



AD4 ECAT MM series

Type OG10 | OG100 | OG1000



Product description

The **AD4 OG** ECAT MiniModule series has been designed for the acquisition of fast analog signals in the fields of automotive measurement technology. The modules provide options to perform measurements with up to 1 MHz per channel at a high Ethernet bandwidth. They are also suited for multi-channel applications with several hundred points of measurement. The EtherCAT® mechanisms for time synchronization are fully supported.

The **AD4 OG** measurement modules are 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 OG10 | OG100 | OG1000
- ▶ 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 1 MHz per channel*
- ▶ *High-precision bipolar sensor excitation, adjustable per channel*
- ▶ *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

Type designation	AD4 OG10	AD4 OG100	AD4 OG1000
			
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⁾	100, 200, 500 Hz and 1, 2, 5, 10 kHz	1, 2, 5, 10, 20, 50, 100 kHz	1, 2, 5, 10, 20, 50, 100, 200, 500, 1,000 kHz
HW input filter	4th order Butterworth filter, threshold frequency approx. 400 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 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	bipolar, galvanically isolated from module power supply		
Voltage	±5, ±8, ±10, ±12, ±15 V DC		
Current	typ. ±30 mA, max. ±120 mA per channel ⁴⁾ switchable and adjustable per channel ⁵⁾		
Galvanic isolation ⁶⁾	no safety isolation in terms of high-voltage applications		
Channel / channel	500 V		
Channel / power supply	500 V		
Sensor excitation / power supply	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 OG10	AD4 OG100	AD4 OG1000
Power supply			
Minimum	7.5 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 a standard EtherCAT® master, a maximum measurement data rate of 10 kHz/channel is supported.

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

⁴ Distributive sensor excitation, see "Application Note".

⁵ In case of full load a power supply > 11 V is required (> 15 V as of an operating temperature of +85 °C), see "Application Note".

⁶ 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.





CSM GmbH
Computer-Systeme-Messtechnik

Raiffeisenstraße 36 • 70794 Filderstadt • Germany
Phone: +49 711-7 79 64-20 • Fax: +49 711-7 79 64-40
info@csm.de • www.csm.de



To product page
at www.csm.de



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