

imc CANSASfit HISO-HV-4

High voltage isolated 4-channel CAN-based measurement module for high voltages (HV)

Within the imc CANSASfit (CANFT) module series, the HISO series offers particularly highly isolated types that are specially designed for use in high voltage environments.

The model HISO-HV-4 is ideally suited for isolated measurements of high voltage signals up to 1500 V.



CANFT/HISO-HV-4

Highlights

- Highly isolated for measurement category 1000 V CAT II (according to safety standard DIN EN 61010)
- Test voltage: 5.4 kV AC_{rms}
- Channel by channel isolated measurement inputs, individual filter and ADC
- 400 Hz bandwidth at max. 1 kSps/channel sampling rate (CAN output rate)

- 24-bit digitization and internal processing
CAN-output format selectable: 16-bit or 32-bit FLOAT (24-bit mantissa)
- Click mechanism providing both mechanical and electrical coupling

Typical applications

- Testing in e-mobility environments (e.g., electric and hybrid vehicles)
- Measurement on battery modules and full stack HV batteries, DC link circuits in electric vehicles etc.
- Environments in which full personal safety must be guaranteed even in the event of faults.

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 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.

In deviation from the generally valid specification, no degree of protection (IP code) is defined for the CANFT/HISO products.

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 (above the maximum water depth/restricted degree of protection)
- 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

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 HISO connected with further imc CANSASfit Modules



Latching mechanism and protective cover for click mechanism

- The HISO module series differs from the other imc CANSASfit modules by its size (slightly raised and double width) and the degree of protection.

Software

Configuration:

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

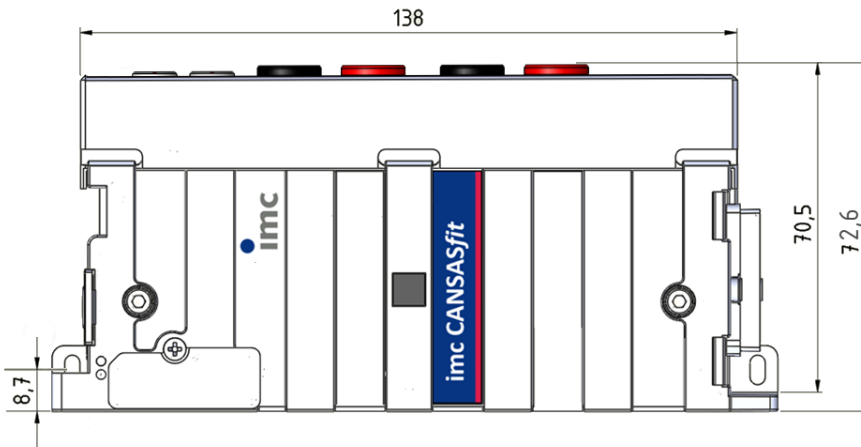
Measurement operation:

- 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

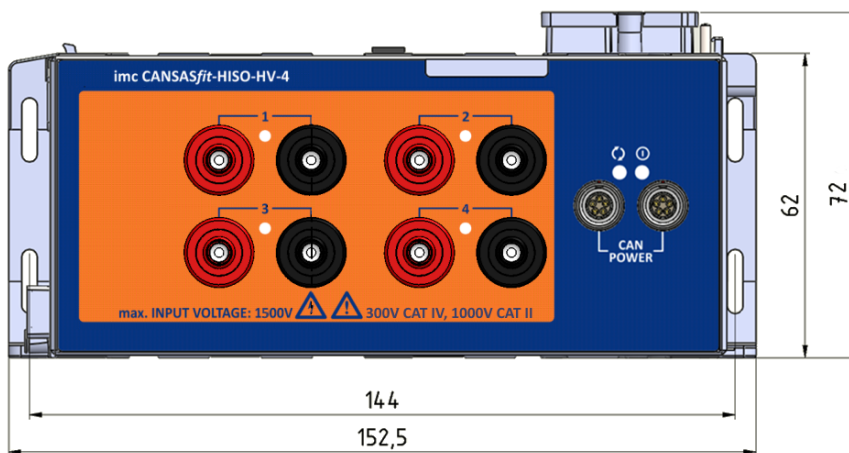
Available variants of imc CANSASfit HISO-HV-4

Order Code	Signal connection	CAN and power connection	article no.
CANFT/HISO-HV-4	8x laboratory safety sockets	LEMO.0B.305	12100043

Mechanical drawings



This representation of the module (with the connections facing upwards) is the preferred position for use.



Attention



- CANFT/HISO may only be operated in closed condition (click connector closed).
- The two protective covers must be mounted on the module connection ports when the modules are not coupled together.

Included accessories

Documents		
Getting started with imc CANSASfit (one copy per delivery)		
Device certificate		

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 via PHOENIX	12100023
CAN: cable ¹ and plugs		
ACC/FGG.0B.305.CLAD56ZN	plug for the CAN connection (FGG series ²)	13500245
ACC/GMF.0B.035.060.EN	protective cover for the LEMO 0B plug (FGG series ²), IP65	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 via banana	13500231
ACC/CABLE-LEMO-DSUB-PHOE-2M5	CAN + Power cable LEMO.0B/DSUB/PWR power via PHOENIX	13500261
ACC/CABLE-LEMO-DSUB-LEMO-1B	CAN + Power cable LEMO.0B/DSUB power supply via LEMO.1B.302 for 15V/24V power adaptor	13500368
ACC/CABLE-LEMO-DSUB-LEMO-1BE	CAN + Power cable LEMO.0B/DSUB power supply via LEMO.1B.302 E-coded for 48 V power adaptor	13500296
ACC/CABLE-LEMO-LEMO-PWR-0M5	CAN + Power cable 2xLEMO.0B 0.5 m, with power supply for separate segments via banana	13500324
ACC/CAP-LEMO.0B	protective cover for the LEMO 0B socket	13500232
ACC/CANFT-TERMI	CAN Terminator 120 Ω, LEMO.0B plug	13500242
Mounting accessories		
CANFT/BRACKET-DIN-XW	DIN Rail Mounting kit - extra-wide: for HISO types	12100039
CANFT/BRACKET-MAG-XW	Magnetic mounting kit - extra-wide: for HISO types	12100040
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
Miscellaneous		
Protocol Verification of the device safety test		

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 FGG plug could additionally be equipped with a protection grommet (e.g. 13500098).

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/HISO-HV-4



General

Inputs, measurement mode		
Parameter	Value	Remarks
Inputs	4	differential, analog
Measurement mode	voltage measurement	
Connector / socket	compatible socket type	recommended plug
CAN / power supply	LEMO.0B 5-pin	LEMO FEG.0B.305
Grounding / potential compensation	M4	
Measuring input	4 mm safety laboratory sockets	4 mm safety laboratory plugs
Module connector	Click-connection (protected)	for the supply and system bus (CAN) of directly connected modules without further cables

Sampling rate, Bandwidth, Filter			
Parameter	Value typ.	min. / max.	Remarks
Sampling rate	≤1 kHz		CAN output data rate; configurable, individually per channel
Bandwidth	0 Hz to 400 Hz		-3 dB; CAN output data rate = 1 kHz; anti-aliasing filter (AAF)
Filter	1 Hz to 200 Hz		digital filter
Cut-off frequency			-3 dB, in 1 - 2 - 5 steps
Characteristic	Moving average, Butterworth, Bessel, anti-aliasing filter		individual selectable; averaging and AAF: adapted automatically, according to selected output rate
Order	8 th		low pass filter
Anti-aliasing filter	Cauer 8 th order with $f_{\text{cut-off}} = 0.4 \cdot f_s$		$f_s = \text{CAN output data rate} \geq 1 \text{ Hz}$
Resolution	24 Bit		data output: 32 Bit Float or 16 Bit Integer

Isolation		
Parameter	Value	Remarks
Isolation	galvanically isolated	to system ground
CAN-Bus	±60 V	
power supply input	±60 V	
channel	1000 V	channel to channel, channel to CAN, channel to module power supply
measurement category	1000 V CAT II 600 V CAT III 300 V CAT IV	working voltage according to EN 61010-1, EN 61010-2-30
test voltage	5.4 kV RMS 9.6 kV 1.2/50 µs	according EN 61010-1 AC voltage test surge voltage test
pollution degree	2	according EN 61010-1, EN 60664-1

Coupling		
Parameter	Value	Remarks
Input coupling	DC	
Input configuration	isolated	differential

Status-LED		
Parameter	Value	Remarks
Power-LED green	 bicolor power active	
Status-LED green blue yellow red	 multicolor normal operating, run init, firmware update etc. prepare configuration error	overall status of module
Channel-Status-LED off green red	bicolor channel passive channel active over-range error	status for each channel signal exceeding nominal range by 5 % see manual for detailed information

Measurement mode

Voltage measurement			
Parameter	Value typ.	min. / max.	Remarks
Input range	±1500 V, ±1000 V, ±500 V, ±250 V, ±100 V, ±50 V		
Max. Over Voltage	±2000 V		overload of differential measurement input
Input impedance	20 MΩ 4 pF	±2%	
Gain error		0.05% + 0.005%/K·ΔT _a	of reading ΔT _a = T _a - 25°C
Offset error		0.05% + 0.0005%/K·ΔT _a	of range ΔT _a = T _a - 25°C
IMRR (Isolation mode rejection ratio)	84 dB		50 Hz
Noise, SNR	121 dB 115 dB 115 dB 115 dB 108 dB 102 dB		sampling rate = 1 kHz; filter = AAF; resolution = 32 bit Float; ranges: 1500 V 1000 V 500 V 250 V 100 V 50 V

Operating conditions

Parameter	Value	Remarks
Operating temperature range	-40°C to +85°C	internal condensation temporarily allowed (pollution degree 2)
Pollution degree	2	according DIN EN 61010-1, DIN EN 60664-1
External mechanical stress	IK08	
Shock- and vibration resistance	IEC 61373, IEC 60068-2-27 IEC 60062-2-64 category 1, class A and B	
Weight	approx. 0.7 kg	
Dimensions (L x W x H)	approx. 153 x 72 x 73 mm	including mounting flanges and click mechanism

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
Power consumption	1.5 W	<1.8 W	
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 +85 °C

Available power for supply of additional modules via CAN-cable (LEMO.0B)		
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 +85 °C