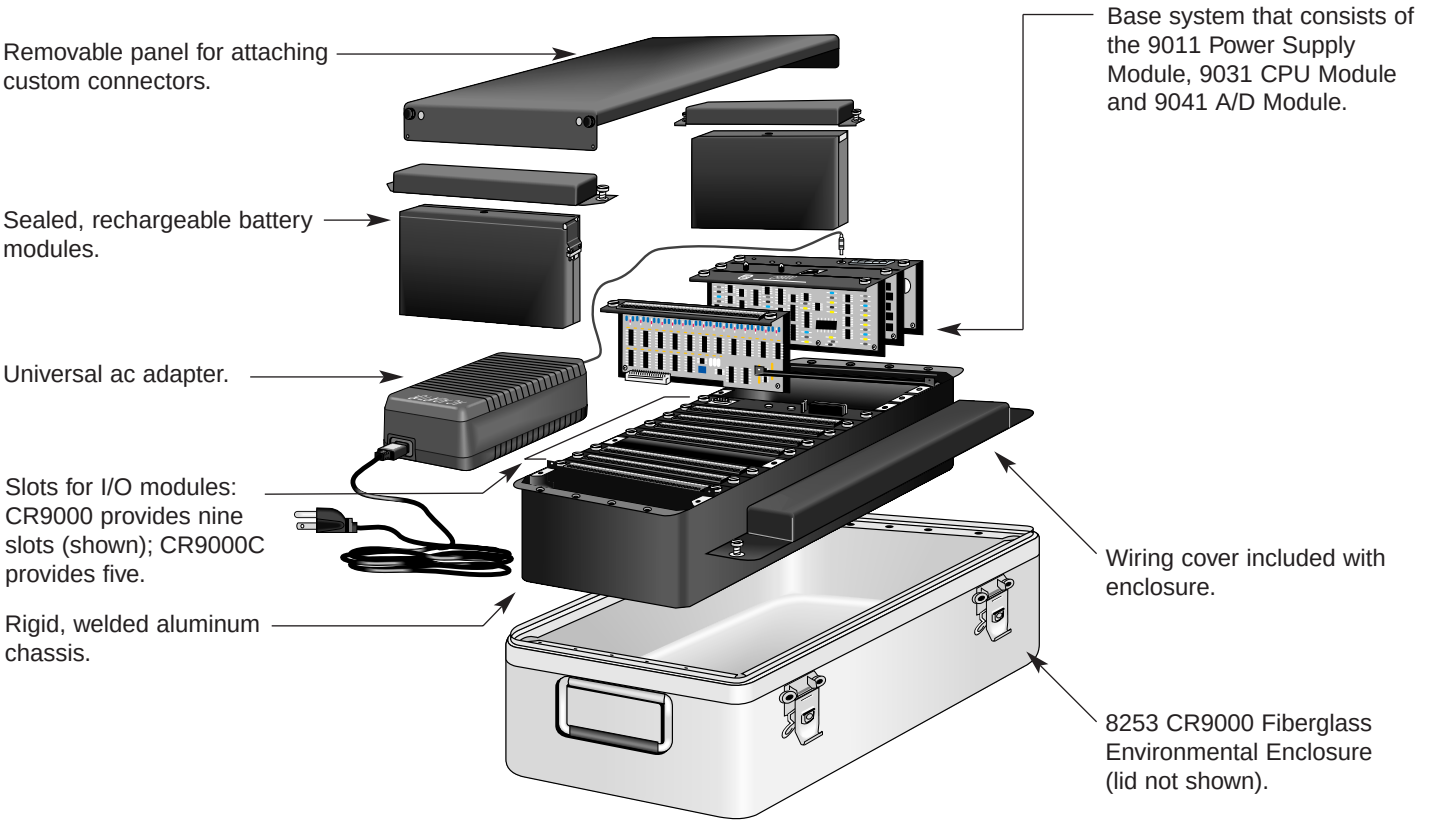
System Description



Design Features

- Modular data acquisition system that consists of a base system and a chassis with I/O module slots. Up to nine user-selected modules can be inserted in the CR9000 or five user-selected modules in the CR9000C
- Measurement rate of up to 100 K samples/second
- 16-bit resolution with programmable gain
- Powerful instruction set that supports measurement of most sensor types, on-board processing, data reduction, and intelligent control
- 2 Mbyte Flash EEPROM and 2 Mbyte Static RAM onboard for data and program storage
- Expandable memory using CR9080 Memory Module and ATA memory cards
- Robust ESD protection
- Low power, 12 Vdc operation
- Data values stored in tables with a time stamp and record number
- Operating temperature range of -25° to +50°C; extended range of -40° to +70°C available
- Supported by LoggerNet, PC9000, and ViewDAQ software packages

Base System

Power Supply

The power supply consists of a sealed rechargeable battery module, a universal ac adapter, and the 9011 Power Supply Module. The rechargeable battery module has a 14 Ahr rating for the CR9000 and a 7 Ahr rating for the CR9000C. The battery can be recharged using the universal ac adapter, a dc input, or other external sources. The 9011 Power Supply Module controls the current flowing to the sealed rechargeable battery module and prevents the battery current from flowing to the charging source. The power supply module includes a relay that allows the CR9000(C) to turn the power on during scheduled intervals which conserves power and increases the life of the sealed rechargeable battery.

9031 CPU Module

The 9031 is a 32-bit CPU module that provides system control, processing, and communications to a PC via a Transputer Link (TLink) or fiber optic interface. The module has 2 Mbyte static RAM and 2 Mbyte Flash EEPROM for data and program storage.

9041 A/D and Amplifier Module

The 9041 provides signal conditioning and 16-bit, 100 kHz A/D conversions.

Cover: Joint Damping Experiment (GAS payload, Space Shuttle Endeavor, STS-69); Passenger vehicle prototype tests; Strain monitoring on the Confederation Bridge, Prince Edward Island, Canada; Equipment performance monitoring (photo courtesy Case Corporation).

CR9000C

The CR9000C datalogger is a compact version of the CR9000. The CR9000C includes the 9011 Power Supply Module, 9031 CPU Module, 9041 A/D and Amplifier Module, five I/O module slots, one 7 Ahr sealed rechargeable battery, and an environmental enclosure.

I/O Modules

CR9050, CR9050E, and CR9051E Analog Input Modules
The CR9050(E) and CR9051E provide 14 differential (28 single-ended) input channels for measuring voltages up to ±5 V. Resolution is 1.6 µV on the most sensitive range. The CR9050(E) and CR9051E include an on-board reference PRT, thermo-stabilizing copper bar and connectors for precise thermocouple measurements. The CR9051E channels are fault protected to +50 V/-40 V. This ensures an overvoltage condition on one channel does not corrupt measurements on other channels. The CR9051E channels become open circuits when the datalogger is powered down so sensors are not loaded.

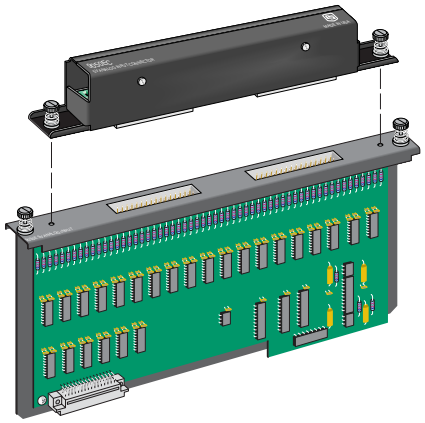
CR9052DC Anti-Alias Filter and FFT Spectrum Analyzer with dc Excitation
The CR9052DC is a high-performance anti-alias filter and Fast Fourier Transform (FFT) spectrum analyzer that extends the capabilities of the CR9000(C). Each CR9052DC module has six continuous excitation channels and six differential analog channels. The input range of the analog channels is programmable from ±20 mV to ±5 V. More detailed information and specifications are available in the CR9052DC product literature.

CR9055 or CR9055E 50-Volt Analog Input Module
The CR9055(E) has 14 differential (28 single-ended) programmable input channels for measuring voltages up to ±50 V. Resolution to 16 µV is available.

CR9058E Isolation Module
The CR9058E provides 10 isolated differential channels for measuring thermocouples or other low level voltage measurements that are at an elevated voltage plane. Each channel has its own isolated ground for shielded cable connection, and its own 24-bit A/D converter that supplies input isolation for up to ±60 Vdc. An on-board digital signal processor provides digital noise filtering that is automatically maximized for the specified integration time. For precise thermocouple measurements, the CR9058E includes an on-board reference PRT and a thermo-stabilizing copper bar.

CR9060 Excitation Module
The CR9060 provides six continuous analog outputs (CAOs), 10 switched excitation channels, and eight digital control outputs. The CAOs have individual digital-to-analog converters for proportional control, waveform generation, and excitation. Each CAO sources up to 50 mA between ±5 V. The excitation channels provide precision voltages for bridge measurements. The digital outputs control external devices.

CR9071E Timer/Pulse Input Module
The CR9071E provides 16 digital I/O and 12 pulse counting channels. Four pulse channels count switch closures; the other eight channels count low-level ac signals. All of the pulse channels can measure high-level frequencies up to 5 MHz. The digital I/O channels are used for digital control, communications, output triggering, and pulse counting. The CR9071E supports interval timing, pulse width duration, and time since first channel.



The Easy Connector module (above) allows sensor wiring to stay intact while the analog input module (lower) and the rest of the CR9000 system are used elsewhere.

CR9080 PCMCIA Memory Module
The CR9080 contains two PC-card slots and a 9-pin serial I/O port. The PC-card slots support two Type I or Type II PC-cards or one Type III hard drive. The PC-cards can be used to expand the datalogger's storage capacity and to transport data or programs from the datalogger to a PC. The 9-pin serial I/O port allows serial communications with CSI peripherals at rates up to 115,200 bps.

Easy Connector Modules
The CR9050E, CR9051E, CR9052DC, CR9055E, CR9058E, and CR9071E include an "Easy Connector" module. Sensor wiring attaches to the easy connector module. The easy connector module can be easily removed from the CR9000(C) system by loosening two thumbscrews. This allows the sensor wiring to remain intact while the I/O module and the rest of the CR9000(C) system are used elsewhere.

Transient Protection

Rugged gas tubes protect all terminal block inputs and outputs from electrical transients. The CR9000(C) is CE compliant under the European Union's EMC Directive, meeting ESD, EMC, Fast Transient standards.

Operating System / Logic Control

The on-board operating system includes measurement, processing, and output instructions for programming the datalogger. The programming language, CRBASIC, is easy to understand. Measurement instructions specific to bridge configurations, voltage outputs, thermocouples, and pulse/frequency signals are standard. Processing instructions support algebraic, statistical, and transcendental functions for on-site processing. Output instructions process data over time and control external devices. These instructions include averages, maximums, minimums, standard deviation, histograms, rainflow histograms, level crossings, and FFTs. Multiple datalogger programs can be stored in the CR9000(C) allowing easy program changes in the field.

Enclosures

8253 CR9000 Fiberglass Environmental Enclosure
The environmental enclosure is designed for field applications where the enclosure will be exposed to the elements. A CR9000 housed in this enclosure is protected from water, dust, and most environmental pollutants.

8255 CR9000 Lab Enclosure
The Lab Enclosure is for applications where the CR9000 will reside inside a building.

CR9000C Environmental Enclosure
The CR9000C includes a non-corrosive, sealed, aluminum enclosure that provides protection from water, dust, and most environmental pollutants.

Compatible Peripherals

- **SDM-CAN Interface** integrates the standardized data streams from a vehicle's on-board diagnostic system with other measurements.
- **SDM-SIO4 Serial Input/Output Module** provides four configurable serial RS-232 ports for connecting our GPS sensor or other devices that transfer data in a serial manner.
- **AM25T Multiplexer** increases the number of thermocouples the CR9000(C) can measure.
- **AM16/32 Multiplexer** increases the number of sensors the CR9000(C) can measure.

Communications

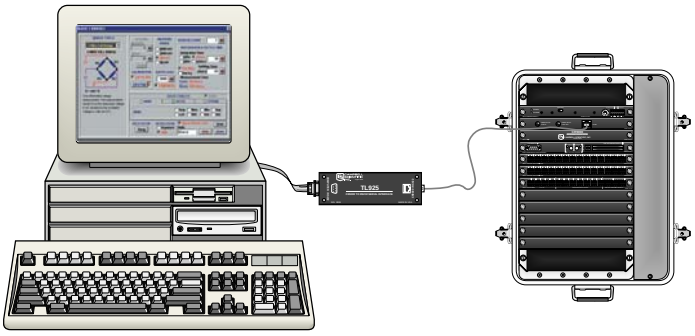
Parallel Port

Communications via the parallel port require the PLA100 Parallel Link Adapter. The PLA100 converts the computer's parallel port protocol to the CR9000's TLink high speed protocol. It includes a 25-pin connector that connects to the computer's parallel port and an 8-pin RJ45 connector that connects to the CR9000(C).

Serial Port

Communications via the serial port requires the TL925 RS-232 Serial Interface. The TL925 isolates the computer electrical system from the datalogger, thereby protecting against ground loops, normal static discharge, and noise. The TL925 also converts the computer RS-232 serial protocol to the CR9000 TLink high speed serial protocol. The TL925 supports baud rates from 300 bps to 115.2 kbps.

The TL925 is shipped with an SC12 cable and an RJ45-to-RJ45 Link Cable. The SC12 connects the TL925 to a computer 9-pin port. Alternatively the more robust SC12R can be used but must be purchased separately. Computers with a 25-pin port instead of a 9-pin port require a 25-pin to 9-pin cable such as Campbell Scientific's model 7026. The RJ45-to-RJ45 Link Cable connects the TL925 to the CR9000(C).



The TL925 RS-232 Serial Interface supports direct communications between the CR9000(C) and the computer's serial port as well as telecommunications via phone modems, spread spectrum radios, and satellite transmitters.

Telecommunications

Compatible options:

- Telephone
- Ethernet
- Spread spectrum radios
- Satellite transmitters

The Ethernet option requires a NL105 interface. The other telecommunication options require the TL925 interface.

Software tools for the CR9000(C) include PC9000, LoggerNet, and ViewDAQ. Additional information is contained in the PC9000, LoggerNet, and ViewDAQ product literature.

PC9000 Application Software

PC9000 is shipped with the CR9000(C). It supports programming, data collection, data display, data storage and report generation.

Program Generator/Editor

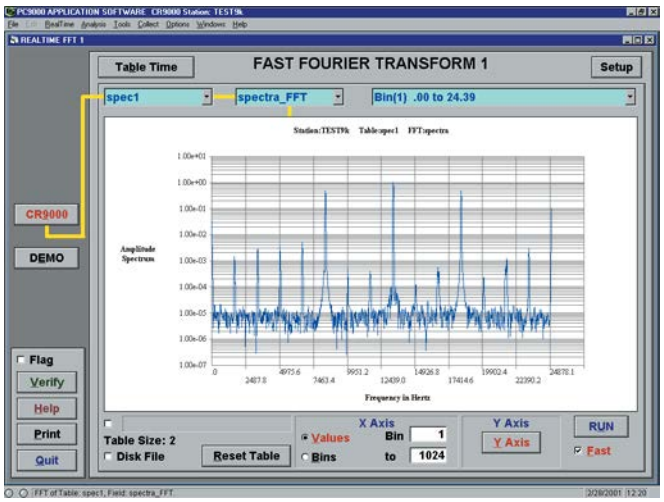
- Supports pick-and-click programming for most commercially available sensors
- Provides sample, maximum, minimum, average, standard deviation, histogram, rainflow histogram, and level crossing histogram output options
- Creates a CRBasic datalogger program file, wiring diagram, and data table information file

Communication/Data Collection

- Supports Ethernet, TLink/fiber optic, parallel port, serial ports, and PC cards
- Collects data on demand
- Transfers programs to or from the datalogger

Data Display

- Monitors real-time data using tabular displays, virtual meters, virtual oscilloscopes, X-Y plotters, FFTs, level crossing, rainflow histograms, and histograms
- Provides historical time series data
- Displays, rainflow, level crossing, and FFT data in a time-based "movie" format or an instantaneous snapshot format
- Supports 10 multi-charts with up to eight fields

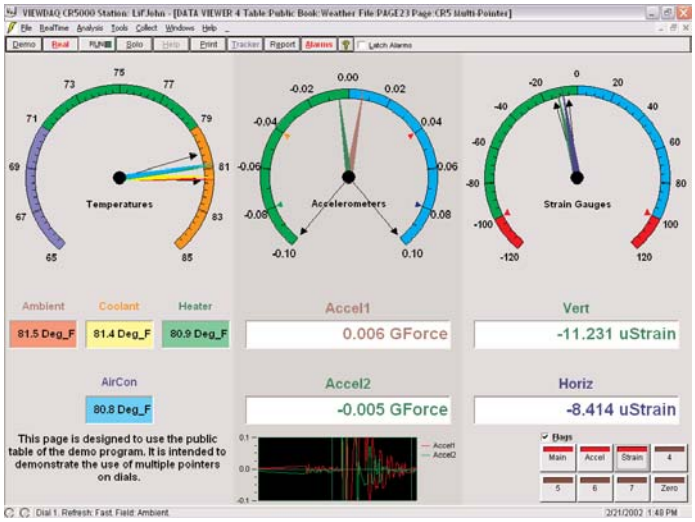


The FFT is a real-time data display in PC9000 that allows you to view FFT measurements instantly.

LoggerNet Datalogger Support Software

LoggerNet allows you to set up and manage a network of dataloggers. It supports programming, communications, and data retrieval between the dataloggers and a computer. LoggerNet is especially useful for networks that contain both CR9000s and other Campbell Scientific dataloggers, such as the CR10X and CR23X, that are not compatible with PC9000.

LoggerNet is comprised of one server application and several support applications. The server application handles all communication functions with individual dataloggers, manages requests for data from support applications, and provides datalogger network administration functions. LoggerNet's support applications provide an interface for retrieving, storing, and displaying data from the datalogger network. Data can be retrieved via Ethernet, telephone modems, spread spectrum radios, and direct links.



ViewDAQ provides a variety of virtual instruments for displaying real-time data. Virtual dials, numeric displays and strip chart shown.

ViewDAQ Real-Time Display Software

ViewDAQ is object-oriented software that allows you to create customized pages for displaying real-time data. ViewDAQ provides a variety of virtual instruments such as virtual dial, virtual thermometer, virtual gauge, compass, and dual compass that can be dragged and dropped anywhere on the page. It allows user control of position, size, colors, orientation, and scales. Besides virtual instruments, you can enter text and labels, set flags and alarms, and control background colors and page borders. Switches and potentiometers are provided for control functions. Multiple pages can be bound into a book.

Applications

Vehicle monitoring includes not only passenger cars but locomotives, airplanes, helicopters, tractors, buses, heavy trucks, drilling rigs, race cars, ATVs, and motorcycles.

Vehicle Monitoring and Testing

The versatile, rugged design and low power requirements of the CR9000(C) make it well suited for vehicle monitoring. The CR9000(C) can provide cold and hot temperature, high altitude, off-highway, and cross-country performance testing. It is compatible with our SDM-CAN interface and DSP4 Heads Up Display. Compatible sensors often used for vehicle monitoring and testing include thermocouples, pressure transducers, GPS receivers, pulse pick-ups, flow transducers, potentiometers, strain gages, load cells, digital switches, accelerometers, LVDTs, and tilt sensors. Most sensors connect directly to the CR9000(C), eliminating costly external signal conditioning.

Common measurements include:

- Suspension—strut pressure, spring force, travel, mounting point stress, deflection, ride
- Fuel system—line and tank pressure, flow, temperature, injection timing
- Comfort control—ambient and supply air temperature, solar radiation, fan speed, blower currents, ac on/off, refrigerant pressures, time-to-comfort
- Brakes—line pressure, pedal pressure and travel, ABS, fluid and pad temperature
- Engine—pressure, temperature, crank position, RPM, time-to-start, oil pump cavitation
- General vehicle—chassis monitoring, road noise, traction, payload, vehicle position/speed, steering, air bag, hot/cold soaks, wind tunnels, CANbus, wiper speed/current, vehicle electrical loads

Structural and Seismic Monitoring

The rapid sampling rate and large number of high resolution channels provided by the CR9000(C) make it ideal for structural and seismic monitoring. The CR9000(C) has been used in applications ranging from simple beam fatigue analysis, to structural mechanics research, to continuous monitoring of large, complex structures.

The onboard instruction set supports many algorithms that are useful for structural and seismic monitoring. The CR9000(C) can store data as rainflow or level crossing histograms. The rainflow and level crossing algorithms can be processed for extended periods of time, not just a finite number of cycles. The instruction set also supports triggered output with pre-trigger data capture capability. Triggers can be based on sensor output, time, and/or user control. For example, if an overpass or bridge is being monitored, data collection can be triggered by 1) a sensor detecting the approach of a car or an earthquake, 2) at pre-programmed times, or 3) by pushing a button. The control functions of the CR9000(C) allow it to activate alarms, actuate electrical devices, or shut down equipment based on time or measured conditions.

The CR9000(C) has provided remote, unattended monitoring of bridges, highway overpasses, amusement park rides, roads, buildings, and retaining walls.

Typical sensors used for structural and seismic monitoring include:

- Carlson strain meters
- Vibrating wire strain gages
- Foil strain gages (set up in quarter, half, or full bridge strain configurations)
- Inclinometers
- Crack and joint sensors
- Tilt sensors
- Piezoresistive accelerometers
- Piezoelectric accelerometers
- Capacitive accelerometers
- Borehole accelerometers
- Servo force balance accelerometers

Other Applications

- Aerospace/aviation—has endured the rigors of space travel and provided acceleration, structural, and equipment performance measurements.
- Geotechnical—measures tilt, convergence, displacement, geographic position, strain, load, vibration, overburden, level, flow, creep, and force for slope stability, subsidence, seismicity studies, structural restoration, or site assessment applications.
- Mining—monitors mine ventilation, slope stability, convergence, and equipment performance.
- Machinery testing—provides temperature, pressure, RPM, velocity, power, acceleration, position, torque, and strain measurements.
- Laboratory—can serve as a monitoring device to record parameters over time and can also be used to regulate and control test conditions.

Our dataloggers measured the effects of gravity on a test structure aboard a NASA low-gravity flight. Photo credit: NASA.

General CR9000 & CR9000C Specifications

Electrical specifications are valid over a -25° to +50°C range unless otherwise specified; testing over -40° to +70°C available as an option, excluding batteries. Non-condensing environment is required. To maintain specifications, Campbell Scientific recommends recalibrating dataloggers every two years.

9031 CPU MODULE

PROCESSORS: Main CPU is 32-bit with on-chip floating point unit. Measurements, timing, and setup done by hardware task sequencer with DMA type transfer to CPU memory.

MEMORY: 2 MB Flash EEPROM, 2 MB Static RAM

9011 POWER SUPPLY MODULE

VOLTAGE: 9.6 to 18 Vdc

TYPICAL CURRENT DRAIN: Base system with no modules is 500 mA active; 300 mA standby. Current drain of individual I/O modules varies. Refer to specifications for each I/O module for specific values. Power supply module can place the system in standby mode by shutting off power to the rest of the modules.

DC CHARGING: 9.6 to 18 Vdc input charges internal batteries at up to 2 A rate. Charging circuit includes temperature compensation.

INTERNAL BATTERIES: Sealed rechargeable with 14 Ahr (7 Ahr for the CR9000C) capacity per charge.

EXTERNAL BATTERIES: External 12 V batteries can be connected.

9041 A/D and AMPLIFIER MODULE

A/D Conversions: 16-bit, 100 kHz

PC9000(C) INTERFACES

PLA100

TYPICAL CURRENT DRAIN: 50 mA, supplied by the CR9000(C)

SIZE (excluding cable): 2.25" x 0.5" x 4.0" (5.7 x 1.3 x 10.2 cm)

CABLE LENGTH: Specified, in feet, by the user, 50 ft maximum length

WEIGHT: 2.5 lb (0.11 kg)

TL925

TYPICAL CURRENT DRAIN: 50 mA, supplied by the CR9000(C)

BAUD RATE: 300 bps to 115.2 kbps with auto baud detection.

SIZE: 2.1" x 1.0" x 6.8" (5.3 x 2.5 x 17.3 cm)

WEIGHT: 2.5 lb (0.11 kg)

TRANSIENT PROTECTION

All analog and digital inputs and outputs use gas discharge tubes and transient filters to protect against high-voltage transients. Digital I/Os also have overvoltage protection clamping.

PHYSICAL SPECIFICATIONS

Size

Lab Enclosure:	15.75"L x 9.75"W x 8"D (40 x 24.8 x 20.3 cm)
Fiberglass Enclosure:	18"L x 13.5"W x 9"D (45.7 x 34.3 x 22.9 cm)
CR9000C:	10"L x 11"W X 9"D (25.4 x 27.9 x 22.9 cm)

Weight

Lab Enclosure: 30 lbs including modules (13.6 kg)

Fiberglass Enclosure: 42 lbs including modules (19.1 kg)

CR9000C: 27 lbs including modules (12.3 kg)

Replacement Batteries: 6.4 lbs (2.9 kg)

Additional Modules: 1 lb each (0.5 kg)

WARRANTY

Three years against defects in materials and workmanship.

We recommend that you confirm system configuration and critical specifications with Campbell Scientific before purchase.

CR9000 & CR9000C I/O Module Specifications

CR9050(E) and CR9051E ANALOG INPUT MODULE with RTD

INPUT CHANNELS PER MODULE: 14 differential or 28 single-ended.

RANGE AND RESOLUTION:

Input Range (mV)	Resolution (1 A/D count) (µV)	Input Noise (µV RMS)	Max Sample Rates (kHz)
±5000	158.0	105	100
±1000	32.0	35	100
±200	6.3	7	50
±50	1.6	4	50

Input Range (mV)	Input Noise CR9050(E)	(µV RMS) CR9051E
±5000	105	130
±1000	35	35
±200	7	7
±50	4	4

Note: Measurement averaging provides lower noise and better resolution.

ACCURACY OF VOLTAGE MEASUREMENTS:

Single-Ended & Differential:
±(0.07% of reading + 4 A/D counts) -25° to +50°C
±(0.14% of reading + 4 A/D counts) -40° to +70°C

Dual Differential:
(two measurements with input polarity reversed)
±(0.07% of reading + 1 A/D count) -25° to +50°C
±(0.14% of reading + 1 A/D count) -40° to +70°C

COMMON MODE RANGE: ±5 V

DC COMMON MODE REJECTION: >120 dB

INPUT RESISTANCE: 2.5 gigaohms typical

MAXIMUM INPUT VOLTAGE WITHOUT DAMAGE: ±20 V CR9050(E), -40 to +50 V CR9051E

TYPICAL CURRENT DRAIN: 25 mA active

Resistance & Conductivity Measurements

(Also requires 9060 Excitation Module)

ACCURACY: ± (0.04% of reading + 2 A/D counts) limited by accuracy of external bridge resistors.

MEASUREMENT TYPES: 6-wire and 4-wire full bridge, 4-wire, 3-wire, and 2-wire half bridge. Uses excitation reversal to remove thermal EMF errors.

CR9052 ANTI-ALIAS FILTER MODULE

INPUT CHANNELS PER MODULE: six differential

CONTINUOUS EXCITATION CHANNELS PER MODULE: 12 (6 current, 6 voltage)

TYPICAL CURRENT DRAIN: 400 mA + 1.5*[I_{ex}], where I_{ex} is the sum of excitation currents provided by all channels.

Refer to the CR9052 product literature for a complete listing of specifications.

CR9055(E) 50 V-ANALOG INPUT MODULE

INPUT CHANNELS PER MODULE: 14 differential or 28 single-ended.

RANGE AND RESOLUTION:

Input Range (V)	Resolution (1 A/D count) (µV)	Input Noise (µV RMS)	Max Sample Rates (kHz)
±50	1580	1050	100
±10	320	350	100
±2	63	85	50
±0.5	16	60	50

Note: Measurement averaging provides lower noise and better resolution.

ACCURACY OF VOLTAGE MEASUREMENTS:

Single-Ended & Differential:
±(0.1% of reading + 4 A/D counts) -25° to +50°C
±(0.2% of reading + 4 A/D counts) -40° to +70°C

Dual Differential:
(two measurements with input polarity reversed)
±(0.1% of reading + 1 A/D count) -25° to +50°C
±(0.2% of reading + 1 A/D counts) -40° to +70°C

COMMON MODE RANGE: ±50 V

DC COMMON MODE REJECTION: >62 dB

INPUT RESISTANCE: 100 Kohms typical

MAXIMUM INPUT VOLTAGE WITHOUT DAMAGE: ±150 V

TYPICAL CURRENT DRAIN: 15 mA active

CR9058E ISOLATION MODULE

INPUT CHANNELS PER MODULE: 10 isolated, differential; each channel has its own isolation ground for shielded cable connection.

RANGE, RESOLUTION, AND INPUT RESISTANCE:

Input Range (Vdc)	Resolution w/o Averaging (µV)	Resolution w/ Averaging (µV)	Input Resistance (Kohms)
±2	±10	±2	10,000
±20	±100	±20	88.9
±60	±300	±60	269

ACCURACY: ±0.02% of Full Scale Range over -40° to +70°C

MINIMUM SCAN TIME PER MODULE:
VoltDiff: 1285 µs (778 samples per second) + integration time for no input reversal (RevDiff=0); or 2990 µs (334 samples per second) + integration time with input reversal (RevDiff=1)

TCDiff (range parameter set to V2C): 2570 µs (389 samples per second) + integration time for no input reversal (RevDiff=0); or 4275 µs (233 samples per second) + integration time with input reversal (RevDiff=1).

MAXIMUM CONTINUOUS VOLTAGE W/O DAMAGE:

Input Range (Vdc)	H to L (Vdc)	H or L to ISO Ground (Vdc)	ISO Ground to Systm Ground (Vdc)	H or L to Systm Ground (Vdc)
±2	±208	±109	±360	±469
±20	±223	±121	±360	±481
±60	±448	±233	±360	±593

MAXIMUM ESD VOLTAGE ON INPUTS: ±5000V

CR9060 EXCITATION MODULE

TYPICAL CURRENT DRAIN:
108 mA quiescent, 125 mA active

Analog Outputs

ANALOG OUTPUTS PER MODULE:
10 switched, 6 continuous

SWITCHED: Provides excitation for resistance measurements. Only one output can be active at a time.

CONTINUOUS: All outputs can be active simultaneously.

RANGE: ±5 V

ACCURACY: ± (0.2% of output ±4 mV)

RESOLUTION: 12-bit A/D (2.4 mV)

OUTPUT CURRENT: ±50 mA

Digital Control Outputs

CONTROL CHANNELS PER MODULE: 8

OUTPUT VOLTAGES (no load):
High: 5.0 V ±0.2 V
Low: < 0.2 V

OUTPUT RESISTANCE: 100 ohms

CR9071E COUNTER & DIGITAL I/O MODULE

Counter Channels

COUNTER CHANNELS PER MODULE: 12

MAXIMUM COUNTS PER INTERVAL: 2^{32} Maximum counts per interval should never be reached because with a maximum input frequency of 1 MHz, the 32-bit counter will go 71.58 minutes before it rolls over. The maximum CR9000 scan rate is 1 minute.

SWITCH CLOSURE MODE (4 channels)
Minimum switch closed time: 5 ms
Minimum switch open time: 6 ms
Maximum bounce time: 1 ms open without being counted

HIGH FREQUENCY MODE (all channels)
Minimum pulse width: 500 ns
Maximum input frequency: 1 MHz
Thresholds: Pulse counted on transition from below 1.5 V to above 3.5 V
Maximum input voltage: ±20 V

LOW LEVEL AC MODE (8 channels)
Input hysteresis: 10 mV
Minimum ac voltage: 25 mV RMS
Maximum input voltage: ±20 V
Frequency range:

(mV RMS)	RANGE (Hz)
25 mV	1 to 10,000
≥50 mV	0.5 to 20,000

Digital Inputs/Outputs

I/O CHANNELS PER MODULE: 16

OUTPUT VOLTAGES (no load)
High: 5.0 V ±0.2 V
Low: < 0.2 V

OUTPUT RESISTANCE: 320 ohms

Input State

High: 3.5 to 5 V
Low: -0.5 to 1.2 V

Input Resistance: 100 KOhms

Interval Measurement

I/O CHANNELS:

Resolution is the scan rate

PULSE CHANNELS

Maximum interval: 1 minute
Resolution: ±40 ns

CR9080 PCMCIA and MEMORY MODULE

PCMCIA CARD INTERFACE: Accepts two Type I/II, or one Type III SRAM or ATA Flash Memory Cards.

SERIAL I/O: Allows serial communications with CSI peripherals at up to 115,200 bps.

TYPICAL CURRENT DRAIN: 300 mA active

We recommend that you confirm system configuration and critical specifications with Campbell Scientific before purchase.

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