CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

CRVW3-NE

Three-Channel Vibrating Wire Datalogger without Enclosure

Vibrating Wire Data Logger

Using patented VSPECT™ technology

Overview

The CRVW3-NE is a three-channel vibrating wire data logger. It is designed to be an independent data logger, or you can use it as a reliable component in your larger data acquisition system. The CRVW3-NE has multiple communication options and a power regulator for easy solar panel and battery connection.

The CRVW3-NE and the CRVW3 are similar products that share the same electronic components. The main difference between them is that the CRVW3-NE allows you to select the enclosure and battery, whereas the CRVW3 includes an environmental enclosure and battery as a complete system.

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

Benefits and Features

- Reads and stores data from one to three vibrating wire sensors
- Charge regulator included for solar panel connection
- Simple configuration interface
- Compatible with many existing Campbell Scientific data acquisition networks
- PakBus router/radio capabilities
- User-selectable battery and enclosure options

Detailed Description

The CRVW3-NE uses vibrating wire spectral-analysis technology (VSPECT™) to provide the best measurement possible for vibrating wire sensors. 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 strongest signal in the acceptable range while filtering out environmental and electrical noise.

The CRVW3-NE provides the following data: the resonant sensor frequency, thermistor resistance for temperature calculation, and diagnostic values to help determine the validity of the frequency measurement.

Note: The CRVW3-NE requires Device Configuration Utility (DevConfig) v 2.10 or later. When radio options are used, the CRVW3-NE requires LoggerNet v 4.3 or later.

Specifications

-NOTE-	❱ *All CRVW3-NE dataloggers are tested and guaranteed to meet the following electrical specifications in a -40° to +70°C non-condensing environment.* ❱ *The base -NA option and -RF422 option are CE approved, but the -RF451, -RF452, -RF407, -RF412, and -RF427 options are not CE approved.*
Operating Temperature Range	❱ *Non-condensing environment* ❱ -40° to +70°C
Processor	ST ARM CORTEX-M4 (32-bit with hardware FPU, running at 144 MHz)
Data Storage	16 MB serial flash, up to 420,000 records (single channel), up to 160,000 records (3 channels)
Real-Time Clock Accuracy	±3 min. per year
Measurement Interval Range	1 s to 1 day
USB Micro B	Direct connect to PC (supplies power for configuration and data collection), 2.0 full speed, 12 Mbps
Configuration	Software configurable, no programming required
Compliance	RoHS
Warranty	One year against defects in materials and workmanship
Static Vibrating Wire Measurements	Supported
Mounting	Mounting holes for easy mounting and installation in a Campbell Scientific enclosure
Dimensions	18.4 x 12.7 x 4.5 cm (7.25 x 5.0 x 1.75 in.)
Weight	0.36 kg (0.8 lb)

Power

Charge Terminal	16 to 28 Vdc (from solar panel or dc power converter). Typical applications use 10 to 20 W panels.
Battery Terminal	Sealed, rechargeable, lead-acid batteries. Typical applications use 7, 12, and 24 Ah rechargeable batteries.
Current Drain	❱ ~37.5 mA/s (each time a channel is measured) ❱ 1 mA (no radio, basic operation)

Measurements

Channel Count	3 vibrating wire (VW) and 3 thermistor/RTD (temperature) measurements
Measurement Speed	1 s per sensor (VW and temperature)

Measurements - Vibrating Wire

Measurement Excitation Options	2 V (±1 V), 5 V (±2.5 V),12 V (±6 V)
Measurement (Frequency) Resolution	0.001 Hz RMS (-40° to +70°C)
Time-series Basic Resolution	24-bit ADC
Measurement Accuracy	±0.005% of reading (-40° to +70°C)
Measurement Method	VSPECT (Spectral Analysis), U.S. Patent No. 7,779,690, includes diagnostic data

Measurements - Temperature (Resistance)

-NOTE-	*Thermistor or RTD resistance can be scaled to Temperature (Deg C) per manufacturer specifications. The resulting temperature can be used as a correction factor for the sensor's output.*
Measurement Method	Half-bridge ratiometric, 24-bit ADC, built-in completion resistor 4.99 kΩ 0.1%
Thermistor Precision	0.020 Ω RMS @ 3000 Ω (~0.00015 °C RMS for most vibrating wire thermistors)
Accuracy	±0.15% of reading (-40° to +70°C)

-RF407 Option

Internal Radio Description	5 to 250 mW, user selectable; 902 to 928 MHz license-free band, frequency hopping spread-spectrum radio
Radio Repeater	Devices with the -RF407 option can be set up as a radio repeater.
Where Used	US, Canada
Compliance Information	❱ 846A-XB900HP (Industry Canada ([IC]) ❱ RCPDIXB15-0672-A2 (Mexico IF)

- MCQ-XB900HP (United States FCC Part 15.247)

-RF412 Option

Internal Radio Description	5 to 250 mW, user selectable; 915 to 928 MHz license-free band, frequency hopping spread-spectrum radio
Radio Repeater	Devices with the -RF412 option can be set up as a radio repeater.
Where Used	Australia
Compliance Information	- ACMA RCM - 1846A-XB900HP (Industry Canada [IC]) - MCQ-XB900HP (United States FCC Part 15.247)

-RF422 Option

Internal Radio Description	2 to 25 mW, user selectable; 863 to 870 MHz license-free band, frequency hopping spread-spectrum radio
Where Used	Europe and some of Asia (ETSI)
EU Conformity	View the EU Declaration of Conformity in the Documents section of the web page.

-RF427 Option

Internal Radio Description	5 to 250 mW, user selectable; 905/920 MHz license-free band, frequency hopping spread-spectrum radio
Radio Repeater	Devices with the -RF427 option can be set up as a radio repeater.
Where Used	Brazil
Compliance Information	08335-17-10644 Brazil (ANATEL standards in Resolution No. 506)

-RF452 Option

Internal Radio Description	10 to 1,000 mW, user selectable; 902 to 928 MHz license-free band, frequency hopping spread-spectrum radio
Radio Repeater	Devices with the -RF452 option can be set up as a radio repeater.
Where Used	US, Canada, Australia
Compliance Information	- KNYAMM0921TT (United States FCC ID) - 2329B-AMM0921TT (Canada [IC])