imc)

µ-CANSAS-T1

1-channel CAN-Module for measuring temperature

The µ-CANSAS-T1 is a 1-channel differential measurement amplifier with 24-bit A/D-conversion, which transforms an analog sensor into an intelligent, distinctly identified digital smart sensor. The conditioned and digitized signal from analog sensors can be output as a CAN- or CANopen® data stream. µ-CANSAS-T1 is particularly designed for use in extremely hot environments.
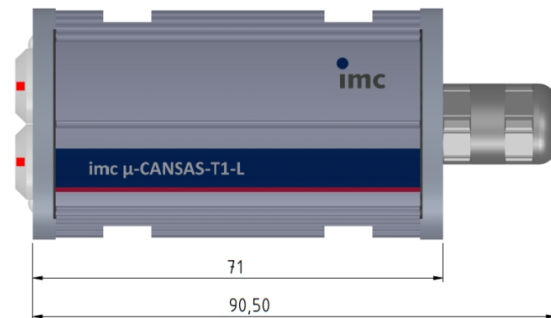
Highlights

- Ideal for temperature measurement with thermocouples
- 24-bit A/D-conversion

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 the available variants

Order Code	Article No.	Housing	Signal- connector	CAN- connector
CAN/µ-T1-L	11600001	µ-CANSAS profile	1x 8-pin Phoenix (MPT0,5/8) with waterproof cable grommet	2x 5-pin LEMO.HGG.0B.305
CAN/µ-T1-AS	11600008	µ-CANSAS profile	1x 8-pin Phoenix (MPT0,5/8) with waterproof cable grommet	1x 6-pin Autosport (AS208-35PA)

Shock 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

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, 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, 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-T1

Parameter	Value typ.	min. / max.	Remarks
Channels	1		
Measurement modes	Thermocouples type: B, E, J, K, N, R, S, T		Input: +IN_1V, -IN_COM
Sampling rate / channel	100 Hz		
Analog bandwidth	20 Hz		-3 dB
AD-conversion	24 Bit		
Isolation	60 V / 500 V		long-term / 10 s
Max. sustainable voltage	40 V / 100 V		long-term / 1 s
Input configuration	DC, differential		isolation to: frame, power supply and CAN-Bus
Input impedance	5 M		Input: +IN
	10 k		Input: +IN upon overvoltage, or deactivated
Diagnostics	open sensor detection		data output upon detected wiring error: lower end full scale (negative)
Measurement error	<±0.6 K		Type: J, T, K, E (for all other types, the voltage measurement uncertainties apply; see Technical Specs µ-CANSAS-V1)
Temperature drift	$±0.024 \text{ K/K·}\Delta T_a$		$\Delta T_a = |T_a - 25°C|$ ambient temperature T_a
Error of cold junction compensation	<±0.3 K		tightly sealed screw connection
Drift of cold junction	$±0.005 \text{ K/K } \Delta T_j$		$\Delta T_j = |T_j - 25°C|$ cold junction temp. T_j

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	
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-T1-L CAN/µ-T1-AS
Weight	0.1 kg 0.08 kg	CAN/µ-T1-L CAN/µ-T1-AS

Terminal connection	Value	Remarks
CAN / Supply	2x LEMO 5-pin type: HGG.0B.305 1x 6-pin Autosport type: AS208-35PA	CAN/µ-T1-L CAN IN und OUT CAN/µ-T1-AS CAN OUT
Measurement input	1x 8-pin Phoenix strip terminal	(MPT0,5/8)