

# Card Storage Module and Reader for Mixed-Array Dataloggers and DSP4 Models CSM1 and MCR1

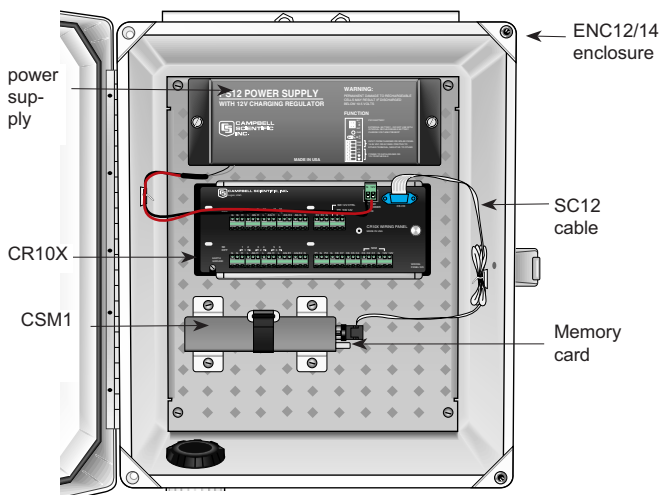
The CSM1 is a microprocessor-controlled read/write module that stores the datalogger's data to removable credit card-sized memory cards. The memory cards can then be easily transported to a computer for data download (via an MCR1).

This system allows the user to either leave the CSM1 with the datalogger and exchange the memory cards at regular intervals or move the CSM1 from datalogger to datalogger to retrieve data from each. Because the CSM1 has a low quiescent power consumption and a wide operating temperature range, it can be used in remote, battery-powered applications.

The MCR1 combines a CSM1 with an SC532 interface for storage module to computer communication. The MCR1 reads, writes, configures, and erases the memory card's data and datalogger programs. The MCR1 is typically used at the computer base station where it reads cards from one or more CSM1-equipped field sites.

The CSM1 and MCR1 are only compatible with mixed-array dataloggers (e.g., CR510, CR10(X), CR23X, and CR7) and the DSP4 Heads Up Display. They are NOT compatible with our CR200-series, CR800, CR850, CR1000, CR3000, CR5000, and CR9000(X) dataloggers.

## Typical Field Site



Sensor cabling and mounts not shown.

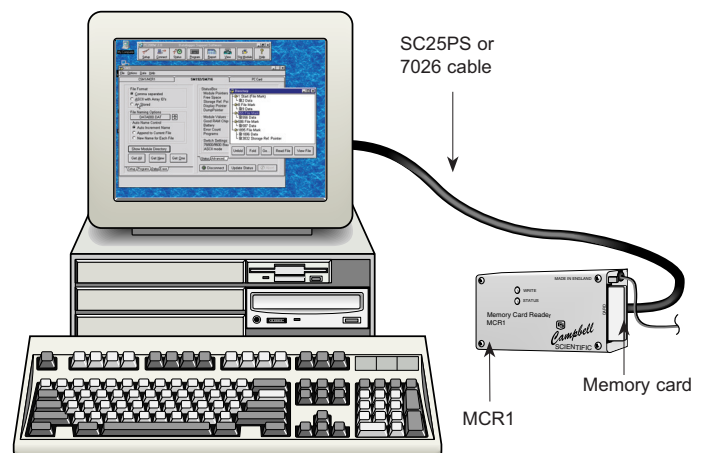
## Required equipment

- CSM1 (includes SC12 cable; mounting bracket is optional)
- Memory card(s). 1-, 2-, or 4-Megabyte JEIDA 4, PCMCIA standard memory cards are available. Proper CSM1/MCR1 operation is guaranteed only with cards tested and supplied by Campbell Scientific
- Datalogger (older dataloggers may require a PROM upgrade)
- Power supply (the datalogger's battery is typically sufficient)
- Environmental enclosure.

## Computer Base Station Required equipment

- IBM PC-compatible computer
- Datalogger Support Software
- Serial cable. SC25PS or equivalent for 25-pin serial ports, 7026 for 9-pin serial ports\*
- MCR1 (may be replaced by a CSM1 and an SC532 Interface)\*
- Memory card(s)

\*Alternatively, cards may be read directly by computer's PCMCIA slot. (Requires appropriate software drivers; see reverse for details.)



## Specifications

### CSM1

**Memory configuration:** Fill-and-stop; data segregated into files by filemarks

**Baud rate:** Supports all datalogger baud rates. Data transfer is typically 9600 or 19,200 baud; contact Campbell Scientific for information on using the module with Burst Mode

**Operating voltage:** 5 Vdc supplied by the datalogger

**Typical current drain (at 25°C):**

- Quiescent: <200  $\mu$ A
- Active (storing data from datalogger): 17 mA
- Active (in telecommunications waiting for input) = 4 mA; memory test (worst case) = 18 mA

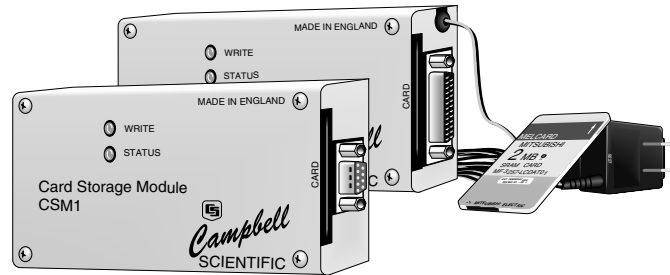
**Low battery indicator:** Lights up when approximately 3% battery life is remaining. The CSM1 blocks data storage when battery is exhausted

**Dimensions:** 6.1" x 3.5" x 1.3" (15.5 x 9.0 x 3.2 cm)

**Weight:** 12.3 oz. (350 g)

**Operating temperature range:** -40° to +50°C (for wider temperature ranges, please consider the SM4M/SMM16 Storage Modules)

**Construction:** Anodized aluminum case. Two LEDs indicate module power-up and data-write operations



The CSM1, MCR1 with AC adapter, and 2 megabyte memory card.

### MCR1 (where different from CSM1)

**Supply voltage:** 110 Vac to 7.5 Vdc adapter (factory installed) or 6 to 17 Vdc (with modification by user)

**Current drain (at 25°C):**

- Quiescent: RTS low = 16 mA, maximum
- Active: memory test (worst case) = 30 mA, typical

**Interface type:** 25-pin, D-type sub-miniature socket, RS-232C DCE interface

**RS-232 output levels:** 5 V, minimum with 3000  $\Omega$  load

**RS-232 input levels:**

- Low threshold: 0.8 V, maximum
- High threshold: 2.0 V, minimum
- Maximum input limit: 30 V
- Minimum input resistance: 3500  $\Omega$

**Operating temperature range:** -25° to +50°C

### Memory Cards

**Memory card storage capacity:**

Card size	Number of low-resolution data points
1 Megabyte	up to 524,160
2 Megabytes	up to 1,048,448
4 Megabytes	up to 1,999,872

**Data transfer rate (from card to PC):** up to 1500 data values per second

**Typical current drain (at 25°C):** Quiescent: card current drain increases as the card size increases (typically 100  $\mu$ A per 1 Megabyte card)

**Operating temperature range:** 0° to +60°C (-35° to +65°C on special order)

**Dimensions:** 3.3" x 2.1" x 0.1" (8.5 x 5.4 x 0.3 cm)

**Weight:** 1.1 oz. (30 g)

**Reading cards directly in PCMCIA slot:** Windows '95 supported; Windows 3.1 supported by the following software drivers:

- Award CardWare version 2.1 (Card Services 2.1) under Windows 3.1
- Phoenix Card Manager 3.2 (Card Services 3.0) under Windows 3.1
- SystemSoft Card Wizard (Card Services 3.0) under Windows 3.1

Not supported in Windows 98, ME, 2000, XP, or Vista

**Card battery type:** Lithium coin cell battery with a capacity of 120 to 170 mAh. Type and exact capacity varies with manufacturer

**Typical battery backup life (for 1 Megabyte card that is disconnected from an external power supply):** 7 years at -20°C, 8 years at +20°C, 2 years at +50°C

