Vibrating Wire Readout

Applications

The Model GK-405 Vibrating Wire Readout can be used with all Geokon vibrating wire sensors. The rugged and reliable, user-friendly GK-405 provides the following…

- **Integrated Handheld Field PC**

- **Bluetooth® communication between Field PC and Dock**

- **Real-time datalogging**

- **Two modes of data acquisition**

- **Data and configuration storage on internal 4 GB Solid State Drive**

- **Rechargeable Li-ion battery**

- **Cold weather operation**

● *Model GK-405, shown with Model 4900 Vibrating Wire Load Cell, with Handheld Field PC removed from the Dock.*

● *Close-up of Model GK-405 Vibrating Wire Readout and NAUTIZ X7 Handheld Field PC placed in dock.*

Operating Principle

The Model GK-405 Vibrating Wire Readout is designed for use with all of Geokon's vibrating wire sensors, in all kinds of weather conditions.

The Model GK-405 works on the "pluck and read" principle in which a swept wave frequency spectrum is transmitted to the electronic plucking coil in the sensor, which starts the wire vibrating at its resonant frequency. 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. 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 display is accomplished via Bluetooth® transmission to the Handheld Field PC running the GK-405 application. The Model GK-405 can also read the thermistors included with most Geokon vibrating wire sensors, and display the temperature directly in degrees Centigrade on the Handheld Field PC.

Storage of the readings is a simple one-button operation and each stored reading is identified by an array reference number, plus time, date and temperature. All readings can be exported to a number of different file formats. Syncing to a host computer is simple and straightforward, allowing project folders and data files to be easily saved.

● Model GK-405 VW Readout Dock, shown with the compatible Model GK-604-6 Inclinometer Field PC.
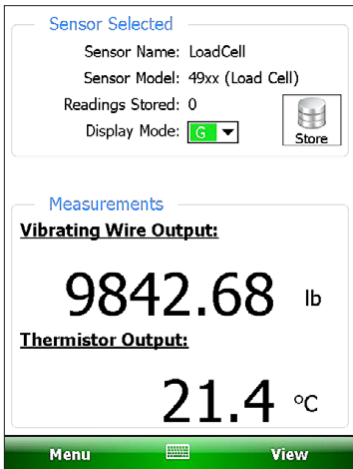
● Live Readings screen shot, displaying vibrating wire load cell data.

Advantages and Limitations

The Display Mode Control on the Live Reading Screen provides a variety of readout options: Period of vibration in micro seconds, Frequency squared × 10^{-3} (digits) and Micro-strain when used with strain gages. In addition, a Programmable Mode permits programming to display the sensor output in engineering units, via configurations created and edited in the Sensor Selection Screen. Thousands of sensors may be defined, limited only by the storage remaining on the SSD. Data is logged and stored on a per-sensor basis.

The GK-405 is available with or without the Handheld Field PC, because the Model GK-604-6 Field PC, provided with Geokon's Model GK-604 and GK-604D Inclinometer Readout, is compatible with both systems.

System Components

The Model GK-405 is supplied complete with a battery charger, 10-pin plug to flying leads patch cord and manual. Terminal Boxes are also available, which allow a multiplicity of vibrating wire sensors to be read quickly and conveniently, at one location.

Technical Specifications

GK-405 (Remote Module)

▼ Vibrating Wire Readout

Excitation Range	450 Hz to 6000 Hz, 5 volt square wave
Resolution	0.001 Hz
Timebase Accuracy	±0.2 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.

▼ Communications

Wireless Protocol	Bluetooth,® 2.0 +EDR, Class 1, range 20 m
Bluetooth® Profile	Serial Port Profile (SPP)
Parameters	9600 baud, 8 data bits, 1 stop bit, no parity, full duplex, non-configurable
Transmission Format	ASCII

▼ Physical

Temperature Range	−10°C to +50°C
Battery	7.4 Volt, 2600 mAHr Li-ion
Operating Time	greater than 40 hours
Weight	2.45 kg
L × W × H	210 × 165 × 185 mm

Handheld Field PC

▼ NAUTIZ X7

Operating Temperature	−30 °C to 60 °C
Storage Temperature	−40 °C to 70 °C
Processor	Marvell PXA310 806 MHz
Memory	128 MB SDRAM
Data Storage	4 GB iNAND Flash
Operating System	Microsoft Windows® Mobile 6.1
Screen	480 × 640 pixel Anti-glare 3.5" VGA resolution, touchscreen, sunlight readable 262K colors (18 bit), with LED backlight
Keypad	Numeric keypad with backlighting, on-screen QWERTY keyboard
Battery	5600 mAh Li-ion battery pack
Connections	1 × USB host and client (Mini AB USB OTG, 1.2 host, 2.0 client), Power jack, 1 × SDIO slot, 9-pin serial RS-232 connector
Communication	PAN: Bluetooth® 2.0 +EDR, WLAN: Integrated 802.11 b/g supports AES, TKIP, WEP, WPA and WPA2, GSM/UMTS (HSDPA/EDGE)
Navigation	Integrated GPS SiRF Star III chipset with WAAS/EGNOS support, Integrated E-Compass and G-Sensor, Integrated Altimeter
Camera	Integrated 3 megapixel camera with autofocus and LED Flash
Weight	490 g, including rechargeable battery
L × W × H	179 × 97 × 37 mm

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