



WHEN MEASUREMENTS MATTER



CR800 Series

Measurement and Control Datalogger

*Rugged, Reliable, and Ready
for any Application*



More info:
www.naskr.co.kr



CR800 and CR850 Measurement and Control Systems

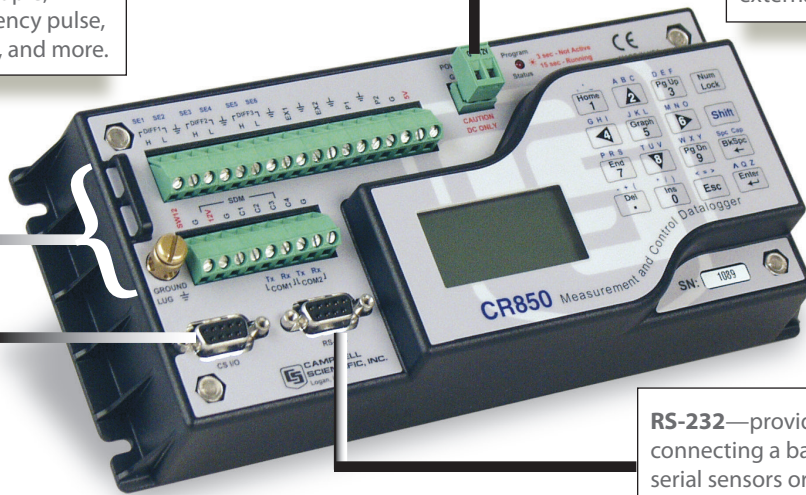
The CR800 and CR850 dataloggers provide precision measurement capabilities in a rugged, battery-operated package. Both models consist of measurement electronics encased in a plastic shell and an integrated wiring panel. The standard operating range is -25° to $+50^{\circ}\text{C}$. An extended range of -55° to $+85^{\circ}\text{C}$ for the CR800 or -30° to $+80^{\circ}\text{C}$ for the CR850 is also available.

Input/Output Connections—Individually configured for ratiometric resistive bridge, thermocouple, switch closure, high frequency pulse, low-level ac, serial sensors, and more.

Removable Power Terminal—simplifies connection to external power supply.

CS I/O Port—connects with AC-powered PCs and communication peripherals such as phone, RF, short-haul, and multidrop modems.

RS-232—provides a 9-pin DCE port for connecting a battery-powered laptop, serial sensors or RS-232 modems.



Benefits and Features

- 4 MB* of battery-backed SRAM
- Program execution rate of up to 100 Hz
- CS I/O and RS-232 serial ports
- 13-bit analog to digital conversions
- 16-bit microcontroller with 32-bit internal CPU architecture
- Temperature compensated real-time clock
- Background system calibration for accurate measurements over time and temperature changes
- Single DAC used for excitation and measurements to give ratiometric measurements
- Gas Discharge Tube (GDT) protected inputs
- Data values stored in tables with a time stamp and record number
- Battery-backed SRAM and clock that ensure data, programs, and accurate time are maintained while datalogger is disconnected from the main power source
- One program-status LED
- Serial communications with serial sensors and devices supported via I/O port pairs
- PakBus, Modbus, and DNP3 protocols supported

Model Descriptions

The models differ in their keyboard display. The CR800 uses an external keyboard display, the CR1000KD, which connects to the CR800 via its CS I/O port. The CR850 includes an on-board keyboard display as part of its integrated package.

Operating System/Logic Control

The on-board operating system includes measurement, processing, and output instructions for programming the datalogger. The programming language, CRBasic, uses a BASIC-like syntax. Measurement instructions specific to bridge configurations, voltage outputs, thermocouples, and pulse/frequency signals are included. Processing instructions support algebraic, statistical, and transcendental functions for on-site processing. Output instructions process data over time and control external devices.

Storage Capacity*

The CR800 series has 2 MB of flash memory for the Operating System, and 4 MB of battery-backed SRAM for CPU usage, program storage, and data storage. Data is stored in a table format.

*Campbell Scientific is increasing the data storage memory from 2 MB to 4 MB. Dataloggers with a serial number greater than or equal to 3605 will have a 4 MB memory. The 4 MB dataloggers will also have a sticker on the canister stating "4M Memory".

Input Output Terminals

Analog Inputs

Three differential (6 single-ended) channels measure voltage levels. Resolution on the most sensitive range is 0.67 μ V.

Pulse Counters

The CR800 and CR850 have two pulse channels that can count pulses from high level (5 V square wave), switch closure, or low level AC signals.

Switched Voltage Excitations

Two outputs provide precision excitation voltages for resistive bridge measurements.

Digital I/O Ports

The CR800-series dataloggers include four ports for frequency measurements, digital control, and triggering. Three of these ports can also be used to measure SDM devices. The I/O ports can be paired as transmit and receive. Each pair has 0 to 5 V UART hardware that allows serial communications with serial sensors and devices. An RS-232-to-logic level converter may be required in some cases.

CS I/O Port

AC-powered PCs and many communication peripherals connect with the datalogger via this port. Connection to an AC-powered PC requires either an SC32B or SC-USB interface. These interfaces isolate the PC's electrical system from the datalogger, thereby protecting against ground loops, normal static discharge, and noise.

RS-232 Port

This non-isolated port is for connecting a battery-powered laptop, serial sensor, or RS-232 modem. Because of ground loop potential on some measurements (e.g., low level single-ended), AC-powered PCs should use the CS I/O port instead of the RS-232 port (see above).

Switched 12 Volt

This terminal provides unregulated 12 Vdc that can be switched on and off under program control.

Enclosure/Stack Bracket

A CR800 or CR850 housed in a weather-resistant enclosure can collect data under extremely harsh conditions. The 28960 Enclosure Stack Mounting Kit allows a small peripheral to be placed under the mounting bracket, thus conserving space.

Transient Protection

Gas Discharge Tube (GDT) protects the inputs from electrical transients. The CR800 series is CE compliant under the European Union's EMC Directive, meeting ESD, EMC, Fast Transient standards.

Communication Protocols

The CR800 series supports the PakBus, Modbus, DNP3, TCP/IP, FTP, and SMTP communication protocols. With the PakBus protocol, networks have the distributed routing intelligence to continually evaluate links. Continually evaluating links optimizes delivery times and, in the case of delivery failure, allows automatic switch over to a configured backup route.

The Modbus RTU protocol supports both floating point and long formats. The datalogger can act as a slave and/or master.

The DNP3 protocol supports only long data formats. The dataloggers are level 2 slave compliant, with some of the operations found in a level 3 implementation.

The TCP/IP, FTP, and SMTP protocols provide TCP/IP functionality when the datalogger is used in conjunction with an NL201 or NL240.

Power Supplies

Typically, the CR800 and CR850 dataloggers are powered using a PS200 power supply, PS150 power supply, or BPALK battery pack. The PS200 and PS150 provide a 7 Ah sealed rechargeable battery that should be connected to a charging source (either a wall charger or solar panel). The BPALK consists of eight non-rechargeable D-cell alkaline batteries with a 7.5 Ah rating at 20°C.

Also available are the BP12 and BP24 battery packs, which provide nominal ratings of 12 and 24 Ah, respectively. These batteries should be connected to a regulated charging source (e.g., a CH200 or CH150 connected to a unregulated solar panel or wall charger).



The PS200 and CH200 (above) can monitor charge input voltage, battery voltage, on-board temperature, battery current, and load current.

Communication Options

To determine the best option for an application, consider the accessibility of the site, availability of services (e.g., cellular phone or satellite coverage), quantity of data to collect, and desired time between data-collection sessions. Some communication options can be combined—increasing the flexibility, convenience, and reliability of the communications.

External Data Storage Device

The CR800 and CR850 can use the SC115 2 GB Flash Memory Drive to augment onsite data storage or to transport data between the datalogger and PC.



The SC115 is a light-weight, portable instrument that fits in a pocket allowing easy transport between the datalogger and PC.

Keyboard Display

Keyboard displays are used to program the datalogger, manually initiate data transfer, and display data. Both the CR850's integrated keyboard display and the CR1000KD can show 8 lines by 21 characters (64 by 128 pixels). Their keyboard includes 16 characters. Custom menus are supported allowing customers to set up choices within the datalogger program that can be initiated by a simple “toggle” or “pick list”.

Mountable Displays

The CD100 and CD295 can be mounted in an enclosure lid. The CD100 has the same functionality and operation as the CD1000KD, allowing both data entry and display without opening the enclosure. The CD295 displays real-time data only.

iOS Devices and Android Devices

An iOS device or Android device can be used to view and collect data, set the clock, and download programs. To use an iOS or Android device, go to the Apple Store or Google Play and purchase our LoggerLink Mobile Apps.

Direct Links

AC-powered PCs connect with the datalogger's CS I/O port via an SC32B or SC-USB interface. These interfaces provide optical isolation. A battery-powered laptop can be attached to the datalogger's RS-232 port via an RS-232 cable; no interface required.

Internet and IP Networks

The NL240 or NL201 interfaces enable the CR800-series datalogger to communicate with a PC via TCP/IP.

Multidrop Interface

The MD485 intelligent RS-485 interface permits a PC to address and communicate with one or more dataloggers over the CABLE2TP two-twisted pair cable. Distances up to 4000 feet are supported.

Radios

Radio frequency (RF) communications are supported via narrow-band UHF, narrow-band VHF, spread spectrum, or meteor burst radios. Line-of-sight is required for all of our RF options.

Telephone Networks

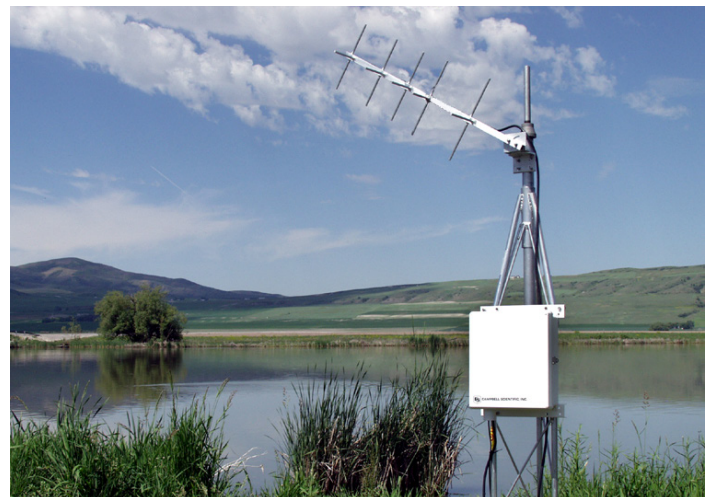
The CR800 series can communicate with a PC using landlines, cellular CDMA, or cellular GPRS transceivers. A voice synthesized modem enables anyone to call the datalogger via phone and receive a verbal report of real-time site conditions.

Short Haul Modems

The SRM-5A RAD Short Haul Modem supports communications between the datalogger and a PC via a four-wire unconditioned line (two twisted pairs).

Satellite Transmitters

Satellite transmitters offered by Campbell Scientific include a NESDIS-certified GOES transmitter, an Argos transmitter, and an Iridium transmitter. Satellite telemetry offers an alternative for remote locations where phone lines or RF systems are impractical.



Our GOES transmitters are used for stream stage (shown), water quality, and rainfall applications.