

imc CANSASfit-T-10

10-channel measurement module for temperature measurement

The T-10 CANSASfit is a 10-channel module for the measurement of temperatures with thermocouples. The digitalized readings are output via CAN-Bus.



CANFT/T-10-K



CANFT/T-10-K with protective cover

Highlights

- Per-channel isolated measurement inputs, individual filtering and ADCs
- Individual cold junction compensation (CJC) per channel
- Universal version available that suits all thermocouple types
- High temperature durability
Operating temperature: -40°C to +125°C
- Sealed against dust and moisture as per IP65
- Robust, compact and miniaturized
- Click mechanism providing both mechanical and electrical coupling

Typical applications

Robust test and measurement for mobile applications at high temperatures and in rugged environments. Particularly on-board vehicles such as in drive tests, under the engine hood.

imc CANSASfit general functionalities and specifications

As a CAN-Bus-based test and measurement tool, the imc CANSASfit series offers a selection of measurement modules which precondition and digitize sensor signals and output these as CAN-messages. Their design, the resistance to extreme environmental conditions and the supported sensors and signals make them particularly suited for applications in the fields of automotive engineering, vehicle testing, road trials and measurements on mobile machines.

imc CANSASfit modules can be mechanically and electrically attached to each other by means of a click mechanism. When the module connectors are open, this is accomplished without the need for tools and without additional connecting cables.

Application fields

- Ideal for vehicle testing and road trials
- Deployable in both distributed installations and centralized measurement setups
- Operable with CAN interfaces and CAN data loggers from either imc or third-party suppliers

Properties and capabilities

Operating conditions:

- Operating temperature: -40°C to +125°C, condensation allowed
- Ingress protection rating: IP65
- Pollution degree (internally): 2; according to IEC 61010-1:2010
- Shock resistance in accordance with MIL STD810F

CAN-Bus:

- Configurable Baud-rate (max. 1 Mbit/s)
- Default configuration ex-factory: Baud rate=500 kbit/s and IDs: Master=2, Slave=3
- Galvanically isolated

Sampling rates and synchronization:

- Configurable CAN data rate
- Simultaneous sampling of all module's channels

Power supply:

- Wide range supply voltage, see technical specs
- LEMO.0B.305 sockets (IN / OUT) in conjunction with CAN-Bus signals

Onboard signal processing (depending on module type):

- Low pass filter
- Anti-Aliasing Filter (AAF) automatically adapted to the output rate
- Averaging filter
- Multi functional status LED, global or channel-wise (depending on module type)

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)

fit-series: versatile, click-together module block assemblies

Click mechanism:

- Multiple modules connected in a central block: mechanically and electrically (CAN and power supply)
- No need for tools or additional connection cables
- To maintain the degree of protection, the assembly of a complete system consisting of several modules must be carried out in a controlled environment (e.g. also sealing cap for click connectors).

Mounting options:

- Fastening eyelets provided for installation with cable ties, screws or bolts



imc CANSASfit modules connected in a block
(click mechanism)



Latching mechanism and
protective cover for click mechanism

Software

Configuration:

- Using imc CANSAS software (free of charge), including dbc-export
- Autostart with saved configuration; also pre-configurable at factory

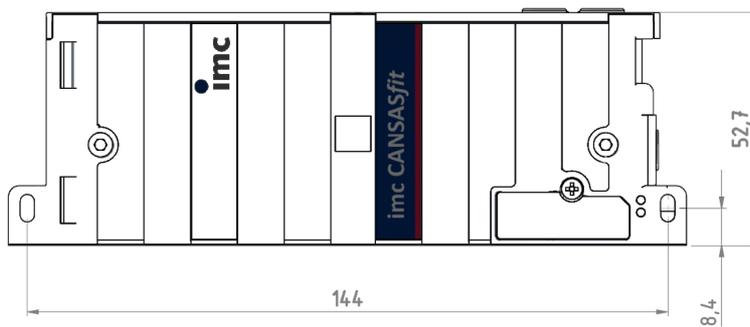
Measurement operation:

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

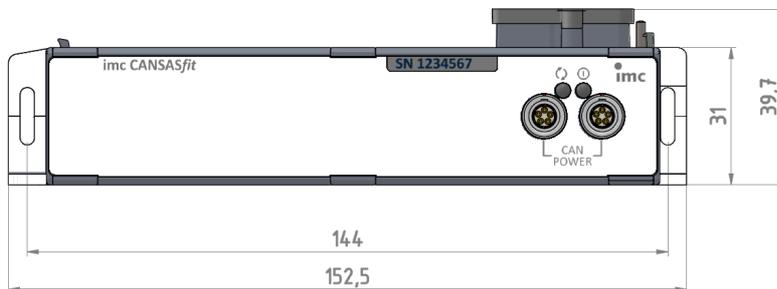
Models and Options

Order Code	signal connection	CAN connection	article number
CANFT/T-10	miniature thermocouple terminal connector universal: type K, J, T, E, L, N (white)	LEMO.0B.305	12100021
CANFT/T-10-K	miniature thermocouple terminal connector type K (green)	LEMO.0B.305	12100001
CANFT/T-10-J	type J (white)	LEMO.0B.305	12100019
CANFT/T-10-T	type T(white)	LEMO.0B.305	12100020
CANFT/T-10-N	type N (rosa)	LEMO.0B.305	12100033

Mechanical drawings with dimensions



Module shown in standard operating position (terminal connections upwards)



Included accessories

Documents
Getting started with imc CANSASfit (one copy per delivery)
Device certificate
Miscellaneous
10x ACC/CAP-TC, 13500243 (protective cover for miniature thermocouple terminal socket)
2x ACC/CAP-LEMO.0B, 13500232 (protective cover for LEMO.0B sockets)

Optional accessories

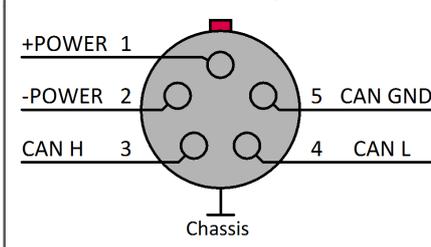
Power supply: AC/DC power adaptor (imc CANSASfit power set)		
CANFT/POWER-P	AC/DC power adaptor, 24 V DC, 60 W, PHOENIX, cable for CAN and power supply, LEMO.0B to DSUB-9, power supply via PHOENIX	12100023
CAN: cable ¹ and connector		
ACC/FGG.0B.305.CLAD56ZN	plug for the CAN connection (FGG series ²)	13500245
ACC/GMF.0B.035.060.EN	protective IP65 cover for LEMO 0B plug (FGG series ²)	13500272
ACC/CABLE-LEMO-LEMO-2M5	CAN + Power cable 2x LEMO.0B 2.5 m	13500229
ACC/CABLE-LEMO-DSUB-2M5	CAN + Power cable LEMO.0B/DSUB 2.5 m	13500230
ACC/CABLE-LEMO-DSUB-BAN-2M5	CAN + Power cable LEMO.0B/DSUB/PWR power supply via banana, 2.5 m	13500231
ACC/CABLE-LEMO-DSUB-LEMO-1B	CAN + Power cable LEMO.0B/DSUB power supply via LEMO.1B.302 for the 15V/24V power adaptor (e.g. CRPL/AC-ADAPTER-60W): G-coded	13500368
ACC/CABLE-LEMO-DSUB-LEMO-1BE	CAN + Power cable LEMO.0B/DSUB power supply via LEMO.1B.302 for 48 V power adaptor (ACC/AC-ADAP-48-150-1B): E-coded	13500296
ACC/CABLE-LEMO-LEMO-PWR-0M5	CAN + Power cable 2xLEMO.0B 0.5 m, with power supply for separate segments via banana jacks	13500324
ACC/CAP-LEMO.0B	protective IP65 cover for the LEMO 0B socket	13500232
ACC/CAP-TC	protective IP65 cover for miniature thermocouple terminal socket	13500243
ACC/CANFT-TERMI	CAN Terminator 120 Ω, LEMO.0B plug	13500242
ACC/CANFT-RESET	CAN Reset plug, manual reset via click connector	13500421
Mounting accessories		
CANFT/BRACKET-DIN	Mounting on DIN-Rail (top hat rail) imc CANSASfit	12100029
CANFT/BRACKET-MAG	Mounting with magnet system for imc CANSASfit	12100030
imc CANSASfit configuration package (USB)		
CANFT/USB-P	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 (download), including COM library and LabVIEW (TM) VI	12100018

To maintain the degree of protection, the assembly of a complete system consisting of several modules must be carried out in a controlled environment (e.g. also sealing cap for click connectors). Further detailed instructions for handling can be found in "Getting Started" and in the manual for imc CANSAS modules.

- 1 other cable lengths available
- 2 The LEMO plug series FGG and the FEG series are both compatible with the module's terminals. The FEG plug model has an additional sealing lip which ensures an IP54 grade seal when connected. The protection rating provided by the FGG model when connected is IP50. The measurement module's protection rating remains at IP65. The FGG plug could additionally be equipped with a protection grommet (e.g. 13500098) to achieve the protection rating IP65 when connected.

Documents		
SERV/CAL-PROT	Calibration protocol per amplifier imc manufacturer calibration certificate with measurement values and list of calibration equipment used (pdf).	150000566
SERV/CAL-PROT-PAPER	Calibration protocol per amplifier (paper print) imc manufacturer calibration certificate with measurement values and list of calibration equipment used with signature and seal.	150000578
Device certificates and calibration protocols: Detailed information on certificates supplied, the specific contents, underlying standards (e.g. ISO 9001 / ISO 17025) and available media (pdf etc.) can be found on our website, or you can contact us directly.		

Technical Specs - CANFT/T-10

Inputs, measurement mode		
Parameter	Value	Remarks
Inputs	10	
Measurement mode	temperature measurement	thermocouple measurement
Connector / socket	compatible socket	recommended plug
Measuring input	miniature thermocouple terminal socket 2-pin, female	miniature thermocouple terminal connector 2-pin, male
CAN / power supply	LEMO.0B 5-pin	FEG.0B.305 (see optional accessories)
		

Measurement mode

Temperature measurement - thermocouple, module variant: CANFT/T-10[-TYP]			
Parameter	Value typ.	min. / max.	Remarks
Measurement mode	thermocouple type K, J, T, N type K, J, T, E, L, N, B, S, R		fix-variant: T-10-K, T-10-J, T-10-T, T-10-N universal variant: T-10 (UNI) max. 2 types simultaneously in the same configuration
Input ranges	-270 °C to +1370 °C		type K
	-210 °C to +1200 °C		type J
Input ranges	-270 °C to +400 °C		type T
	-270 °C to +950 °C		type E
	-200 °C to +900 °C		type L
	-270 °C to +1300 °C		type N
	45 °C to +1820 °C		type B
	-50 °C to +1760 °C		type S
	-50 °C to +1760 °C		type R
			output format: 16 Bit INT or 32 Bit FLOAT
	-100°C to +250°C		additional for all variants, output format: 16 Bit INT
Measurement error	±0.25 K	±0.5 K	-150°C up to upper measurement limit at 25°C
Measurement error type S, type R	±0.5 K	±1.0 K	+500 °C up to the upper measurement limit at 25 °C

Temperature measurement - thermocouple, module variant: CANFT/T-10[-TYP]			
Parameter	Value typ.	min. / max.	Remarks
Deviation of cold junction compensation module variant: T-10-K, T-10-T, T-10-J, T-10-N module variant: T-10 (UNI)		± 0.25 K ± 0.5 K ± 0.5 K ± 0.75 K	operating temperature -20°C to $+105^{\circ}\text{C}$ other operating temperatures operating temperature -20°C to $+105^{\circ}\text{C}$ other operating temperatures
Drift	± 8 ppm/K $\cdot\Delta T_a$ $+60$ nV/K $\cdot\Delta T_a$		relating to the measured thermo voltage $\Delta T_a = T_a - 25^{\circ}\text{C} $
Noise	1.6 μV_{rms}		max. bandwidth
Common Mode Rejection Ration CMRR	140 dB		

Sampling rate		
Parameter	Value	Remarks
Sampling rate	≤ 100 Hz	configurable, individually per channel
Bandwidth	33 Hz	-3 dB
	5 Hz	0.1 dB
Resolution	24 Bit	output format: 16 Bit INT or 32 Bit FLOAT

Isolation, Coupling			
Parameter	Value typ.	min. / max.	Remarks
Isolation CAN-Bus power supply input analog input channel-to-channel		± 60 V ± 60 V ± 60 V ± 60 V	against housing nominal; testing voltage: 300 V (10 s) nominal; testing voltage: 300 V (10 s)
Input coupling		DC	
Input configuration		differential, isolated	
Input impedance		> 850 k Ω	

Operating conditions

Operating conditions		
Parameter	Value	Remarks
Ingress protection class	IP65	dust- and splash water proof
Operating temperature range	-40°C to $+125^{\circ}\text{C}$	internal condensation temporarily allowed
Pollution degree	2	
Dimensions (L x W x H)	$153 \times 40 \times 53$ mm	including mounting flanges and click mechanism
Weight	0.26 kg	

Power supply of the module			
Parameter	Value typ.	min. / max.	Remarks
Input supply voltage		7 V to 50 V DC 9.5 V to 50 V DC	after power up upon power up under conditions of IP65 (humidity): max. 35 V
Power consumption	1.3 W	1.6 W	max. at input voltage 50 V
Power supply options	CAN/Power cable or via adjacent module		LEMO.0B, 5-pin module connector (click mechanism)

Max. number of modules for direct coupling (block size with click mechanism)		
Parameter	Value	Remarks
Max. number of modules	8	limited by termination of internal CAN-Bus backbone (click junction)

Pass through power limits for directly connected modules (click-mechanism)		
Parameter	Value	Remarks
Max. current	4 A	at 25 °C current rating of click connector
	$-20 \text{ mA/K} \cdot \Delta T_a$	derating with higher operating temperatures: T_a ; $\Delta T_a = T_a - 25 \text{ °C}$
Max. power	48 W at 12 V DC 96 W at 24 V DC	equivalent pass through power at 25 °C typ. DC vehicle voltage AC/DC power adaptor and installations
	24 W at 12 V DC 48 W at 24 V DC	at 125 °C

Available power for supply of additional modules via CAN-cable (LEMO.0B, "down stream")		
Parameter	Value	Remarks
Max. current	6.5 A	at 25 °C current rating of LEMO.0B connection (CAN-IN, CAN-OUT); assuming adequate wire cross section
	$-15 \text{ mA/K} \cdot \Delta T_a$	derating with higher operating temperatures: T_a ; $\Delta T_a = T_a - 25 \text{ °C}$
Max. power	78 W at 12 V DC 156 W at 24 V DC	equivalent pass through power at 25 °C typ. DC vehicle voltage AC/DC power adaptor and installations
	60 W at 12 V DC 120 W at 24 V DC	at +125 °C