



AD4 ECAT MM Series

Type OE100



Product description

The measurement module **AD4 OE100** has been designed for the acquisition of fast analog signals in the fields of automotive measurement technology. The module provides options to perform measurements with up to 100 kHz per channel at a high Ethernet bandwidth. The EtherCAT® mechanisms for time synchronization are fully supported. Due to its galvanically isolated sensor excitation of up to 24 V DC, this measurement module is ideally suited for IEPE sensors.

The **AD4 OE100** is operated by using the Ethernet/EtherCAT® protocol converter XCP-Gateway in combination with an XCP-compatible data acquisition software, like for example vMeasure CSM, CANape® or INCA, or by using an EtherCAT® master.

Shipping content

- ▶ Measurement module AD4 OE100
- ▶ Configuration software CSMconfig
- ▶ Documentation
- ▶ Device Description File (*.xml)
- ▶ Calibration certificate in accordance with DIN EN ISO/IEC 17025

Key features



- ▶ **4 differential voltage inputs, galvanically isolated**
- ▶ **Measurement data rate up to 100 kHz per channel**
- ▶ **Unipolar sensor excitation,**
 - ▶ adjustable per channel,
 - ▶ galvanically isolated,
 - ▶ especially suited for IEPE sensors
- ▶ **Precise module and channel synchronization (<1 µs)**
- ▶ **TEDS functionality according to IEEE 1451.4 (Template 30) supported**
- ▶ **Operating temperature range: -40 °C to +125 °C**


Maintenance

- ▶ Calibration every 12 months recommended

Accessories

- ▶ See datasheet "ECAT Accessories"

Technical data

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| Type designation | AD4 OE100 |
| |  |
| Technical data valid as of revision | B113 |
| Measurement inputs | 4 analog inputs |
| Measurement ranges | ± 5 , ± 10 , ± 20 , ± 45 , ± 90 V |
| Internal resolution | 16 bit |
| Internal sampling rate per ch. ¹⁾ | 1,000 kHz |
| Measurement data rate per ch. ²⁾ | 1, 2, 5, 10, 20, 50, 100 kHz |
| HW input filter | 9th order Butterworth filter, threshold frequency approx. 360 kHz |
| SW input filter ¹⁾ | switchable 6th order Butterworth filter, threshold frequency automatically adjusted to measurement data rate, alternatively adjustable per channel |
| Input protection ³⁾ | |
| Operational safety | ± 60 V permanent |
| Device safety | ± 100 V permanent, additional ESD protection |
| Input impedance | ≥ 900 k Ω / 20 pF |
| TEDS functionality supported | according to IEEE 1451.4 (Template 30) |
| Measurement uncertainty | |
| Gain error at 25 °C | max. ± 0.05 % of measured value |
| Offset and scaling error | max. ± 0.02 % of range |
| Gain drift | max. ± 10 ppm/K of measured value |
| Zero drift | max. ± 10 ppm/K of range |
| Sensor excitation | unipolar, galvanically isolated per channel from module power supply and from each other |
| Voltage | 5, 8, 10, 12, 15, 24 V DC |
| Tolerance | max. ± 10 % |
| Output power | max. 250 mW per channel |
| Galvanic isolation ⁴⁾ | no safety isolation in terms of high-voltage applications |
| Channel / channel | 500V |
| Channel / power supply | 500V |
| Sensor excitation / power supply | 500V |
| Sensor excitation / sensor excitation | 500V |
| EtherCAT® interface | Ethernet 100 Base-TX, 100 Mbit/s, EtherCAT® slave controller, synchronization via Distributed Clocks or Sync Manager 3 |
| Configuration | with configuration software CSMconfig via XCP-Gateway or with EtherCAT® master software via CANopen over EtherCAT® (CoE), settings and configurations stored in the device |

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|---|---|
| Type designation | AD4 OE100 |
| Power supply | |
| Minimum | 6V DC (-10 %) |
| Maximum | 50V DC (+10 %) |
| Power consumption | typ. 3.2 W (without sensor excitation) |
| LED indicators | |
| ECAT | Status / Link Activity IN / Link Activity OUT |
| Measurement channels | configuration / operation / sensor excitation |
| Housing | aluminium, silver anodized |
| Protection class | IP67 |
| Weight | approx. 500 g |
| Dimensions (w × h × d) | approx. 200 × 40 × 50 mm (Slide Case) |
| Connectors | |
| EtherCAT® IN | LEMO 1B, 8-pole, code L |
| EtherCAT® OUT | LEMO 1B, 8-pole, code A |
| Signal inputs | LEMO 1B, 8-pole, code G |
| 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 As of hardware revision B

² All measurement data rates are configurable via XCP-Gateway. When configuring via an EtherCAT® master software, a maximum measurement data rate of 10 kHz/channel is supported (EtherCAT® standard).

³ Observe information regarding the intended use. See CSM document "Safety Instructions MiniModules".

⁴ These measurement modules 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. Not suitable to be directly connected to systems with higher operating voltages, e.g. high-voltage batteries of hybrid or electric vehicles.

additional products

XCP-Gateway

The protocol converter **XCP-Gateway** is especially designed for the CSM EtherCAT® measurement module series and has been developed for measurement tasks with numerous measurement channels and high measurement data rates. **XCP-Gateway** is available in two versions: "Basic" and "+CAN". **XCP-Gateway +CAN** features two CAN interfaces to be used for connecting CSM's CAN-based measurement modules and to integrate them into the measurement data protocol XCP-on-Ethernet.





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