CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

VwAnalyzer

Vibrating Wire Analyzer

VWANALYZER
VIBRATING WIRE ANALYZER

VSPECT POWERED

Overview

Campbell Scientific's VWANALYZER is the best vibrating-wire field reader available. This vibrating-wire analyzer (VWA) is field ready to quickly measure a sensor, save data, and communicate results with custom PDF reports and spreadsheet output. Measurements are geo-located with the integrated GPS allowing the VWA to verify locations and direct you to your sensors. The large color display and VSPECT technology create confidence both in the field and office that you are getting the best measurement possible—VWANALYZER when your measurements matter.

Benefits and Features

- Create custom PDF reports
- Confidence in your measurement with graphical display and VSPECT
- Full color screen and easy to use menus
- Integrated GPS records sensor location
- Read any vibrating wire sensor
- Sensor library contains common vibrating wire sensors
- Transfer PDF and CSV files quickly with the USB connection

Specifications

Vibrating-Wire Measurement

- Resolution: 0.001 Hz RMS
- Speed: 1 s (fastest)
- Excitation: 2 V, 5 V, 12 V (user-selectable)
- Accuracy: ±0.005% of reading
- Method: VSPECT (Vibrating Wire Spectral Analysis), U.S. Patent No. 7,779,690

Temperature Measurement (resistance)

- Resolution: 0.01 Ω RMS
- Accuracy: ±0.15% of reading

General

- Memory[a]: 1,700 site/sensor measurements (most recent[b])
  40 unique sites, 22 sensors per site
  240 single measurements (most recent[b])
  16,500 continuous measurements (most recent[b])
  80 MB USB memory (PDF, CSV, VWA, and other files[c])
- GPS: ±5 m (16.4 ft) typical; ±1 ms time sync
- Battery type/life: 5 AA (1.5 V)/20 hours continuous use
- Weight: 0.34 kg (0.75 lb)
- Dimensions: 200 x 100 x 58 mm (7.9 x 3.9 x 2.3 in)
- Operating Temperature: -20° to 70°C
- Enclosure: IP62
- USB: Micro-USB B connection, behaves like an external memory drive when connected to a computer
- View EU Declaration of Conformity at: www.campbellsci.com/vwanalyzer

[a] *Non-volatile memory stores data, reports, and project files.*
[b] *When memory is full, new data overwrites the oldest data.*
[c] *Users need to delete/transfer files when memory is full.*

What is a VSPECT Measurement

VSPECT provides the best vibrating wire measurement available. A sensor frequency is easily identified while filtering out environmental and electrical noise that affects the quality of other vibrating wire readers. VSPECT provides measurement diagnostics to understand sensor response, installation quality, and identify incorrect wiring or damaged sensors.

Output and Diagnostics

- **Sensor Frequency[d] (Hz):** Basic measurement from a vibrating wire sensor. The frequency can be converted into engineering units (e.g., pressure, displacement) and is the largest measured amplitude signal within the frequency sweep.
- **Sensor Amplitude[e] (mV RMS):** Signal strength from the vibrating wire sensor. Amplitude varies and is affected by the sensor type, excitation strength (adjustable), and sensor cable length.
- **Signal-to-Noise Ratio[e] (unitless):** Sensor signal amplitude divided by the largest noise amplitude within the sweep frequency. A low signal-to-noise ratio indicates a weak sensor signal or a noisy environment.
- **Noise Frequency[e] (Hz):** Largest amplitude noise signal within the frequency sweep.
- **Decay Ratio[e]:** Signal attenuation (how quickly the signal strength decreases).
- **Thermistor/RTD Resistance[d] (Ω):** Measurement used to calculate sensor temperature and correct for thermal effects[f].

[d] Frequency and resistance are measured values.
[e] Diagnostic values describe the quality of the frequency measurement.
[f] VWA measures the vibrating-wire sensor temperature (when present); thermal and barometric corrections require post processing.

Measurement Graphs

The following graphs show the benefits of measuring with VSPECT using the same sensor in two different measurement environments. Figure 1 shows a sensor measured in an electrically quiet environment; Figure 2 used the same sensor in an electrically noisy environment (ac power) similar to field conditions (power lines, motors, radio signals). In Figure 1, the time series (4) provides a clean signal that is more clearly identified (2) with the frequency spectrum (1). The time series (8) in Figure 2 shows the influence of the noise (9). Vibrating wire readers that only use the time series (3) report the wrong frequency because of the noise. VSPECT technology filters the noise (6) and easily identifies the sensor signal (7).

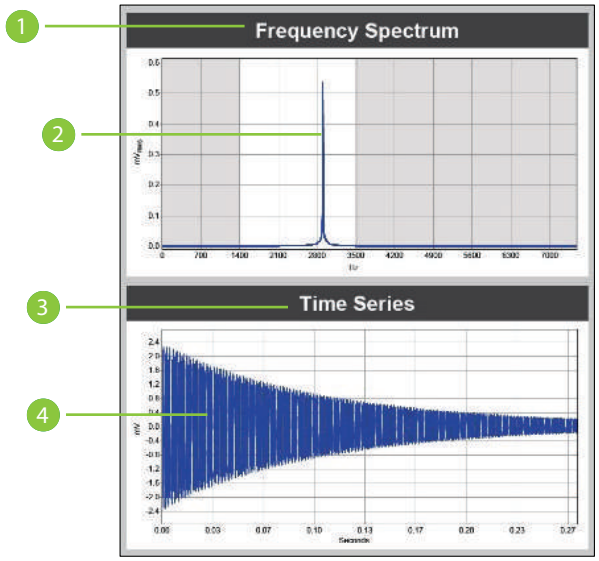

Figure 1. Vibrating-Wire Signal in Quiet Environment.

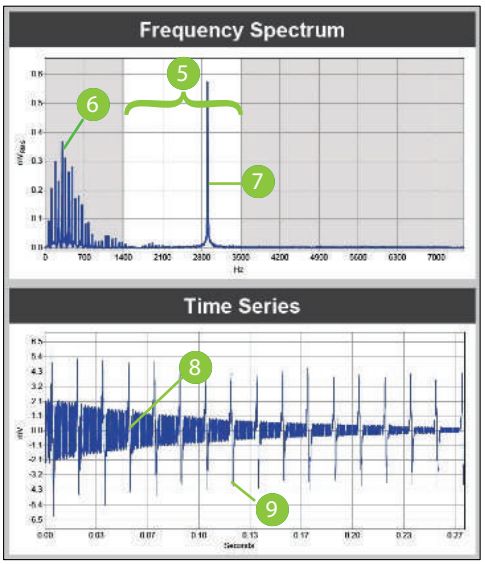

Figure 2. Vibrating-Wire Signal in Noisy Environment.

1. Frequency-spectrum (VSPECT) graph (signals with respect to frequency)
2. Sensor signal determined as the largest signal within the frequency sweep
3. Time-series graph (raw signals observed with respect to time)
4. Time series with minimal noise influence
5. Frequency sweep (white area in graph). Only signals within the frequency sweep are considered as a possible sensor signal
6. Noise identified and ignored
7. Sensor signal easily identified even when noise is in measurement
8. Time series with observable noise
9. Noise in time series (what messes up non-VSPECT devices)

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