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.

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*

Shipping content

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

Maintenance

- Calibration every 12 months recommended

Accessories

- See datasheet “ECAT Accessories”

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Technical data

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 Device safety	±60 V permanent ±100 V permanent, additional ESD protection
Input impedance	≥ 900 kΩ / 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	500 V
Channel / power supply	500 V
Sensor excitation / power supply	500 V
Sensor excitation / sensor excitation	500 V
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

Type designation	**AD4 OE100**
Power supply	
Minimum	6 V DC (-10 %)
Maximum	50 V 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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CSM GmbH Germany is certified.

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