CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

Storage Modules

Models SM4M and SM16M

Illustration shows SM4M storage module connected to a CR10X datalogger

Store up to 8 million low resolution data values in flash memory

Introduction

The SM4M and SM16M Storage Modules are housed in sealed containers fitted with a single 9-pin 'D' type connector. Two LEDs (light-emitting-diodes) are provided to indicate the operational status of the module.

The modules use non-volatile flash EEPROM memory which does not require power to retain data, and so do not require internal batteries. The flash memory will retain data for approximately ten years, and can be erased and re-written a minimum of 100,000 times.

The two models are identical except for memory capacity. The SM4M can store more than 2 million low-resolution storage values, while the SM16M can store more than 8 million values. Up to four modules can be readily connected to one datalogger to increase storage capacity to 64Mb.

Operation

The module is extremely simple to connect and use, and the built-in status LEDs let you know the status of the module at any time.

The module is connected to a compatible datalogger. The SM4M and SM16M 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.

Data Retrieval

The simplest way to retrieve data from the module is to use SMS which is part of the PC208W datalogger support software package. See box (right) and overleaf for more details.

Stored data can be retrieved on site (using a laptop computer, an SC532 Interface and a suitable power supply) or modules can be exchanged and data retrieved later in the office.

Key Features

- Flash memory requires no internal batteries
- Memory can be written to and erased a minimum of 100,000 times
- Can store more than 2-million (SM4M) or 8-million (SM16M) low resolution data values
- Low power consumption
- Extremely wide operating temperature range
- Data retained for up to 10 years
- Ring-style or fill-and-stop memory configuration can be selected
- Lightweight and compact yet extremely rugged sealed casing

Data Retrieval Software

Campbell Scientific's PC208W datalogger support software (Version 3.1 or later) supports the SM4M / SM16M modules. It allows direct data retrieval and access to the module functions when using CR500/510, CR10/10X and CR23X dataloggers on direct links, via the SMS utility.

PC208W can also be used for collection of data from remote modules/dataloggers connected via modems and standard phone lines.

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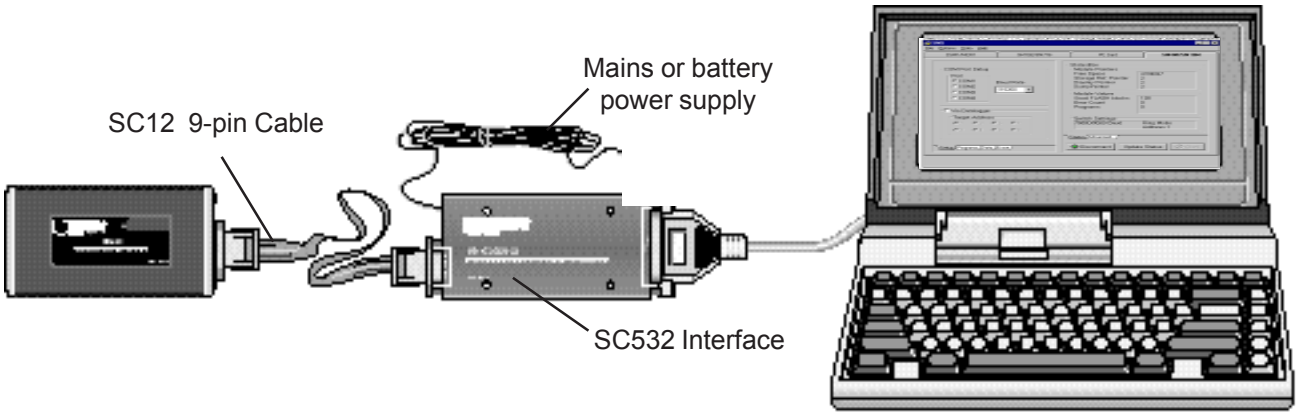
Data Storage with the SM4M and SM16M



SM4M connected to a portable PC using an SC12 cable and SC532 Interface

The module's internal memory is split into 64K blocks. There are 64 blocks in the SM4M and 256 blocks in the SM16M, equating to a capacity of more than 2-million and more than 8-million low resolution data values respectively.

The module memory can be configured as ring-style or fill-and-stop – ring memory is the default. Data is segregated in files delimited by filemarks written to the module automatically on power-up or by command of the datalogger program.

The modules support all datalogger baud rates, including CR10/10X Burst Mode, and also support *4 and *9 modes of data transfer.

Low resolution data needs two bytes per data value. Datalogger programs need the space as stored on disk, plus an overhead of approximately five bytes.

Program storage and retrieval is supported with Campbell Scientific's datalogger software. Most users of later datalogger models will choose PC208W for its in-built storage module software program, SMS. Where the datalogger software supports it, a program stored in program area 8 in the module is automatically loaded into the datalogger on power-up.

Remote collection of data from modules and dataloggers down normal telephone lines is also possible by using the Campbell Scientific COM220E telephone modem in conjunction with a computer and Hayes compatible modem.

Specifications

Storage Capacity:
SM4M – 4096Kb (equivalent to over 2-million low resolution data values)
SM16M – 16384Kb (equivalent to over 8-million low resolution data values)

Program Storage:
Up to eight programs with a total capacity of 128Kb (including labels). This is additional to the data storage capacity of the module.

Power Requirements:
5±0.3V DC @ 100mA (max.)

Average Current Drain:
Active (processing, e.g. memory test) 30-40mA
Active (waiting, e.g. comms. mode) 10mA
Typical (data storage from datalogger) 15mA
Low power (standby state) < 200µA
Peak (during flash erase) 60mA

Processor: Hitachi H8S

Operating System: 64Kb, flash memory based, user downloadable.

Memory:
Data retained for approximately 10 years from the date of storage.
Minimum of 100,000 erase/re-write sequences.

Data Transmission:
Data Storage: 9600, 76800 baud
Telecommunications: 1200, 2400, 4800, 9600, 38400, 57600, 115200 baud

Physical:
Operating temperature range:
-35°C to +65°C (-55°C to +85°C optional)
Case: Sealed construction – two status LEDs.
Interface: 9-pin Campbell Scientific.
Connection to datalogger: SC12 cable (supplied).
Dimensions: 135 x 75 x 20mm
Weight: 200g

Maintenance: No user serviceable parts inside the modules.

Contact Campbell Scientific for details of the CSM1 Card Storage Module

Campbell Scientific products are available from: