µ-CANSAS-V1

1-channel CAN-Module for voltage measurement

The µ-CANSAS-V1 is a 1-channel differential measurement amplifier with 24-bit A/D-conversion, as well as an integrated sensor supply 5 V / 10 V, which transforms an analog sensor into an intelligent, distinctly identified digital smart sensor. The conditioned and digitized signal from an analog sensors can be output as a CAN- or CANopen® data stream. µ-CANSAS-V1 is particularly designed for use in extremely hot environments.

imc µ-CANSAS general characteristics

As a CAN-bus-based measurement engineering tool, the imc µ-CANSAS offers a selection of miniaturized measurement modules which process and digitize 1-channel sensor signals and output these as CAN-messages.

Fields of application

- For test rigs, vehicle testing, road trials and all-purpose measurement applications
- Deployable both in decentralized, distributed and in centralized measurement setups
- Operable with CAN-interfaces and CAN-data loggers from either imc or 3rd-party suppliers

Properties and capabilities

Operating conditions:

- Extended temperature range: -40°C to +120°C, including condensation
- Ingress Protection rating: IP65
- Mechanically robust

CAN interface:

- Configurable baud rate up to 1 MBit/s
- Default configuration ex-factory: Baud rate=500 kbit/s and IDs: Master=2, Slave=3
- Galvanically isolated

Synchronization:

- Configurable CAN data rate
- Synchronizing of multiple as well as to a global CAN-logger: based on CAN messages (no Sync-signal required)

Power supply:

- Galvanically isolated power supply input
- DC 9 V to 50 V

Heartbeat-message:

- Configurable with cyclical "life-sign", e.g. for integrity check purposes in test rigs
- Contains checksum for configuration and serial number, e.g. for consistency monitoring (checking of whether the correct module is still being used, for instance in installations undergoing maintenance)

FindMe:

- Identification of a module by means of selective LED flashing (via configuration software; does not occupy any additional CAN message)

Software

Configuration:

- Using imc CANSAS software (free of charge), including dbc-export
- Autostart with saved configuration; also pre-configurable at factory
- The module's current configuration can be read out and exported by the software; For transfer of configuration via physical transport of the module; for back tracing and recovery.
- Supports the CANopen® protocol according "CiA® DS 301 V4.0.2" and "CiA® DS 404V1.2"; see "CANSAS CANopen®" for a detailed description of the supported features and settings.

Measurement operation:

- Data logger operation:
  Software: imc STUDIO
  Hardware: imc measurement system with CAN-Interface, e.g.
  imc BUSDAQ, imc C-SERIE, imc SPARTAN
  imc CRONOS device family (CRFX, CRC, CRXT)
- With any desired CAN-interfaces and CAN-loggers from 3rd-party suppliers

Overview of available variants

Order Code	article no.	housing	signal connection	CAN connection
CAN/µ-V1-L	11600002	µ-CANSAS housing	1x 7-pin LEMO.HGG.1B.307	2x 5-pin LEMO.HGG.0B.305
CAN/µ-V1-AS	11600009	µ-CANSAS housing	1x 8-pin Phoenix (MPT0,5/8) with waterproof cable grommet	1x 6-pin Autosport (AS208-35PA)

Schock resistance:

- according to IEC 61373
  Broad band random, long time test (4.33 g_{RMS} / 15 h, 5 Hz to 250 Hz)
  Shock, half-sine (30.6 g_{RMS} / 18 ms, 18 shocks)
  Broad band random, functional test (0.55 g_{RMS} / 30 min, 5 Hz to 250 Hz)
- according to IEC 60068-2-27
  Shock, half-sine (60 g_{RMS} / 6 ms, 18 shocks)
  Shock, half-sine (75 g_{RMS} / 3 ms, 18 shocks)
  Shock, half-sine (85 g_{RMS} / 3 ms, 18 shocks)
  Shock, half-sine (100 g_{RMS} / 2.5 ms, 18 Schocks)
- according to MIL STD810F
  Rail Cargo Vibration Exposure (0.486 g_{RMS} / 9 h, 1 Hz to 350 Hz)
  U.S. Highway Truck Vibration Exposure (2.12 g_{RMS} / 3 h, 10 Hz to 500 Hz)
  General Minimum Integrity (7.7 g_{RMS} / 3 h, 20 Hz to 2000 Hz)

Accessories and Connectors

Included accessories

- Calibration certificate with test equipment verification as per ISO 9001 (manufacturer's calibration certificate)
- Instruction manual, getting started with imc CANSAS (one copy per delivery)

Optional accessories

Power adaptor		
CANFT/POWER-P	AC/DC power adaptor, 24 V DC, 60 W, PHOENIX, cable for CAN and power supply, LEMO.0B to DSUB-9, power supply via PHOENIX	12100023

Connector: signals		
ACC/FGG.1B.307.CLAD62ZN	plug for the signal connection (FGG series)	13500096
ACC/FEG.1B.307.CLAD62ZN	plug for the signal connection (FEG series), IP54	13500262
ACC/GMF.1B.062.072.EN	protective IP65 cover for the LEMO 1B plug (FGG series)	13500098
ACC/SENSORCABLE1-1M	signal cable 1 m LEMO.1B, IP54, unterminated cable end	13500255
ACC/SENSORCABLE1-2M	signal cable 2 m LEMO.1B, IP54, unterminated cable end	13500256
ACC/SENSORCABLE1-5M	signal cable 5 m LEMO.1B, IP54, unterminated cable end	13500257

CAN: cable and connector		
ACC/FGG.0B.305.CLAD56ZN	plug for the CAN connection (FGG series)	13500245
ACC/GMF.0B.035.060.EN	bend relief and sealing for LEMO 0B (FGG series), IP65	13500272
ACC/CABLE-LEMO-LEMO-1M	cable for CAN and power supply, 2x LEMO.0B, 1 m length	13500228
ACC/CABLE-LEMO-LEMO-2M5	cable for CAN and power supply, 2x LEMO.0B, 2.5 m	13500229
ACC/CABLE-LEMO-LEMO-5M	cable for CAN and power supply, 2x LEMO.0B, 5 m	13500259
ACC/CABLE-LEMO-DSUB-2M5	cable for CAN and power supply, LEMO.0B/DSUB, 2.5 m	13500230
ACC/CABLE-LEMO-DSUB-5M	cable for CAN and power supply, LEMO.0B/DSUB, 5 m	13500258
ACC/CABLE-LEMO-DSUB-BAN-2M5	cable for CAN and power supply LEMO.0B/DSUB power supply via banana, 2.5 m length	13500231
ACC/CABLE-LEMO-DSUB-PHOE-2M5	cable for CAN and power supply LEMO.0B/DSUB power supply via PHOENIX, 2.5 m length	13500261
ACC/CAP-LEMO.0B	dust protection for LEMO.0B	13500232
ACC/CAP-LEMO.1B	dust protection for LEMO.1B	13500233
ACC/CANFT-TERMI	CAN Terminator 120 Ω, LEMO.0B	13500242

Configuration package (USB)	
CANFT/USB-P	12100018
USB-CAN interface (CAN: DSUB-9, USB 2.0); AC/DC power adaptor, 24 V DC, 60 W, connection via PHOENIX; CAN and power cable LEMO.0B/DSUB Power supply via PHOENIX, 2.5 m; CAN Terminator 120 Ω, LEMO.0B; gender changer (DSUB-9) with integrated CAN terminator; imc CANSAS configuration software (via download), including COM library and LabVIEW (TM) VI	

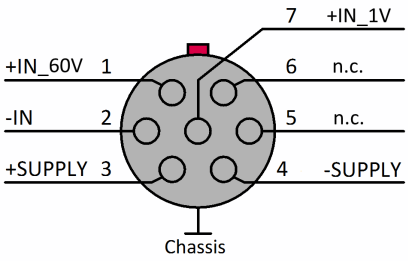
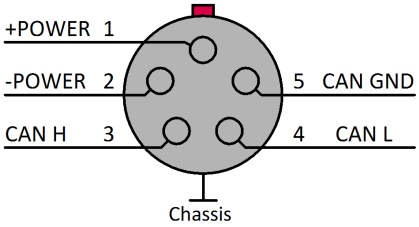
Miscellaneous
Calibration report set for each device; report set with manufacturer's calibration certificate and individual readings, as well as list of test equipment used; meets requirements of ISO 17025.

Technical Specs - µ-CANSAS-V1

Parameter	Value typ.	min. / max.	Remarks
Channels	1		
Measurement modes	voltage measurement voltage with divider		Input +IN_1V, -IN_COM Input +IN_60V, -IN_COM
Sampling rate	2 kHz		
Analog bandwidth	840 Hz		-3 dB
AD-conversion	24 Bit		
CANopen® Mode	"CiA® DS 301 V4.0.2" and "CiA® DS 404V1.2" supports 1 PDO in INT16, INT32, and FLOAT		
Input ranges	±1 V, ±500 mV, ±200 mV, ±100 mV ±60 V, ±20 V, ±10 V ±5 V, ±2 V		Input +IN_1V Input +IN_60V
Sensor supply	5 V, 10 V		max 210 mW, short-circuit-protected: 1 s
Isolation	60 V / 500 V		long-term / 10 s
Max. sustainable voltage	40 V / 100 V 100 V		Input +IN_1 V long-term / 1 s Input +IN_60 V long-term
Input configuration	DC, differential		Isolation to: case, power supply and CAN-Bus
Input impedance	5 MΩ 10 kΩ 900 kΩ		Input +IN_1 V Input +IN_1 V upon overvoltage, or deactivated Input +IN_60 V
Gain error	<0.05%		of measured value
Gain drift	2 ppm/K 3.5 ppm/K	10 ppm/K 30 ppm/K	ranges ≤±1 V ranges ≥±2 V
Offset	0.01%		of measured value
Offset drift	0.8 µV/K 4.4 µV/K	2 µV/K 20 µV/K	ranges ≤±1 V ranges ≥±2 V
Noise	1.6 μV_{rms} 115 μV_{rms}		range ±100 mV range ±2 V sampling rate: 2 kHz, R_{source} _q = 0 Ω
IMR (isolation mode rejection)	>120 dB (50 Hz) >100 dB (50 Hz)		ranges ≤±1 V ranges ≥±2 V R_{source} = 0 Ω
Sensor supply	5 V, 10 V		max. 210 mW, short-circuit proof 1 s
Accuracy of sensor supply	<5%		over entire temperature range

Power supply of the module			
Parameter	**Value typ.**	**min. / max.**	**Remarks**
Power supply		9 V to 50 V DC	
Power consumption	1 W	1.5 W	

Operating conditions		
Parameter	**Value**	**Remarks**
Operating temperature	-40°C to 120°C	CAN/µ-V1-L/AS
Dimensions (W x H x D) with / without terminal connection	 40 x 20 x 82.5 / 70,5 mm 40 x 20 x 104 / 60 mm	 CAN/µ-V1-L CAN/µ-V1-AS
Weight	0.1 kg 0.08 kg	CAN/µ-V1-L CAN/µ-V1-AS

Parameter	**Value**	**Remarks**
Terminal connection		
CAN / Supply	2x LEMO 5-pin type: HGG.0B.305 1x 6-pin Autosport type: AS208-35PA	CAN/µ-V1-L CAN IN und OUT CAN/µ-V1-AS CAN OUT
Measurement input	1x LEMO 7-pin type: HGG.1B.307	CAN/µ-V1-L
LEMO pin configuration	input CAN/µ-V1-L, LEMO.1B:  	CAN / supply; CAN/µ-B1-L, LEMO.0B: 

Dimensions

imc µ-CANSAS-V1-L