataloggers or via a PC application.

Specifications

Range	400 Hz to 5000 Hz
Accuracy	0.005%
Resolution	better than 0.005 Hz
Sweep/Read Duration	< 500 ms
Communication	**Modbus®** RTU over RS-485 @ 9600 baud
Temperature Range	–40 °C to +70 °C



sensemetrics Integration

The sensemetrics software platform provides an advanced suite of connectivity and data management tools for distributed sensor networks. The platform is built around THREADS, which are known for their wide range of sensor support and ease of installation. These "smart" devices, integrated with GEOKON 8002 (LC-2) Series Dataloggers, GeoNet Wireless Network, Addressable VW Interfaces, Thermistor Strings and MEMS IPIs, greatly expand the ways in which data can be collected remotely. In addition, they feature "plug and play" connectivity and the ability to display data in real-time, on a user-friendly, cloud-hosted, browser-based data platform.

System Requirements

Minimum Requirements	Internet browser only (**Chrome™** or **Firefox™**)
Operating Systems	Not applicable
Database Requirements	Not applicable