CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

CDM-A108 and CDM-A116

Analog Measurement Modules

24-Bit Resolution

Greatly Increases Sensor Capacity

Overview

The CDM-A108 and CDM-A116 are 24-bit analog input modules that significantly increase the number of analog channels in a datalogger system. The CDM-A108 has eight differential channels and the CDM-A116 has 16 differential channels.

The CDM-A108 and CDM-A116 feature a 24-bit, analog-to-digital converter and a low-noise, analog front-end to provide superior analog measurements. They also can make simultaneous measurements, support period average measurements, and include both current and voltage excitation channels.

Benefits and Features

- 8 differential or 16 single-ended inputs on the CDM-A108
- 16 differential or 32 single-ended inputs on the CDM-A116
- Ability to make simultaneous measurements
- 3.0 kHz maximum multiplexed sample rate using fast (100 µs) input settling
- 30 kHz maximum burst sample rate
- 24-bit sigma-delta ADC with 16 user-programmable notch frequencies from 30000 to 2.5 Hz, including 50 and 60 Hz. Previous generations of dataloggers could notch out 50 or 60 Hz
- ±5000 mV, ±1000 mV, and ±200 mV input range
- CANbus 2.0A/2.0B capable; contact Campbell Scientific for details

Specifications

Power Requirements

- Voltage: 9.6 to 32 Vdc

Typical Current Drain

- Sleep: <1 mA
- Active 1 Hz Scan: 2 mA (estimated)[a]
- Active 20 Hz Scan: 20 mA[a]

Estimated Accuracy

- ±(0.04% of reading + offset), 0° to 40°C
- ±(0.06% of reading + offset), -40° to 70°C
- ±(0.08% of reading + offset), -55° to 85°C

Voltage/Current Excitation Outputs

- Voltage Excitation: ±5 V @ 50 mA
- Current Excitation: ±2.5 mA; ±5 V compliance voltage
- Number of Voltage/Current Excitation Outputs: 2 (CDM-A108), 4 (CDM-A116)

Period Averaging

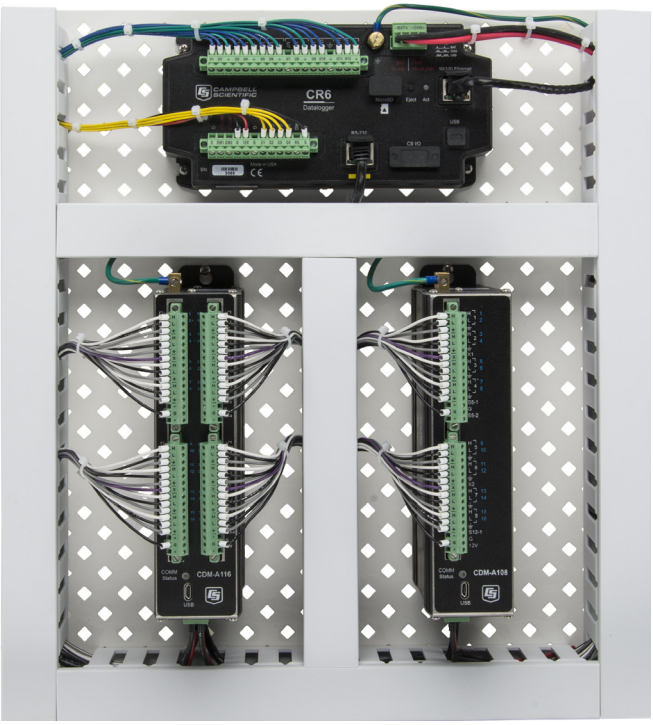
- Traditional period averaging on analog input channels

EU Declaration of Conformity

- www.campbellsci.com/cdm-a108
- www.campbellsci.com/cdm-a116

[a]*Assumes one single-ended measurement with the first notch frequency (f_{N1}) at 30 kHz.*

Specifications Continued



The CR6 (shown above) and CR1000X measure CDM devices natively, and therefore do not require an SC-CPI.

General Purpose Outputs

SW5V Outputs

- Number of Outputs: 2 (CDM-A108), 4 (CDM-A116)
- Output Resistance: 30 Ω

SW12V Outputs

- Number of Outputs: 1 (CDM-A108), 2 (CDM-A116)
- Typical Limit: 200 mA
- Minimum Limit: 180 mA

12V Outputs

- Number of Outputs: 1 (CDM-A108), 2 (CDM-A116)
- Typical Limit: 200 mA
- Minimum Limit: 180 mA

Communication

- CPI: For datalogger connection. Baud rate selectable from 50 kbps to 1 Mbps. Allowable cable length varies depending on baud rate, number of nodes, cable quality, and noise environment, but can be as long as 700 m under proper conditions.
- USB: USB 2.0 full speed connection available for attaching to a computer. Port is used to configure the module and download updates via our Device Configuration Utility.

Physical

- Dimensions: 20.3 x 12.7 x 5.1 cm (8 x 5 x 2 in.)
- Mounting: Standard 1-inch grid; din rail mounting available
- Operating Temperature: -40° to +70°C (standard), -55° to +85°C (extended)

Typical Measurement Performance

Analog Voltage Measurement Range and Resolution

f_{N1} [1] (Hz)	Range[2] (mv)	Typical Effective Resolution			
		Differential w/Input Reversal [3]		Differential w/o Input Reversal [3]	
		RMS µV	bits	RMS µV	bits
30000	±5000	10.350	20.0	14.756	19.5
	±1000	2.239	19.9	3.148	19.4
	±200	0.799	19.0	1.121	18.5
60	±5000	0.769	23.7	1.140	23.2
	±1000	0.162	23.6	0.261	23.0
	±200	0.056	22.9	0.113	21.8
50	±5000	0.732	23.8	1.112	23.2
	±1000	0.161	23.7	0.254	23.0
	±200	0.053	22.9	0.111	21.9
2.5	±5000	0.447	24.5	0.564	24.2
	±1000	0.095	24.4	0.144	23.8
	±200	0.020	24.3	0.077	22.4

[1] *First notch frequency*
[2] *Range overhead of ~6% on all ranges guarantees that full-scale values will not cause over range.*
[3] *Effective resolution (ER) in bits is computed from ratio of full-scale range to RMS noise.*

Analog Voltage Measurement Speed[1]

f_{N1} (Hz)	Multiplexed[2] Measurement			
	With Input Reversal		Without Input Reversal [3]	
	Time (ms)	Rate (Hz)`	Time (ms)	Rate (Hz)`
30000	1.46	698.49	0.75	1394.05
60	34.73	28.82	17.38	57.63
50	41.50	24.18	20.72	48.35
2.5	801.40	1.25	400.72	2.50

[1] *Default settling time of 500 µs.*
[2] *Refers to multiplexing circuitry internal to the CDM-A100 series.*

Warranty

- One year against defects in materials and workmanship.