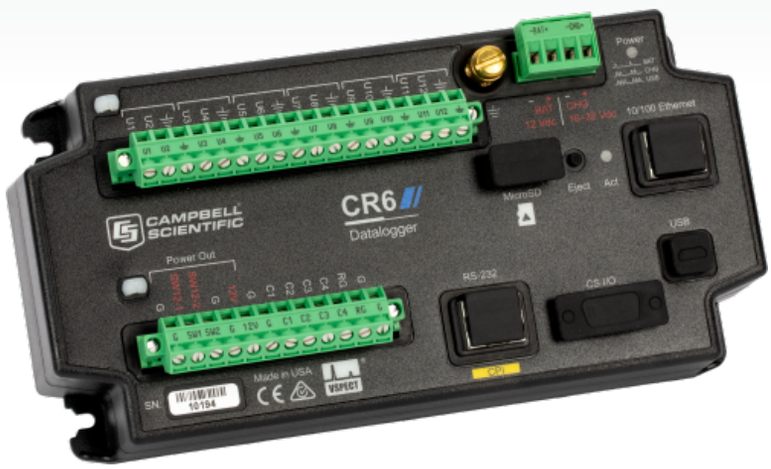
PRODUCT

CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

CR6

Measurement and Control Datalogger



One Data Logger, Countless Applications

Offering Wi-Fi and radio options

Overview

The CR6 Measurement and Control Datalogger is a powerful core component for your data-acquisition system. The CR6 datalogger provides fast communication, low power requirements, built-in USB, compact size, and high analog input accuracy and resolution. It uses universal (U) terminals to allow a connection to virtually any sensor—analog, digital, or smart. This multipurpose data logger is also capable of doing static vibrating wire measurements.

The CR6 can include integrated radio options:

- CR6-RF407: 900 MHz (United States and Canada)
- CR6-RF412: 920 MHz (Australia and New Zealand)
- CR6-RF422: 868 MHz (Europe)
- CR6-RF427: 905/920 MHz (Brazil)
- CR6-RF452: 900 MHz, 1 W (United States, Canada, and Australia)
- CR6-WIFI: 2.4 GHz

Learn about our patented VSPECT® spectral-analysis technology at our VSPECT® Essentials web resource.

The dynamic vibrating wire measurement technique is protected under U.S. Patent No. 8,671,758, and the vibrating wire spectral-analysis technology (VSPECT®) is protected under U.S. Patent No. 7,779,690.

Benefits and Features

- Operational in extreme environments with a standard operating range of -40° to +70°C and an extended operating range of -55° to +85°C
- Connects directly to a computer's USB port
- U terminals configurable to what you want them to be: analog or digital, input or output
- Supports static vibrating wire measurements using our patented VSPECT® spectral-analysis technology
- Differentiates even slight changes in data values with high-resolution measurements (to 0.05 µV, 24 bit Adc)
- Contains an onboard CPI port for hosting Campbell sensors and distributed modules (CDMs)
- Directly connects to Ethernet with 10/100 Ethernet RJ-45 or Ethernet over USB (virtual Ethernet)
- Includes a microSD card drive for extended memory requirements
- Provides simple serial sensor integration and measurement with SDI-12, RS-232, and/or RS-485
- Supports full PakBus® networking
- Includes an embedded web page for direct connection via web browser

For comprehensive details, visit: www.campbellsci.com/cr6

Detailed Description

The CR6 measures almost any sensor with an electrical response, drives direct communications and telecommunications, reduces data to statistical values, performs calculations, and controls external devices. After measurements are made, data are stored in onboard, nonvolatile memory awaiting transfer to the computer. Because most applications do not require that every measurement be recorded, the program usually combines several measurements into computational or statistical summaries, such as averages and standard deviations.

Communication Options

The CR6-WIFI Option

The CR6-WIFI is the ideal solution for short-range wireless IP communications.

Using a Wi-Fi enabled device and our free LoggerLink Mobile App, you can wirelessly connect to the CR6-WIFI. The CR6-WIFI comes factory-configured as a Wi-Fi access point. Alternatively, the CR6-WIFI can be configured to join an existing Wi-Fi network with standard or Enterprise (EAP) security.

The CR6-RF407 Option

The CR6-RF407 is ideal for medium-range, license-free radio communications.

This 900 MHz, 250 mW frequency-hopping spread-spectrum radio option can join a high-speed "mesh topology" radio network of other data loggers using the included RF407 radio.

The CR6-RF412 Option

The CR6-RF412 is ideal for medium-range, license-free radio communications.

Designed primarily for unlicensed operation in Australia and New Zealand, this 922 GHz, 250 mW frequency-hopping spread-spectrum radio can join a high-speed "mesh topology" radio network of other data loggers using the included RF412 radio.

The CR6-RF422 Option

The CR6-RF422 is ideal for short- to medium-range, license-free radio communications.

Used in the EU, this 868 MHz, 25 mW radio option includes listen-before-talk (LBT) and adaptive-frequency-agility (AFA). It can join a high-speed "mesh topology" radio network of other data loggers using the included RF422 radio.

The CR6-RF452 Option

The CR6-RF452 is typically used for long-range, license-free radio communications.

With this internal 900 MHz, 1 W, frequency-hopping spread-spectrum radio option, the CR6-RF452 can be part of a "star topology" network where all RF traffic routes back through the master. It can work in a network with other devices using RF450 or RF451 radios. CR6-RF452s may be configured as master, repeater, or remote devices and can be located miles apart in harsh RF environments.

Specifications

-NOTE-	❱ *Additional specifications are listed in the CR6 Specifications Sheet.* ❱ *This information applies to CR6 dataloggers with serial numbers 7502 and newer. These data loggers have two blue stripes on the label.*
Operating Temperature Range	❱ *Non-condensing environment* ❱ -40° to +70°C (standard) ❱ -55° to +85°C (extended)
Maximum Scan Rate	1000 Hz
Case Material	High-impact-resistant polycarbonate and UV-resistant TPE, recycle code 7
Analog Inputs	Up to 12 single-ended or 6 differential (The CR6 has 12 universal [U] and 4 control [C] terminals that can be programmed for a variety of functions. The number of analog inputs, switched excitations, and digital ports assume all the ports are configured the same.)
Universal Inputs	12 individually configured inputs for analog or digital functions
Pulse Counters	16 (C1 to C4 and U1 to U12)
Communications Ports	❱ Ethernet ❱ USB Micro B ❱ CS I/O ❱ CPI

	❱ RS-485 ❱ RS-422 ❱ SDI-12
Data Storage Ports	microSD
Switched 12 Volt	2 terminals
Digital I/O	16 terminals (C1 to C4, U1 to U12) configurable for digital input and output. Terminals are configurable in pairs for 5 V or 3.3 V logic for some functions.
Input Limits	±5 V
Analog Voltage Accuracy	❱ ±(0.04% of measurement + offset) at 0° to 40°C ❱ ±(0.08% of measurement + offset) at -55° to +85°C (extended temperature range) ❱ Accuracy specifications do not include sensor or measurement noise. ❱ ±(0.06% of measurement + offset) at -40° to +70°C
ADC	24-bit
Power Requirements	❱ 16 to 32 Vdc for charger input (CHG) (Current limited at 12 Vdc to 1.2 A at 20°C maximum.) ❱ 10 to 16 Vdc for battery input (BAT) (Current limited at 12 Vdc to 2.5 A maximum at 20°C.)
Real-Time Clock Accuracy	±3 min. per year (optional GPS correction to ±10 µs)
Internet Protocols	Ethernet, PPP, RNDIS, ICMP/Ping, Auto-IP (APIPA), IPv4, IPv6, UDP, TCP, TLS (v1.2), DNS, DHCP, SLAAC, Telnet, HTTP(S), SFTP, FTP(S), POP3/TLS, NTP, SMTP/TLS, SNMPv3, CS I/O IP, MQTT
Communication Protocols	CPI, PakBus, SDM, SDI-12, Modbus, TCP, DNP3, UDP, NTCIP, NMEA 0183, I2C, SPI, and others
Battery-backed SRAM for CPU Usage & Final Storage	4 MB
Data Storage	4 MB SRAM + 72 MB flash (Storage expansion of up to 16 GB with removable microSD flash memory card.)
Idle Current Drain, Average	❱ < 1 mA ❱ *Assumes 12 Vdc on **BAT** terminals; add 2 mA if using **CHG** terminals.*
Active Current Drain, Average	❱ 67 mA (20 Hz scan) ❱ *Assumes 12 Vdc on **BAT** terminals; add 2 mA if using **CHG** terminals.* ❱ 3 mA (1 Hz scan)
Static Vibrating Wire Measurements	Supported
Dimensions	21.0 x 10.2 x 5.6 cm (8.3 x 4.0 x 2.2 in.) Additional clearance required for cables and leads.
Weight	0.42 to 0.52 kg (0.92 to 1.15 lb) depending on communication option selected

CR6-RF407 Option

Radio Type	Frequency Hopping Spread Spectrum (FHSS)
Output Power	5 to 250 mW (user-selectable)
Frequency	902 to 928 MHz (US, Canada)
RF Data Rate	200 kbps
Receive Sensitivity	-101 dBm
Antenna Connector	RPSMA (External antenna required; see www.campbellsci.com/order/rf407 for Campbell Scientific antennas.)
Idle Current Drain, Average	12 mA (@ 12 Vdc)
Active Current Drain, Average	< 80 mA (@ 12 Vdc)

CR6-RF412 Option

Radio Type	Frequency Hopping Spread Spectrum (FHSS)
Output Power	5 to 250 mW (user-selectable)
Frequency	915 to 928 MHz (Australia, New Zealand)
RF Data Rate	200 kbps
Receive Sensitivity	-101 dBm
Antenna Connector	RPSMA (External antenna required; see www.campbellsci.com/order/rf412 for Campbell Scientific antennas.)
Idle Current Drain, Average	12 mA (@ 12 Vdc)
Active Current Drain, Average	< 80 mA (@ 12 Vdc)

CR6-RF422 Option

Radio Type	Frequency Hopping Spread Spectrum (FHSS)
Output Power	2 to 25 mW (user-selectable)

Frequency	863 to 870 MHz (European Union)
RF Data Rate	10 kbps
Receive Sensitivity	-106 dBm
Antenna Connector	RPSMA (External antenna required; see www.campbellsci.com/order/rf422 for Campbell Scientific antennas.)
Idle Current Drain, Average	9.5 mA
Active Current Drain, Average	20 mA

CR6-RF427 Option

Radio Type	Frequency Hopping Spread Spectrum (FHSS)
Output Power	5 to 250 mW (user-selectable)
Frequency	902 to 907.5 MHz/915 to 928 MHz (Brazil)
RF Data Rate	200 kbps
Receive Sensitivity	–101 dBm
Antenna Connector	RPSMA (External antenna required.)
Idle Current Drain, Average	12 mA (@ 12 Vdc)
Active Current Drain, Average	< 80 mA (@ 12 Vdc)

CR6-RF452 Option

Radio Type	Frequency Hopping Spread Spectrum (FHSS)
Output Power	10 to 1,000 mW (user-selectable)
Frequency	902 to 928 MHz
RF Data Rate	115.2 or 153.6 kbps (selectable speeds)
Receiver Sensitivity	» -108 dBm at 115.2 kbps (for 10^{-4} BER) » -103 dBm at 153.6 kbps (for 10^{-4} BER)
RF Connector	Reverse Polarity SMA (RPSMA) jack (external antenna required)
Idle Current Drain, Average	15 mA (@ 12 Vdc)
Active Current Drain, Average	650 mA (@ 12 Vdc)

CR6-WIFI Option

Operational Modes	Client or Access Point
Operating Frequency	2.4 GHz, 20 MHz bandwidth
Antenna Connector	RPSMA
Antenna	pn 16005 unity gain (0 dBd), 1/2 wave whip, omnidirectional with articulating knuckle joint for vertical or horizontal orientation
Transmit Power	7 to 18 dBm (5 to 63 mW)