CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

AVW216

2.4 GHz Wireless 2-Channel Vibrating-Wire Analyzer Module

Greatly Reduces Signal Noise

Includes built-in radio

Overview

The AVW216 is a vibrating-wire analyzer module that includes an internal 2.4 GHz spread-spectrum radio for wireless communication in many countries worldwide. With this vibrating-wire analyzer module, your data logger can measure vibrating-wire strain gages, pressure transducers, piezometers, tiltmeters, crackmeters, and load cells. These sensors are used in a wide variety of structural, hydrological, and geotechnical applications because of their stability, accuracy, and durability.

Benefits and Features

- Provides better measurements by significantly reducing incorrect readings caused by noise sources
- Interfaces two vibrating-wire sensors; more sensors may be connected if an AM16/32B multiplexer is used
- Self-checking diagnostics give continual feedback on sensor condition
- High resolution—less than 0.001 Hz (industry standard is 0.1 Hz)
- Low current drain
- Remote, wireless operation with on-board radio
- Interfaces both temperature and frequency measurements from vibrating-wire sensors

Detailed Description

The AVW216 uses vibrating-wire spectral-analysis technology (VSPECT®). VSPECT® observes the incoming sensor signal, performs a Fourier transform and a spectral analysis (transforming the time series into individual sinusoidal components in the frequency spectrum), and determines the sensor frequency by identifying the largest signal in the acceptable range while filtering out environmental and electrical noise.

The AVW216 analyzer module also provides many self-checking diagnostics such as vibrating-element signal strength, signal-to-noise ratio, vibrating-element signal decay ratio, and incorrect signal response. These diagnostics can be running in the background to give continual feedback of the condition for each sensor.

The AVW216 typically transmits its data to an RF416 spread-spectrum radio that is connected to the data logger. The AVW216 can also be connected directly to the data logger.

Specifications

-NOTE-	*Electrical specifications are valid over a -25° to +50°C range unless otherwise specified. Non-condensing environment required.*
Operating Temperature Range	-25° to +50°C
Internal Radio Frequency Range	2.450 to 2.482 GHz
Radio Power	50 mW
Number of Vibrating-Wire Sensors Measured	Up to 2 vibrating-wire sensors can be connected to the analyzer module. Additional sensors can be measured by using an AM16/32-series multiplexer.
Power Requirements	9.6 to 16 Vdc
Analog Input/Outputs	2 differential (DF) vibrating-wire measurements (V+ and V-) and 2 single-ended (SE) ratiometric resistive half-bridge measurements (T+ and T-) for vibrating-wire sensor's onboard temperature sensor.
Digital Control Ports	3 digital control ports (C1 – C3) ❱ C1 functions as an SDI-12 I/O communication port. ❱ C2 functions as a Clk output for multiplexer control. ❱ C3 functions as a Reset output for multiplexer control.
RS-232 Port	1 9-pin RS-232 port (for connecting to a data logger COM port)
Measurement Resolution	0.001 Hz RMS (±250 mV differential input range; -55° to +85°C)
Measurement Accuracy	±0.013% of reading (±250 mV differential input range; -55° to +85°C)
Input Voltage Range	±250 mV (differential) for vibrating-wire inputs
Common Mode Range	±25 V
Baud Rates	Selectable from 1200 to 38.4 kbps (ASCII protocol is one start bit, one stop bit, eight data bits, and no parity.)
Memory	❱ 2 MB of OS Flash ❱ Either 128 or 512 kB of SRAM
Dimensions	21.6 x 11.18 x 3.18 cm (8.5 x 4.5 x 1.2 in.)
Weight	0.43 kg (0.95 lb)

Typical Current Drain @ 12 Vdc

Quiescent, Radio Off	~0.3 mA
Radio Duty Cycling 1 s	~3 mA (includes quiescent current)
Radio Always On	~26 mA (radio transmit current 100 mA)
Active RS-232 Communication	~6 mA (3 s after communication stops, the current will drop to the quiescent current)
Measurement	~25 mA (averaged over the 2 s)