AD4 pro ECAT MM Series

Type IG100 | IG1000

Product description

The **AD4 pro IG ECAT** MiniModule series has been designed for the acquisition of fast analog signals, especially very low voltages (mV level, e. g. for strain gauge based sensors), in the fields of automotive measurement technology. The modules provide options to perform measurements with up to 1 MHz per channel. They are also suited for multi-channel applications with hundreds of points of measurements. The EtherCAT® mechanism for time synchronization is supported.

The **AD4 pro IG 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, CANape® or INCA, or by using an EtherCAT® master.

Key features

- Measurement ranges from ±10 mV up to ±20 V
- 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

Scope of delivery

- Measurement module AD4 pro IG100 | IG1000
- 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 "XCP/ECAT Accessories"

Technical data

Type designation	AD4 pro IG100	AD4 pro IG1000
		
Technical data valid as of revision	E970	E870
Measurement inputs	4 voltage inputs	
Measurement ranges	±10, ±20, ±50, ±100, ±200, ±500 mV and ±1, ±2, ±5, ±10, ±20 V	
Internal resolution	16 bit	
Internal sampling rate per ch.	1,000 kHz	
Measurement data rate/ sending rate per channel [1]	1, 2, 5, 10, 20, 50, 100 kHz	1, 2, 5, 10, 20, 50, 100 kHz, 200, 500, 1,000 kHz
HW input filter	9th order Butterworth filter, measurement range ≥ ±200 mV, cutoff frequency approx. 360 kHz measurement range ±100, ±50 mV, cutoff frequency approx. 300 kHz measurement range ±20, ±10 mV, cutoff frequency approx. 100 kHz	
SW filter options per channel	▸ 6th order Butterworth filter, range: 10 Hz to 50 kHz: ▸ automatically adjusted based on sending rate or ▸ user-selectable cutoff frequency	▸ Off, only for sending rate of 1,000 kHz ▸ 6th order Butterworth filter, range: 10 Hz to 200 kHz: ▸ automatically adjusted based on sending rate or ▸ user-selectable cutoff frequency
Input protection [2] Operational safety Device safety	±60 V permanent ±100 V permanent, additional ESD protection	
Input impedance	approx. 490 kΩ/20 pF	
TEDS functionality supported	according to IEEE 1451.4 (Template 30)	
Measurement deviation [3]		
Gain error at 25 °C	max. ±0.05 % of measured value	
Offset and scaling error	max. ±0.02 % of range; ±10 µV for measuring ranges ≤ ±50 mV	
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	max. 30 mA per channel switchable and adjustable per channel [4]	
Galvanic isolation [5]	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 pro IG100	AD4 pro IG1000
Power supply		
Minimum[4]	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	aluminum, silver anodized	
Protection class	IP67	
Weight (device)	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] 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.

[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 a power supply >11 V is required (>15 V as of an operating temperature of +85 °C).

[5] 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.

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