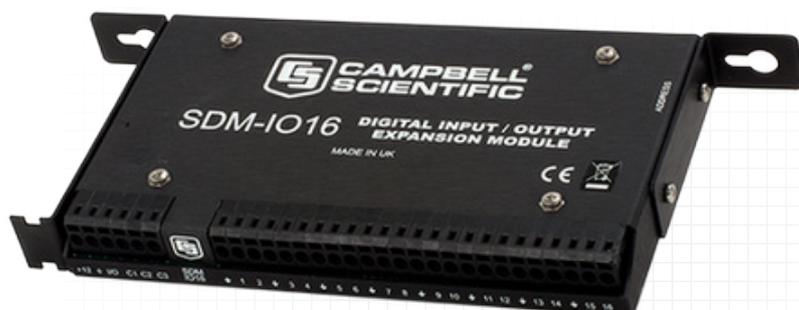# CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

SDM-IO16, SDM-CD16D, SDM-CD16AC
16-Channel Input/Output Expansion Modules

16-Channel expansion modules

For logic level input control and control of external devices

Overview

The SDM-IO16 expands the digital input and/or output capability of Campbell Scientific dataloggers. It offers similar functionality to the control ports of the dataloggers.

When a port is configured as an input it can measure the logical state of the port, count pulses, measure the frequency of and determine the duty cycle of signals applied to the port. In pulse counting mode there is also an option to enable switch debounce filtering so the unit can accurately

count switch closure events. The SDM-IO16 measures the frequency of signals by measuring the time between pulses, thereby giving relatively high resolution measurements even for low frequency signals.

The module can also be programmed to generate an interrupt signal to the datalogger when one or more input signals change state.

Benefits and Features

❭ Model SDM-IO16 expands both the input and output capability of selected dataloggers
❭ Enabled modules operate independently of the datalogger until additional commands are received or results transmitted

❭ Each SDM is configured with its own unique address, and controlled/interrogated through a single program instruction
❭ Compatible with selected Campbell Scientific dataloggers
❭ Total cable length between datalogger and SDMs can be up to 6 m

Other SDM Modules

Other SDM modules are available from Campbell Scientific. These are described in separate leaflets:

SDM-CAN Datalogger to CANbus Interface
SDM-AO4 Analogue Output Module
SDM-CD8S 8-Channel Solid State DC Controller

SDM-CVO4 Current/Voltage Output Module
SDM-SW8A Switch Closure Input Module
SDM-SIO1 1-Channel Serial I/O Module
SDM-SIO4 4-Channel Serial I/O Module

Datalogger Connection

The CABLE5CBL is recommended for connecting the module to the datalogger. A 30 cm cable length should be sufficient when both datalogger and SDM device are housed within an ENC12/14 enclosure; a 60 cm length may be required if the datalogger and SDM device are housed at opposite ends of an ENC16/18 Enclosure.

CRBasic dataloggers should use the SDMSpeed instruction if the cable length is longer than 7 m.

Up to 15 SDM-IO16 modules can be addressed allowing up to 240 ports to be controlled by the datalogger.

The SDM Jumper Wire Kit (pn #32505) connects up to four SDMs to the datalogger. This kit is recommended when multiple SDMs are connected to one datalogger or for extremely short distances between the SDM and datalogger. The CABLE5CBL-L cable is recommended for connecting a single SDM to the datalogger, and for longer distances between the SDM and datalogger.

SDM-IO16 Specifications

General

Compatibility:
CR800/850, CR1000, CR3000 and CR5000, CR10X and CR23X (CR10, 21X and CR7 in output mode only.)

Operating voltage: 12V DC (nominal 9V to 18V)

Current Drain at 12V DC:
600 μA typical standby (all ports HI, no load, not pulse counting).

Maximum (no output load): 3mA active with all 16 ports counting pulses at 2 KHz. Above the quiescent level, power consumption is roughly proportional to input signal frequency and number of ports used.

Current drawn from any output must be added to the quiescent level to give the total current drain.

SDM and I/O port:
0/5 V logic level ports compliant with the requirements of the CS SDM protocol – these are designed for connection to the datalogger's control/SDM ports

Operating temperature:
-25°C to +50°C standard (-40°C to +80°C extended)

Size: 230 mm x 100 mm x 24 mm

Weight: 350g

EMC Status: Complies with EN 61326

Total SDM cable length: 6 m maximum recommended

Port Specifications (Output Mode):
Output Voltage (no load)
  Output ON/HI, Nom. 5V (Min. 4.5V)
  Output OFF/LO, Nom. 0V (Max. 0.1V)

Output Sink Current: Will sink 8.6 mA from a 5V source)

Output Source Current:
  Will source 42 mA@3V,
  133 mA short-circuited to ground

Max. Output Current (total all outputs):
  Limited by the 12V supply

Port Specifications (Input Mode):
Input Voltage:
  Input high, 4.0V min. threshold
  Input low, 1.0V max. threshold
  All inputs feature Schmitt triggered detectors

Input Protection:
Input is clamped at -0.6V and +5.6V relative to ground via a 33R resistor to withstand a continuous current flow of 200 mA (including that which might be caused by accidentally connecting directly to a 12V supply).

An option is available to have high current spark gaps fitted to all channels, for exposed installations.

Input Impedance:
Input is biased to +5V relative to ground by a 100 kohm resistor.

SDM-CD16D Specifications

The SDM-CD16D is a synchronously addressed datalogger peripheral, which expands the digital output capability of Campbell Scientific dataloggers. As well as being able to drive normal logic level inputs, it is also able to directly control low voltage valves, relays etc.

General

Compatibility: as SDM-IO16

Operating voltage: 12V DC (nominal 9V to 18V)

Current Drain at 12V DC: 100 μA typical

Total cable length: 180 m (CR7), 6 m others

Output
Output voltage (no load):
Output ON/HI, 5V nom.
Output OFF/LO, 0V nom.

Output sink current: 8.6 mA from a 5V source

Output source current: 36 mA @ 3V

Max. output current: 400 mA total at 50°C with 12V supply.

Operating temperature: -25°C to +70°C

Size: 230 mm x 100 mm x 24 mm

Weight: 350g

EMC Status: Complies with EN 61326

SDM-CD16AC Specifications

The SDM-CD16AC provides 16 channels of on/off control for AC or DC electrical equipment. It has built-in relays for direct on/off control of external devices.

General

Compatibility: as SDM-IO16

Operating Voltage: 12V DC nominal (9 to 18V)

Toggle Switch: ON/OFF manual override, AUTO for datalogger control

Power Consumption

Current Drain at 12V DC: 6 mA quiescent, 45 mA per active relay (switch on or auto active)

Relay Specifications — General

Arrangement: Single pole double throw, break before make

Contact Material: Gold-plated silver

Expected Life: Mechanical 10^7 (contact closures)

Actuation/Release Time: Approx. 4 ms

Operating Temp.: -40°C to +70°C

Individual Contact Rating
5A at 30V DC, 0.3A at 110V DC
5A - 75W at 125V AC
5A - 125W at 277V AC

Compliance with safety regulations is the customer's responsibility, although Campbell Scientific can provide general guidance.
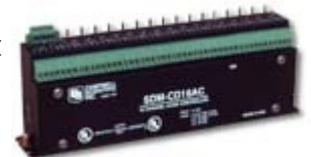
Coil
Coil Voltage: 9V to 18V DC
Coil Resistance: 360 Ohms ±10%
Size and weight: 246 mm x 51 mm x 86 mm, 0.8kg

EMC Status: Complies with EN 61326

WARNING: If the SDM-CD16AC is to be used to switch potentially dangerous voltages refer to your local wiring and safety regulations and check for statutory requirements before installation.