

# SDM-SIO4

## Four Channel Serial I/O Interface



The SDM-SIO4 has four configurable serial RS-232 ports that communicate with intelligent serial sensors, display boards, printers, satellite links, and other serial devices. Once programmed, the SDM-SIO4 communicates with devices connected in parallel with the datalogger's own program sequence, thus making the complete datalogging system faster and more efficient. A multi-tasking operating system allows concurrent transmission and receipt of data on all ports.

### Programming

For simple applications, the SDM-SIO4 can be configured and controlled by the datalogger alone, using a datalogger program instruction.

For more complicated applications, the SDM-SIO4 is configured using the 'command line' function within a PC's terminal emulator in much the same way as entering PC commands at the DOS prompt. This process allows you to set up detailed formatting and filtering mechanisms within the SDM-SIO4 that control the transmission of long, formatted output data and filter numerical values out of the received data. Thus, when the datalogger sends out long or complicated data strings it only needs to send a short command to the SDM-SIO4; it does not have to send the whole string. Likewise, by pre-programming the SDM-SIO4 for processing received data, it can strip off unwanted characters and reduce the data to either binary or floating point numbers. This minimizes processing and the time it takes for the datalogger to load data values into memory.

The set-up information is stored in battery-backed, write-protected memory, which allows you to set up the SDM-SIO4 in the office, then move it to a measurement site in an unpowered state.

### SDM Operation

Up to 16 SDM modules (in any combination) can be added to a single datalogger, making it possible for a full complement of SDM-SIO4s to provide up to 64 RS-232 ports. Multiple SDM-SIO4s are assigned different SDM addresses and are connected to the datalogger in parallel. After a module is enabled, it operates independently of the datalogger until additional commands are received or results are transmitted.



### Datalogger Connection

The CABLE5CBL is recommended for connecting the module to the datalogger. A 1-ft cable length should be sufficient when both datalogger and SDM-SIO4 are housed within an ENC12/14 enclosure; a 2-ft length may be required if the datalogger and SDM-SIO4 are housed at opposite ends of an ENC16/18 Enclosure.

The cable length should be as short as possible. Typically, the maximum cable length is 20 ft. Contact Campbell Scientific if the length needs to be longer.

### Power Requirements

Because of the minimal current drain (0.7 mA quiescent, 40 mA with all four ports active), the SDM-SIO4 is typically powered directly from the datalogger. A supplementary power supply may be required for some applications, especially where more than one SDM is operated by a single datalogger.

### Ordering Information

#### Serial I/O Interface Module

**SDM-SIO4** 4-Channel Serial I/O Interface

#### SDM-to-Datalogger Cable

**CABLE5CBL-L** 5-conductor, 24 AWG cable with drain wire and Santoprene jacket. Enter cable length, in feet, after the -L. Must choose a cable termination option (see below).

#### Cable Termination Options (choose one)

- PT** Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.
- PW** Cable terminates in connector for attachment to a prewired enclosure.

## Specifications

<b>Compatible Dataloggers:</b>	CR800, CR850, CR1000, CR3000, CR5000, CR9000(X), CR7, CR10(X), and CR23X. SDMs are not compatible with the CR500, CR510, and CR200(X)-series dataloggers
<i>SDM Port</i>	
<b>Communication Rate:</b>	Speed at which data is transferred is controlled by the datalogger and can vary with the microprocessor activity as well as the length of the SDM cables.
<b>Typical Transfer Rate:</b>	One byte per millisecond
<i>Power</i>	
<b>Power Supply:</b>	Unregulated 12 V supply, 9 to 18 Vdc
<b>Current Drain:</b>	
<b>All Ports Active:</b>	40 mA
<b>Quiescent:</b>	0.7 mA (quiescent state entered if there is no SDM or port activity for ~30 ms)
<b>Internal Battery:</b>	Retains configuration information only (lithium battery has an estimated life of 10 years)
<i>Environmental</i>	
<b>Temperature:</b>	-25° to +50°C
<b>Humidity:</b>	0 to 95% RH (non-condensing)
<i>Physical</i>	
<b>Case Material:</b>	Anodized aluminum
<b>Dimensions:</b>	7.3-in. x 3.5-in. x 1.4-in. (18.4-cm x 8.8-cm x 3.4-cm)
<b>Weight:</b>	15 oz. (0.4 kg)

<i>Serial Ports</i>	
<b>Number of Ports:</b>	4 (independently configurable for different serial data formats)
<b>Baud Rate:</b>	25 to 115,200 bps
<b>Port Output:</b>	0 to 5 V logic; ±5 V for RS-232 (switchable)
<b>Port Configuration:</b>	9-pin D connectors
<b>Data Flow Control:</b>	By datalogger or SDM-SIO4; if required, using hardware or software protocols
<b>Buffers (each port)</b>	
<b>Type:</b>	Fill & stop (once filled, additional data received is lost).
<b>Receive (Rx):</b>	981 bytes + 16-byte hardware buffer
<b>Transmit (Tx):</b>	981 bytes + 16-byte hardware buffer
<b>Processed Data Storage:</b>	891 bytes (suitable for storing 224 4-byte Campbell Scientific floating point values).
<b>Floating Point Buffer:</b>	Used only when the datalogger outputs floating point data via the SDM. This buffer is 241 bytes—sufficient for 60 floating-point values.
<b>On-Board Diagnostics:</b>	Built-in system watchdog resets the processor in the event of a crash caused by transients and a built-in LED gives an indication of SDM-SIO4 status on power-up.
<b>Input Voltage Limits:</b>	±25 V

