HV AD4 ECAT MM Series
Type XW1000 | OW1000

Product description

CSM's **HV AD4** ECAT MiniModule series is equipped with four analog measurement inputs and has been specifically designed for measuring analog voltages (type **OW**) and high voltages (type **XW**) in high-voltage environments.

This makes the modules especially suitable for electric mobility applications – electric and hybrid vehicles – for stationary and mobile use.

The **HV AD4** ECAT measurement modules feature a maximum measurement data rate of 1 MHz per channel and can be used for the measurement of very fast analog signals.

Key features

- ▶ *4 analog inputs with reinforced insulation, galvanically isolated*
- ▶ *Measurement data rate up to 1 MHz per channel*
- ▶ *Measurement range adjustable per channel*
  - ▶ *Type XW: up to ±1,000 V (extended up to ±2,000 V)*
  - ▶ *Type OW: up to ±90 V*
- ▶ *Precise synchronization (modules & channels), important for calculation of electrical power, etc.*

Shipping content

- ▶ Measurement module HV AD4 XW1000 | OW1000
- ▶ Configuration software CSMconfig
- ▶ Documentation
- ▶ Device Description File (*.xml)
- ▶ Calibration certificate
- ▶ HV isolation test certificate

Maintenance

- ▶ HV isolation test at least every 12 months, see EN 61010 for scope of testing
- ▶ Calibration every 12 months recommended

Accessories

- ▶ See datasheet "ECAT Accessories"

CSM GmbH
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Technical data

Type designation	HV AD4 XW1000	HV AD4 OW1000
Technical data valid as of revision	A033	A013
Measurement inputs	4 analog inputs	
Measurement ranges	±100, ±200, ±500, ±1,000 V	±5, ±10, ±20, ±45, ±90 V
Extended	(±2,000 V) [1]	—
Internal resolution	16 bit	
Internal sampling rate per ch.	1,000 kHz	
Measurement data rate/ send rate per ch. [2]	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 impedance	approx. 9 MΩ / approx. 20 pF	approx. 900 kΩ / approx. 100 pF
Channel-specific comments	free text consisting of up to 100 characters per channel	
Measurement deviation [3]		
Gain error at 25 °C	max. ±0.05 % of measured value	
Offset and scaling error	max. ±0.02 % of range	
Gain drift	max. ±20 ppm/K of measured value	max. ±10 ppm/K of measured value
Zero drift	max. ±10 ppm/K of range	
Fields of application [4]	for measurements in HV environments [5]	
	for details see the following document that is also applicable: "Technical Information: Fields of Application for CSM HV Measurement Modules".	
Measurement voltages (unipolar & bipolar)	up to 1,000 V peak	up to 90 V peak for working voltages [5] up to 1,000 V DC
Isolation test [4]		
Type approval test	by external accredited test laboratory [5]	
Routine test	test voltage [5] 3,100 V DC, isolation test is to be performed at least every 12 months	
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 EtherCAT® master software via CANopen over EtherCAT® (CoE), settings and configurations stored in the device	
LED indicators		
ECAT	Status / Link Activity IN / Link Activity OUT	
Measurement channels	configuration / operation	

Type designation	HV AD4 XW1000	HV AD4 OW1000
Measurement categories [6]		
CAT 0	1,000 V	
CAT II	600 V	
CAT III	300 V	
Power supply		
Minimum	6 V DC (-10 %)	
Maximum	30 V DC (+10 %)	
Power consumption	typ. 3.5 W (@ +25 °C) typ. 6 W (@ +100 °C)	
Housing	aluminium with HV designation on the front-side (RAL 2003)	
Protection class	IP67	
Ground connection	M6 threaded hole	
Weight	approx. 500 g	
Dimensions (w × h × d)	approx. 200 × 40 × 76 mm (Slide Case)	
Connectors		
EtherCAT® IN	LEMO 1B, 8-pole, code L	
EtherCAT® OUT	LEMO 1B, 8-pole, code A	
Signal inputs	LEMO Redel 2P, 8-pole, code D (grey/red)	LEMO Redel 2P, 8-pole, code B (grey/black)
Operating and storage conditions		
Operating temperature range	-40 °C to +100 °C	
Relative humidity	5 % to 95 % (non-condensing)	
Operating altitude	max. 5,000 m above sea level (CAT 0)	
	max. 3,000 m above sea level (CAT II and CAT III)	
Pollution degree	4	
Storage temperature	-40 °C to +100 °C	
Conformity	CE	
Device safety	EN 61010-1:2010	

[1] The measurement ranges of the analog inputs are dimensioned for ±2,000 V for acquiring transient overvoltages.

[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] Further information can be found in the Technical Information document on the subject of "Deviation of Measurement".

[4] Please also read the CSM document "Safety Instructions HV AD4 ECAT MM".

[5] According to EN 61010-1:2010

[6] Further information can be found in the Technical Information document "Measurement Categories for CSM HV Measurement Modules".

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