



Flagship Data Logger

Accurate, rugged, reliable

Overview

The CR1000X is our flagship data logger that provides measurement and control for a wide variety of applications. Its reliability and ruggedness make it an excellent choice for remote environmental applications, including weather stations, mesonet systems, wind profiling, air quality monitoring, hydrological systems, water quality monitoring, and hydrometeorological stations.

The CR1000X is a low-powered device that measures sensors, drives direct communication and telecommunications, analyzes data, controls external devices, and stores data and programs in onboard, nonvolatile storage. The electronics are RF-shielded by a unique sealed, stainless-steel canister. A battery-backed clock assures accurate timekeeping. The onboard, BASIC-like programming language, common to all contemporary Campbell Scientific data loggers, supports data processing and analysis routines.

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
- › Captures quickly changing data values with fast analog measurement capabilities (300+ Hz)
- › Differentiates even slight changes in data values with higher-resolution measurements (24 bit Adc)
- › Includes two non-isolated current input channels for directly connecting sensors with 0-to-20 mA or 4-to-20 mA current outputs
- › Contains an onboard CPI port for hosting Campbell high-speed sensors and distributed modules (CDM)
- › Directly connects to Ethernet
- › Includes 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 embedded web page for direct connection via web browser

Technical Description

The CR1000X is a low-powered device designed to measure sensors, drive direct communication and telecommunications, analyze data, control external devices, and store data and programs in on-board, non-volatile storage. The electronics are RF-shielded and glitch-protected

by a unique sealed, stainless-steel canister. A battery-backed clock assures accurate timekeeping. The on-board, BASIC-like programming language—common to all Campbell Scientific



data loggers—supports data processing and analysis routines.

The CR1000X wiring panel includes two switchable 12 V terminals, analog grounds dispersed among 16 analog terminals, and unpluggable terminal blocks for quick deployment.

Specifications

-NOTE- Additional specifications are listed in the [CR1000X Specifications Sheet](#).

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| Operating Temperature Range | <ul style="list-style-type: none"> › -40° to +70°C (standard) › Non-condensing environment › -55° to +85°C (extended) |
| Maximum Scan Rate | 1000 Hz |
| Case Material | Anodized aluminum |
| Analog Inputs | 16 single-ended or 8 differential (individually configured). Two analog inputs can measure 4 to 20 mA or 0 to 20 mA natively. Four analog inputs can provide pulse/digital I/O functions. |
| Pulse Counters | 10 (P1 to P2 and C1 to C8) |
| Voltage Excitation Terminals ⁴ (VX1 to VX4) | |
| Maximum Source/Sink Current | <ul style="list-style-type: none"> › ±40 mA (voltage excitation) › 50 mA (switched regulated) |
| Communications Ports | <ul style="list-style-type: none"> › RS-422 › Ethernet › USB Micro B › CS I/O › RS-232 › CPI › RS-485 |
| Data Storage Ports | microSD |
| Switched 12 Volt | 2 terminals |
| Digital I/O | 8 terminals (C1 to C8) configurable for digital input and output. Includes status high/low, pulse width modulation, external interrupt, edge timing, switch closure pulse counting, high-frequency pulse counting, UART, RS-232, RS-485, SDM, SDI-12, I2C, and SPI function. Terminals are configurable in pairs for 5 V or 3.3 V logic for some functions. |

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| Input Limits | ±5 V |
| Analog Voltage Accuracy | <ul style="list-style-type: none"> › ±(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 input |
| 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 (@ 12 Vdc) |
| Active Current Drain, Average | <ul style="list-style-type: none"> › 55 mA (20 Hz scan @ 12 Vdc) › 1 mA (1 Hz scan @ 12 Vdc) |
| Dimensions | 23.8 x 10.1 x 6.2 cm (9.4 x 4.0 x 2.4 in.) Additional clearance required for cables and leads. |
| Weight | 0.86 kg (1.9 lb) |

For comprehensive details, visit: www.campbellsci.eu/cr1000x 



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