# AD CAN MM Series

## Type MC10 | MC2


## Product description

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

With their extended operating temperature range and extremely compact housing, these **AD** measurement modules are designed to be used for measurement tasks in the engine bay. Due to their wide range of applications, they are increasingly used in test benches.

## Key features

- 4 or 8 differential voltage inputs, galvanically isolated
- Measurement inputs adjustable per channel from ±100 mV to ±60 V
- Measurement data rate per channel up to 10 kHz (AD4 MC10)
- High-precision bipolar sensor excitation, adjustable per channel
- TEDS functionality according to IEEE 1451.4 (template 30)

## Scope of delivery

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

## Maintenance

- Calibration every 12 months recommended

## Accessories

- See datasheet "CAN Accessories"

## Technical data

| Type designation | AD4 MC10 | AD8 MC2 |
|---|---|---|
| **Technical data valid as of revison** | H500 | J500 |
| |  |  |
| **Inputs** | 4 voltage inputs | 8 voltage inputs |
| Measurement ranges | ±100, ±200, ±500 mV and ±10, ±20, ±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 [1], 10 kHz [1] | 1, 2, 5, 10, 20, 50, 100, 200, 500 Hz and 1 kHz, 2 kHz |
| HW input filter | low-pass filter 3rd order, approx. 2.5 kHz | low-pass filter 3rd order, approx. 500 Hz |
| SW filter options per channel | ▸ Off<br>▸ 6th order Butterworth filter, range: 0.1 Hz to 2 kHz:<br>▸▸ automatically adjusted based on sending rate or<br>▸▸ user-selectable cutoff frequency<br>▸ Average value per sending interval | ▸ 6th order Butterworth filter, range: 0.1 Hz to 500 Hz:<br>▸▸ automatically adjusted based on sending rate or<br>▸▸ user-selectable cutoff frequency<br>▸ Average value per sending interval |
| Input protection [2]<br>Operational safety<br>Device safety | ±60 V permanent<br>±100 V permanent, additional ESD protection | |
| TEDS functionality supported | according to IEEE 1451.4 (template 30) | |

| | |
|---|---|
| **Gain error [3]** | |
| at 25 °C | max. ±0.05 % of measured value |
| Temperature drift | max. ±10 ppm/K |
| **Sensor excitation** | bipolar, switchable and adjustable per channel [4] |
| Voltage | ±5, ±8, ±10, ±12, ±15 V DC |
| Current | max. ±30 mA per channel |
| **Galvanic isolation [5]** | 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 suitable CAN 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 [4] | 6 V DC (-10 %) | |
| Maximum | 50 V DC (+10 %) | |
| Power consumption | typ. 0.9 W (without sensor excitation) | typ. 1.3 W (without sensor excitation) |

| Type designation | AD4 MC10 | AD8 MC2 |
|---|---|---|
| **LED indicator (CAN)** | power/status | |
| **Housing** | aluminum, gold anodized | |
| Protection class | IP67 | |
| Weight (device) | approx. 300 g | approx. 500 g |
| Dimensions (w × h × d) | approx. 120 × 32 × 50 mm<br>approx. 120 × 37 × 50 mm (Slide Case) | approx. 200 × 35 × 50 mm<br>approx. 200 × 40 × 50 mm (Slide Case) |
| **Connectors** [6] | | |
| 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 | |

[1] 5 kHz: 2 channels @ 500 kbit/s CAN bus, 4 channels @ 1 Mbit/s CAN bus, 10 kHz: 2 channels @ 1 Mbit/s CAN bus, 4 channels @ 2 Mbit/s CAN bus.

[2] Observe information regarding the intended use. See CSM document "Safety Instructions MiniModules".

[3] Further information can be found in the Technical Information document on the subject of "Deviation of Measurement".

[4] In case of full load (AD4 MC10: 3.6 W, AD8 MC2: 7.2 W) a power supply > 8 V is required (> 10 V as of an operating temperature of +85 °C), see Technical Information "Sensor Excitation of AD CAN MM Series" .

[5] 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.

[6] Optionally available in other variants.

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D-K-15214-01-00