

imc CANSASfit-DI-16

16-channel digital input module

The DI-16, belonging to the imc CANSASfit-series, enables the capture of up to 16 digital input signals at a maximum sampling rate of 1 kHz. The capture of digital signals can be performed either bitwise or as data words for all inputs. Either 5 V or 24 V can be selected via the software as the logic level.



CANFT/DI-16

Highlights

- Rugged and compact structure
- Snaps together with other units to provide solid mechanical and electrical connection

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

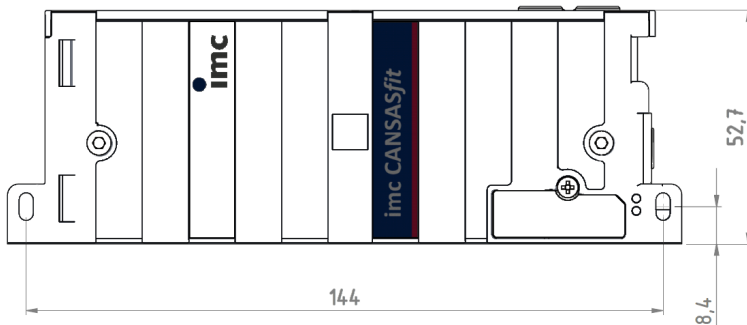
Measurement operation:

- Data logger operation:
 - Software: imc STUDIO
 - Hardware: imc measurement system with CAN-Interface, e.g. imc ARGUSfit, 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

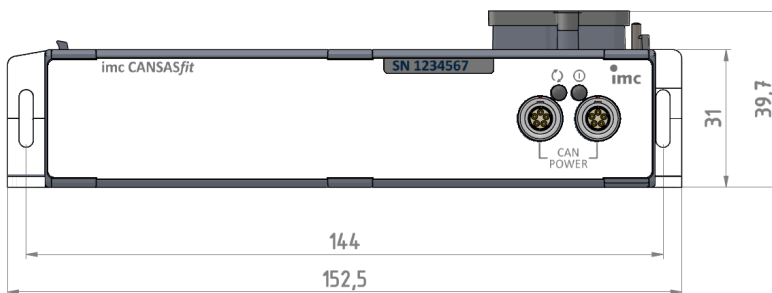
Available variants for DI-16

Order code	Signal connection	CAN connection	article number
CANFT/DI-16	LEMO.ENG.1B.307	LEMO.0B.305	12100006

Mechanical dimensions



This view of the module (with the connectors oriented upward) shows the preferred position for use.



Included accessories

Documents	
Getting started with imc CANSASfit (one copy per delivery)	
Device certificate	
Miscellaneous	
4x ACC/CAP-LEMO.1B, 13500233 (protective cover for LEMO.1B sockets)	
2x ACC/CAP-LEMO.0B, 13500232 (protective cover for LEMO.0B sockets)	

Optional accessories

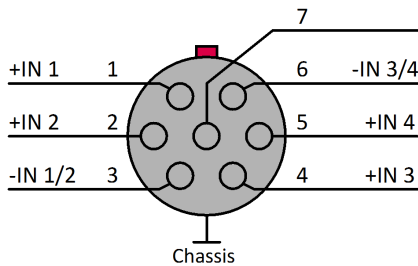
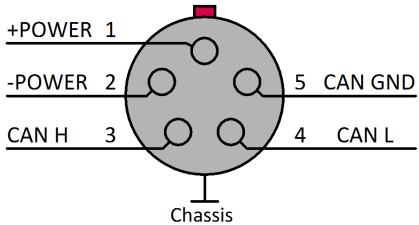
Power supply: AC/DC power adaptor (imc CANSASfit power set)		
CANFT/POWER-P	AC/DC power adaptor, 24 V DC, 60 W, PHOENIX, cable for CAN and power supply, LEMO.0B to DSUB-9, power supply via PHOENIX	12100023
Connector: signals		
ACC/FGG.1B.307.CLAD62ZN	plug for the signal connection (FGG series ¹)	13500096
ACC/FEG.1B.307.CLAD62ZN	plug for the signal connection (FEG series ¹), IP54	13500262
ACC/GMF.1B.062.072.EN	protective IP65 cover for the LEMO 1B plug (FGG series)	13500098

CAN: cable¹ 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-LEMO.1B	protective IP65 cover for the LEMO 1B socket	13500233
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		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 (download), including COM library and LabVIEW (TM) VI		

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 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.

Technical Specs - imc CANFT/DI-16

Inputs, measurement modes		
Parameter	Value	Remarks
Inputs	16	8 isolated groups of 2-bit channel
Measurement modes	voltage mode switch mode	configurable for each group separately
Interconnections CAN / Supply Measurement input	compatible connector type 5-pin LEMO.0B 7-pin LEMO.1B	recommended connector: LEMO.FEG.1B.307
LEMO pinout	Measurement input: 	CAN and power supply: 

Sampling rate		
Parameter	Value	Remarks
Sampling rate	≤1 kHz	output rate of the CAN-Bus data, individually per channel

Differential input		
Parameter	Value	Remarks
Input configuration	differential	the common reference of a group is the respective -IN terminal
Isolation strength	±150 V	to system ground (housing) and between groups (tested at: 200 V)
Input voltage level	TTL, 24 V	configurable for each group separately
Overvoltage protection	70 V	long-term, test voltage ±100 V (60 s)
Input impedance	2 MΩ	
Switch mode no-load voltage short-circuit current	max. 4 V max. 800 μA	measured between +IN and -IN of a channel
Voltage mode (thresholds) TTL (5 V) 24 V contact	1.4 V (±400 mV) 8.1 V (±800 mV) 2..7 kΩ	low-impedance contact at input = High

Operating conditions		
Parameter	Value	Remarks
Ingress protection class	IP65	dust- and splash water proof
Operating temperature range	-40 °C to +125 °C	internal condensation temporarily allowed
Pollution degree	2	
Dimensions (L x W x H)	153 x 40 x 53 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 under conditions of IP65 (humidity): max. 35 V
Power consumption	1.4 W	2.8 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 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