Vibrating Wire Spectral Analysis Technology

VSPECT
The only solution for vibrating-wire measurements

- Eliminate noise spikes, false alarms
- Patented spectral analysis
- Have confidence in your measurements
Vibrating Wire
Spectral Analysis Technology

VSPECT* is an innovative, patented technology that delivers the best measurement for vibrating wire sensors. VSPECT observes the incoming sensor signal, performs a Fourier transform and spectral analysis (transforming the Time Series into individual sinusoidal components in the Frequency Spectrum). The frequency is determined by identifying the largest signal in the acceptable range and disregarding unwanted noise.

**VSPECT Outputs**
- **Sensor Frequency** (frequency of peak response)
- **Amplitude** (signal strength)
- **Signal-to-Noise Ratio** (measurement quality)
- **Noise Frequency** (largest observed noise)
- **Decay Ratio** (signal attenuation)
- **Thermistor, if present** (Ohms or temperature)

![Frequency Spectrum](image)

VSPECT technology determines the sensor frequency from the Frequency Spectrum while ignoring noise signals.

![Time Series](image)

Traditional vibrating-wire readers determine the sensor frequency from the Time Series where signal and noise can’t be distinguished.

### CR6 Measurement and Control Vibrating-Wire Datalogger

The CR6 measurement and control datalogger revolutionizes data acquisition systems. It is a smaller, faster, lighter, and more powerful than our previous systems with 24-bit resolution and VSPECT vibrating-wire analysis. The CR6 has what it takes to be the core of any system.

**Benefits and Features**
- Onboard VSPECT vibrating wire measurements
- Supports dynamic vibrating wire measurements with CDM-VW300 series
- Cost effective
- U-terminal configurable to what you need: analog or digital, input or output
- Integrated charge regulator
- Ethernet 10/100
- MicroSD card slot
- Removable terminal blocks
- Multiplexer expandable
- CRBasic Programmable
- Wi-Fi and RF options coming soon (2015)

*The VSPECT technology is protected under U.S. Patent No. 7,779,690.*

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[Campbell Scientific](campbellsci.com/vibrating-wire-interfaces)

**Questions & Quotes:** 435.227.9120
**CRVW3** 3-Channel Vibrating Wire Datalogger

The CRVW3 is a self-contained, low cost 3-channel VSPECT vibrating-wire datalogger. It is designed to be an independent datalogger, or a reliable component in a larger data acquisition system. Arriving field ready from the factory with power, communications, and an enclosure, the CRVW3 is ready for your monitoring needs.

**Benefits and Features**
- Complete data acquisition system in a single product
- 3-channel vibrating wire datalogger
- Wireless routing communications with integrated radio options
- Charge regulator for easy solar panel connection
- Enclosure rated to IP66
- Software configurable; no programming required
- Rechargeable and alkaline battery options
- PakBus router/radio repeater capabilities
- Compatible with current Campbell Scientific datalogger networks

**AVW-HANDHELD** Vibrating Wire Analyzer

Campbell Scientific’s Handheld Vibrating Wire Analyzer brings new capabilities to VSPECT technology. With built-in graphical display, you can see and understand how the sensor is working, troubleshoot sensor installation in the field, and get real time results of system performance. With our PDF document generator, the Handheld Vibrating Wire Analyzer lets anyone create as-built printed or electronic documentation of installation or traditional field visits.

**Benefits and Features**
- Generates field calibration sheet and installation record
- Works with all vibrating wire gages
- Graphical display of VSPECT vibrating wire measurements
- Sensor troubleshooting
- Integrated GPS, takes you to the sensor location
- Reports measurement frequency, quality and competing noise
- Geolocates stored readings
- Field replaceable batteries
- Field ready
Comparison Table

<table>
<thead>
<tr>
<th>Model</th>
<th>Solutions</th>
<th>USB Configuration</th>
<th>Ethernet</th>
<th>Expandable Memory</th>
<th>Wireless Communications</th>
<th>Channel Count</th>
<th>Multiplexer Capable</th>
<th>Static VW</th>
<th>Dynamic VW</th>
<th>GPS</th>
<th>Power Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR6</td>
<td>Fully functional datalogger with onboard vibrating-wire measurements</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Wi-Fi and radio options available soon</td>
<td>12 universal</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>12 to 32 Vdc</td>
</tr>
<tr>
<td>CRVW</td>
<td>3-channel stand-alone vibrating-wire datalogger</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>Radio options</td>
<td>3 vibrating wire</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>12 to 28 Vdc</td>
</tr>
<tr>
<td>AVW Handheld</td>
<td>Handheld diagnostics and report generation</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>1 vibrating wire</td>
<td>✓</td>
<td>✓</td>
<td>5 AA batteries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDM-VW300 Series</td>
<td>Dynamic vibrating-wire analyzer</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>2 or 8 vibrating wire (depends on the model)</td>
<td>Other CDMs</td>
<td>✓</td>
<td>✓</td>
<td>9.6 to 52 Vdc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVW200 Series</td>
<td>Vibrating-wire analyzer</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>2 vibrating wire</td>
<td>✓</td>
<td>✓</td>
<td>12 Vdc</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The CDM-VW305 is an 8-channel VSPECT vibrating wire module that allows high speed simultaneous vibrating wire measurements with traditional vibrating wire gages. Several CDM-VW305 modules can be connected to a single CR6 datalogger for a large channel count system; modules can be strategically located near sensors reducing cabling and installation costs without compromising measurement quality. Also available is a 2-channel model (CDM-VW300). U.S. Patent No. 8,671,758.

**Benefits and Features**

- Revolutionary VSPECT dynamic vibrating wire measurements
- 8-channels with 1 to 333 Hz measurement speed
- Simultaneous measurements
- Use traditional vibrating wire sensors
- Replace eight sensor cables with a single CAT5e cable
- Retrofit existing installations with dynamic capabilities

The AVW200-series interfaces are the proven standard for vibrating measurements with over 10,000 installations worldwide. They allow traditional dataloggers (CR800, CR850, CR1000, and CR3000) to use the VSPECT technology for the best vibrating wire measurement possible since 2007.

**Benefits and Features**

- 2 channels for static vibrating measurements
- Multiplexer expandable channels
- Patented VSPECT technology
- Wireless communication options