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-RF451: 900 MHz, 1 W (United States, Canada, and Australia)
- CR6-WIFI: 2.4 GHz

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-RF451 Option

The CR6-RF451 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-RF451 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-RF451s may be configured as master, repeater, or remote devices and can be located miles apart in harsh RF environments.

Specifications

- Additional specifications are listed in the CR6 Specifications Sheet.
- Additional information applies to CR6 dataloggers with serial numbers 7502 and newer. These dataloggers 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.)

<table>
<thead>
<tr>
<th>Universal Inputs</th>
<th>12 individually configured inputs for analog or digital functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse Counters</td>
<td>16 (C1 to C4 and U1 to U12)</td>
</tr>
<tr>
<td>Communications Ports</td>
<td>CS I/O</td>
</tr>
<tr>
<td></td>
<td>USB Micro B</td>
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<tr>
<td></td>
<td>RS-422</td>
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<tr>
<td></td>
<td>RS-485</td>
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<tr>
<td></td>
<td>Ethernet</td>
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<tr>
<td></td>
<td>SDI-12</td>
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<tr>
<td></td>
<td>CPI</td>
</tr>
<tr>
<td>Data Storage Ports</td>
<td>microSD</td>
</tr>
</tbody>
</table>

For comprehensive details, visit: www.campbellsci.com/cr6
**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
Accuracy specifications do not include sensor or measurement noise.
±(0.08% of measurement + offset) at -55° to +85°C (extended temperature range)
±(0.06% of measurement + offset) at -40° to +70°C

**ADC**
24-bit

**Power Requirements**
10 to 18 Vdc for battery input (BAT) (Current limited at 12 Vdc to 2.5 A maximum at 20°C.)
16 to 32 Vdc for charger input (CHG) (Current limited at 12 Vdc to 1.2 A at 20°C maximum.)

**Real-Time Clock Accuracy**
±3 min. per year (optional GPS correction to ±10 µs)

**Internet Protocols**
Ethernet, PPP, CS I/O IP, RNDIS, ICMP/Ping, Auto-IP(APIPA), IPv4, IPv6, UDP, TCP, TLS (v1.2), DNS, DHCP, SLAAC, SNMPv3, NTP, Telnet, HTTP(S), FTP(S), SMTP/TLS, POP3/TLS

**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)
3 mA (1 Hz scan)
Assumes 12 Vdc on BAT terminals; add 2 mA if using CHG terminals.

**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

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### 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](http://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)

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### 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](http://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)

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### 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

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For comprehensive details, visit: [www.campbellsci.com/cr6](http://www.campbellsci.com/cr6)
### CR6-RF427 Option

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio Type</td>
<td>Frequency Hopping Spread Spectrum (FHSS)</td>
</tr>
<tr>
<td>Output Power</td>
<td>5 to 250 mW (user-selectable)</td>
</tr>
<tr>
<td>Frequency</td>
<td>902 to 907.5 MHz/915 to 928 MHz (Brazil)</td>
</tr>
<tr>
<td>RF Data Rate</td>
<td>200 kbps</td>
</tr>
<tr>
<td>Receive Sensitivity</td>
<td>-101 dBm</td>
</tr>
<tr>
<td>Antenna Connector</td>
<td>RPSMA (External antenna required)</td>
</tr>
<tr>
<td>Idle Current Drain, Average</td>
<td>12 mA (@ 12 Vdc)</td>
</tr>
<tr>
<td>Active Current Drain, Average</td>
<td>&lt; 80 mA (@ 12 Vdc)</td>
</tr>
</tbody>
</table>

### CR6-RF451 Option

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio Type</td>
<td>Frequency Hopping Spread Spectrum (FHSS)</td>
</tr>
<tr>
<td>Output Power</td>
<td>10 to 1,000 mW (user-selectable)</td>
</tr>
<tr>
<td>Frequency</td>
<td>902 to 928 MHz</td>
</tr>
<tr>
<td>RF Data Rate</td>
<td>115.2 or 153.6 kbps (user-selectable)</td>
</tr>
<tr>
<td>Receive Sensitivity</td>
<td>-103 dBm (at 153.6 kbps for 10^-4 BER)</td>
</tr>
<tr>
<td>-108 dBm (at 115.2 kbps for 10^-4 BER)</td>
<td></td>
</tr>
<tr>
<td>Antenna Connector</td>
<td>RPSMA (External antenna required; see <a href="http://www.campbellsci.com/order/rf451">www.campbellsci.com/order/rf451</a> for Campbell Scientific antennas.)</td>
</tr>
<tr>
<td>Idle Current Drain, Average</td>
<td>15 mA maximum (@ 12 Vdc)</td>
</tr>
<tr>
<td>Active Current Drain, Average</td>
<td>650 mA maximum (@ 12 Vdc)</td>
</tr>
</tbody>
</table>

### CR6-WIFI Option

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

For comprehensive details, visit: [www.campbellsci.com/cr6](http://www.campbellsci.com/cr6)