# Vibrating Wire Readout Box

## Applications

The Model GK-403 Vibrating Wire Readout Box can be used with all of Geokon's vibrating wire sensors. The rugged and reliable, user friendly GK-403 provides the following...

- Easy-to-use control panel
- Multi-line LCD
- RS-232 communications port
- Internal real-time clock
- Temperature readout
- Battery-backed memory
- Rechargeable battery
- Two modes of data acquisition
- Data storage capability
- Cold weather operation


*Close-up of Model GK-403 Vibrating Wire Readout Box control panel.*

## Operating Principle

The Model GK-403 Vibrating Wire Readout Box is designed for use with all of Geokon's vibrating wire sensors in all kinds of weather conditions.

The Model GK-403 works on the "pluck and read" principle in which a swept-wave spectrum of frequencies is transmitted to the electronic plucking coil in the sensor which starts the wire vibrating at its resonant frequency. Some milliseconds later the plucking coil, in conjunction with a permanent magnet, becomes a sensing coil and transmits a sinusoidal output voltage, having the same frequency as the vibrating wire, back to the readout box. Here the frequency is measured very accurately by means of a high precision digital quartz crystal oscillator. The measured frequency is squared to linearize the output and displayed on a LCD readout panel. The Model GK-403 can also read the thermistors included with most Geokon vibrating wire sensors, and display the temperature directly in degrees Centigrade.

Storage of the readings is a simple one-button operation and each stored reading is identified by a reference number, ranging from 1 to 256, plus time, date and temperature. All readings can be downloaded to a host computer and imported into spreadsheet and database applications such as Microsoft® Excel, etc.

● *Model GK-403 VW Readout Box.*

## Advantages and Limitations

The Display Switch on the front panel provides a variety of readout options:

Channel A – Period of vibration in micro seconds.

Channel B – Frequency squared x 10–3

Channel C – Micro-strain when used with Model 4000 strain gages.

Channel D – Micro-strain when used with Model 4200 strain gages.

Channel E – Micro-strain when used with Model 4100 and 4150 strain gages.

Channel F – Frequency squared x 10–3 when used with vibrating wire sensors requiring high frequency excitation.

Channel G – Programmable mode. Permits programming of readout box to display the sensor output in engineering units. This can be done by manipulation of the front panel joysticks or by connecting to a computer using the RS-232 cable supplied. In addition, identifiers for up to 252 sensors can be programmed. A two dimensional storage matrix of rows and columns is provided to allow storage of sets of readings from many instruments. Readings taken at a particular time are displayed in the rows, and sequential readings of a particular sensor are displayed in the columns. An easy-to-use menu lists options to transmit readings, clear stored readings, set the date and/or time or set sensor parameters.

An automatic shut off after 4 minutes is provided to preserve battery life. The front panel incorporates watertight seals for all-weather operation. An audio option is also available which allows the sensor output signal to be evaluated for strength and quality. (Contact Geokon for details).

*Please note that the Model GK-403 is not suitable for the measurement of rapidly changing phenomena.*

## System Components

The Model GK-403 is supplied complete with a battery charger, patch cord, RS-232 interface cable, communications software and manual. Switch boxes and multiplexers are also available, to which several vibrating wire sensor cables can be connected, allowing many sensors to be read conveniently and rapidly by the Model GK-403.

## Technical Specifications

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|---|---|
| **▼ Vibrating Wire Readout** | |
| Excitation Range | 400 Hz to 6000 Hz, 5 Volt Square Wave |
| Resolution | 0.1 µs |
| Timebase Accuracy | ±50 ppm |
| **▼ Temperature Readout** | |
| Sensor Type | Thermistor, Dale #1C3001-B3 (YSI 44005) |
| Sensor Accuracy | ±0.5°C |
| Range | –50°C to +150°C |
| Resolution | 0.1°C |
| Accuracy | 0.5% to 1.0% F.S. |
| **▼ Memory** | |
| RAM | 64K static, 48K used |
| ROM | 32K EPROM, 16K used |
| Reading Storage | 2000 arrays |
| Array Partition | 256 arrays for Modes A-F, 464 for Mode G |
| **▼ Real-Time Clock** | |
| Features | Full calendar w/auto leap year correction |
| Time Format | 24 hour (HHMM) |
| Date Storage Format | Julian day |
| Date Display Format | Month/Day/Year (MM/DD/YY) |
| Accuracy | ±1 minute per month |
| **▼ Communications** | |
| Default Parameters | 9600 baud, 8 data bits, 1 stop bit, no parity |
| Handshake | XON / XOFF |
| Transmission Format | Comma-delineated ASCII |
| **▼ Physical** | |
| Display | 15 column x 8 line backlit LCD |
| Temperature Range | –10°C to +50°C |
| Battery | 12 Volt 2.6 aHr (Yussa NP2.6-12) |
| Operating Time | 10 hours @ 25°C (approximately) |
| Weight | 3.2 kg |
| L × W × H | 191 × 133 × 235 mm |



GEOKON

*The World Leader in Vibrating Wire Technology™*

*Geokon, Incorporated*
*48 Spencer Street*
*Lebanon, NH 03766*
*USA*

*1 • 603 • 448 • 1562*
*1 • 603 • 448 • 3216*
*geokon@geokon.com*
*www.geokon.com*