CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

CRVW3

Three-Channel Vibrating Wire Datalogger

Self-Contained Vibrating Wire Datalogger

Using Patented VSPECT [a] Technology

The CRVW3 is ready for field deployment

The CRVW3-NE enables use of custom enclosure and battery applications.

Overview

The CRVW3 is a self-contained, low-cost, three-channel vibrating wire datalogger. It is designed to be an independent datalogger, or a component of a larger radio-linked data acquisition network when configured with available wireless communication options.

The CRVW3 can be purchased factory integrated with a power supply and a weatherproof enclosure, or purchased as a stand-alone datalogger for situations where a custom enclosure and/or battery combination is desired.

Benefits and Features

- Reads and stores data from one to three vibrating-wire sensors
- Charge regulator included for solar panel connection
- Enclosure rated to IP66
- Simple configuration interface
- Integrated rechargeable or alkaline battery options
- Compatible with many existing Campbell Scientific data acquisition networks
- PakBus router/radio repeater capabilities

Technical Details

VSPECT POWERED

To provide better vibrating wire measurements, Campbell Scientific developed the vibrating wire spectral-analysis technology (VSPECT). This innovative, patented technology delivers the most accurate measurement 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 largest signal in the acceptable range and disregarding noise.

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

Specifications

All CRVW3 dataloggers are tested and guaranteed to meet the following electrical specifications in a -40° to +70°C non-condensing environment.

Datalogger

- 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)
- Clock Accuracy: ±3 minutes per year
- Measurement Interval Range: 1 s to 1 day
- USB Micro B: Direct connect to Computer (supplies power for configuration and data collection), 2.0 full speed, 12 Mbps
- Configuration: software configurable, no programming required

Measurements

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

Vibrating Wire

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

Temperature (Resistance)[b]

- 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)

Power

- Charge Terminal: 16 to 28 Vdc from solar panel or dc power converter
- Battery Options: rechargeable 7 Ah or 8 D-cell alkaline
- Current Drain: 1 mA (no radio, basic operation); ~37.5 mA/s each time a channel is measured; refer to Wireless Communications table for current drain of onboard radios

Physical

- Operating Temperature Range: -40° to +70°C
- Compliance: RoHS (CE for non-radio model and CRVW3-RF422)

CRVW3 Option (with enclosure)

- Weight: 4.2 kg (9.2 lb) with rechargeable battery, 3.0 kg (6.6 lb) with alkaline batteries
- Enclosure Dimensions: 24.1 x 22.9 x 14.0 cm (9.5 x 9.0 x 5.5 in)
- Weather-Proof Enclosure Rating: NEMA 4X (IP66) with proper use of cable entry points
- Enclosure Mounting: Stainless-steel universal mount for pole/wall mount (optional) or plastic mounting tabs (included)
- IP66 enclosure

CRVW3-NE Option (no enclosure)

- Weight: 0.36 kg (0.8 lb)
- CRVW3-NE Dimensions: 18.4 x 12.7 x 4.5 cm (7.25 x 5.0 x 1.75 in)
- Mounting holes for easy mounting and installation in a Campbell Scientific enclosure

Warranty

- One year against defects in materials and workmanship

Wireless Communications

	-RF451	-RF407	-RF412	-RF422	-RF427[c]
Power (mW)	5 to 1000, user selectable	5 to 250, user selectable	5 to 250, user selectable	2 to 25, user selectable	5 to 250, user selectable
Frequency (MHz)	902 to 928	902 to 928	915 to 928	863 to 870	902 to 907.5, 915 to 928
Where Used	US, Canada, Australia	US, Canada	Australia	Europe and some of Asia (ETSI)	Brazil
Average Additional Current Drain @ 12 Vdc	Transmit: < 80 mA Idle on: 12 mA Idle 0.5 s power mode: 4 mA Idle 1 spower mode: 3 mA Idle 4 spower mode: 1.5 mA	Transmit: < 80 mA Idle on: 12 mA Idle 0.5 s power mode: 4 mA Idle 1 spower mode: 3 mA Idle 4 spower mode: 1.5 mA	Transmit: < 80 mA Idle on: 12 mA Idle 0.5 s power mode: 4 mA Idle 1 spower mode: 3 mA Idle 4 spower mode: 1.5 mA	Transmit: 20 mA Idle on: 9.5 mA Idle 0.5 s power mode: 3.5 mA Idle 1 s power mode: 2.5 mA Idle 4 s power mode: 1.5 mA	Transmit: < 80 mA Idle on: 12 mA Idle 0.5 s power mode: 4 mA Idle 1 spower mode: 3 mA Idle 4 spower mode: 1.5 mA
Compliance Information	United States: FCC ID: KNYAMM0921TT Industry Canada (IC): 2329B-AMM0921TT	United State:s FCC Part 15.247: MCQ-XB900HP Industry Canada (IC): 1846A-XB900HP Mexico IF: RCPDIXB15-0672-A2	ACMA RCM United States: FCC Part 15.247: MCQ-XB900HP Industry Canada (IC): 1846A-XB900HP	View the EU Declaration of Conformity at: www.campbellsci.com/crvw3	Brazil ANATEL standards in Resolution No. 506: 08335-17-10644

[b] *Thermistor or RTD resistance can be scaled to temperature (°C) per manufacturer procedure. The resulting temperature can be used as a correction factor* for the sensor's output.

[c] RF427 radio option to be released at a future date.