AD4 ECAT MM Series
Type IG100 | IG1000

Product description

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

Key features

HS ▶▶   EtherCAT

▶ *Measurement ranges from ±1 V 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*

Shipping content

▶ Measurement module AD4 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 "ECAT Accessories"

CSM GmbH
Computer-Systeme-Messtechnik

Technical data

Type designation	AD4 IG100	AD4 IG1000
Technical data valid as of revision	B973	B873
Measurement inputs	4 analog inputs	
Measurement ranges	±1, ±2, ±5, ±10, ±20 V	
Internal resolution	16 bit	
Internal sampling rate per ch.	1,000 kHz	
Measurement data rate per ch. [1]	1, 2, 5, 10, 20, 50, 100 kHz	1, 2, 5, 10, 20, 50, 100, 200, 500, 1,000 kHz
HW input filter	9th order Butterworth filter, threshold frequency approx. 360 kHz	
SW input filter	switchable 6th order Butterworth filter, threshold frequency automatically adjusted to measurement data rate, alternatively adjustable per channel	
Input protection [2] Operational safety Device safety	±60 V permanent ±100 V permanent, additional ESD protection	
Input impedance	approx. 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 [3] 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 IG100	AD4 IG1000
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] 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] Distributive sensor excitation, see "Application Note".

[4] 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".

[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.

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 "pro". **XCP-Gateway pro** 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.

Innovative Measurement and Data Technology

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