

# AD pro CAN MM Series

## Type MC10 | MC2



### Product description

**AD pro** measurement modules feature 4 or 8 differential, galvanically isolated voltage inputs. They are also equipped with a very precise, bipolar sensor excitation, which is adjustable per channel.

**AD pro** measurement modules cover an extremely wide range of applications. They can be used for voltage measurement, high-precision current measurement (via shunts), measurement of very low voltages (such as strain gauge based sensors measuring at mV levels), and the acquisition of higher frequency signals with measurement data rates up to 10 kHz.

### Shipping content

- ▶ MiniModule AD4 pro MC10 | AD8 pro MC2
- ▶ Configuration software CSMconfig
- ▶ Documentation
- ▶ Calibration certificate in accordance with DIN EN ISO/IEC 17025

### Key features

**CAN**

- ▶ *Measurement inputs adjustable per channel from  $\pm 10$  mV to  $\pm 60$  V*
- ▶ *Measurement data rate per channel up to 10 kHz (AD4 pro MC10)*
- ▶ *Sensor linearization with axis points*
- ▶ *TEDS functionality according to IEEE 1451.4 (template 30 + template 40)*
- ▶ *Status LED per channel*



### Maintenance

- ▶ Calibration every 12 months recommended

### Accessories

- ▶ See datasheet "CAN Accessories"

## Technical data

Type designation	AD4 pro MC10	AD8 pro MC2
Technical data valid as of revision	G400	H400
		
Inputs	4 analog inputs	8 analog inputs
Measurement ranges	$\pm 10$ , $\pm 20$ , $\pm 50$ , $\pm 100$ , $\pm 200$ , $\pm 500$ mV and $\pm 1$ , $\pm 2$ , $\pm 5$ , $\pm 10$ , $\pm 20$ , $\pm 60$ V	
Internal resolution	16 bit	
Internal sampling rate per ch.	10 kHz	2 kHz
Measurement data rate/ sending rate per channel	1, 2, 5, 10, 20, 50, 100, 200, 500 Hz and 1 kHz, 2 kHz, 5 kHz <sup>1</sup> , 10 kHz <sup>1</sup>	1, 2, 5, 10, 20, 50, 100, 200, 500 Hz and 1 kHz, 2 kHz
	adjustable per module or per channel via configurable CAN identifier	
HW input filter	Low-pass filter 3 <sup>rd</sup> order, approx. 2.5 kHz	Low-pass filter 3 <sup>rd</sup> order, approx. 500 Hz
SW input filter	switchable 6 <sup>th</sup> order Butterworth filter, range: 0.1 Hz to 2 kHz	switchable 6 <sup>th</sup> order Butterworth filter, range: 0.1 Hz to 500 Hz
	automatically adjusted to measurement data rate, alternatively: threshold frequency adjustable per channel	
Channel-specific comments	free text consisting of up to 100 characters per channel	
Axis points	4 tables, each with up to 32 axis points	8 tables, each with up to 32 axis points
Input protection <sup>2</sup>	$\pm 60$ V permanent $\pm 100$ V permanent, additional ESD protection	
TEDS functionality supported	according to IEEE 1451.4 (template 30 + template 40)	
Gain error <sup>3</sup>		
at 25 °C	max. $\pm 0.05$ % of measured value	
Temperature drift	max. $\pm 10$ ppm/K	
Sensor excitation	bipolar, switchable and adjustable per channel <sup>4</sup>	
Voltage	$\pm 5$ , $\pm 8$ , $\pm 10$ , $\pm 12$ , $\pm 15$ V DC	
Current	per channel typ. $\pm 60$ mA, max. $\pm 120$ mA <sup>5</sup> , per module max. $\pm 240$ mA	per channel typ. $\pm 30$ mA, max. $\pm 120$ mA <sup>5</sup> , per module max. $\pm 240$ mA
Galvanic isolation <sup>6</sup>	no safety isolation in terms of high-voltage applications	
Channel/channel	500 V	
CAN/channel	500 V	
CAN/power supply	500 V	
CAN interface	CAN 2.0B (active), High Speed (ISO 11898-2:2016), 125 kBit/s to max. 1 MBit/s, up to 2 MBit/s with CSMcan Interface, data transfer free running	
Configuration	via CAN bus using CSMconfig or CSM INCA AddOn, settings and configurations stored in the module	
Power supply		
Minimum	6 V DC (-10 %)	
Maximum	50 V DC (+10 %)	
Power consumption <sup>7</sup>	typ. 0.8 W (without sensor excitation)	typ. 1.3 W (without sensor excitation)

Type designation	AD4 pro MC10	AD8 pro MC2
LED indicators		
CAN	power/status	
Measurement channels	configuration/operation/sensor excitation	
Housing	aluminium, gold anodized	
Protection class	IP67	
Weight	approx. 300g	approx. 500g
Dimensions (w × h × d)	approx. 120 × 32 × 50 mm approx. 120 × 37 × 50 mm (Slide Case)	approx. 200 × 35 × 50 mm approx. 200 × 40 × 50 mm (Slide Case)
Connectors <sup>8</sup>		
CAN/power supply	LEMO 0B, 5-pole, code G	
Signal inputs	LEMO 0B, 6-pole, code A	
Operating and storage conditions		
Operating temperature range	-40 °C to +125 °C	
Relative humidity	5 % to 95 %	
Pollution degree	3	
Storage temperature	-55 °C to +150 °C	
Conformity	CE	

<sup>1</sup> 5 kHz: 2 channels @ 500 kbit/s, 4 channels @ 1 Mbit/s, 10 kHz: 2 channels @ 1 Mbit/s, 4 channels @ 2 Mbit/s.

<sup>2</sup> Observe information regarding the intended use. See CSM document "Safety Instructions MiniModules".

<sup>3</sup> Further information can be found in the Technical Information document on the subject of "Deviation of Measurement".

<sup>4</sup> In case of full load (7.2 W) a power supply > 8 V is required (> 10 V as of an operating temperature of +85 °C), see "Tech Note".

<sup>5</sup> Distributive sensor excitation, see "Tech Note".

<sup>6</sup> These MiniModules are designed for measurements in vehicles with 12 V, 24 V, or 48 V on-board power supply systems. The maximum operating voltage at the measurement inputs is 60 V. Do not connect directly to systems with higher operating voltages, e.g. high-voltage batteries of hybrid or electric vehicles.

<sup>7</sup> The specified power consumption increases to up to 1.2 W (AD4) or 1.8 W (AD8) depending on TEDS wiring.

<sup>8</sup> Optionally available in other variants.

## additional products

### AD4 MC10

With its extended operating temperature range and extremely compact housing, AD4 MC10 measurement module is designed to be used for measurement tasks in the engine compartment. Due to its wide range of applications, it's increasingly used in test benches.



### AD4 OG100

AD4 OG100 provides the means to perform measurements with measurement data rates up to 100 kHz per channel at a high Ethernet bandwidth. EtherCAT® time synchronizations are fully supported. AD4 OG100 is either operated by using an EtherCAT® master via CANopen over EtherCAT® (CoE) or by using the Ethernet/EtherCAT® protocol converter XCP-Gateway in combination with an XCP-compatible data acquisition software.





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