

DI16 for imc CANSASflex (CANFX/DI16)

CAN module for 16-bit digital inputs



imc CANSASflex-DI16

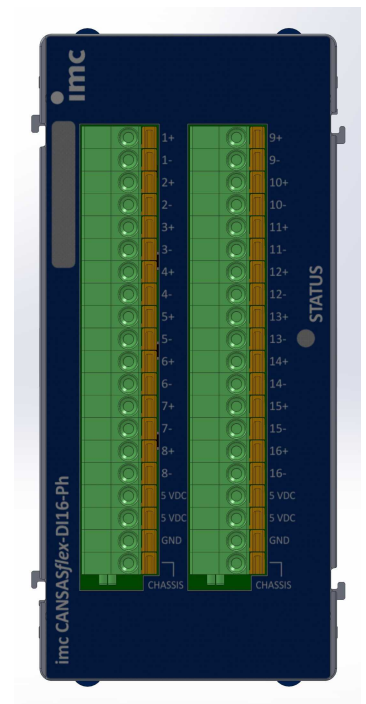
(Fig. similar)

The CAN-Bus module imc CANSASflex-DI16 allows the capture of up to 16 digital input signals at a maximum sampling rate of 10 kHz. The data can be captured either bitwise or as data words for all of the inputs; the module's input voltage can be selected in the software as either 5 V or 24 V.

The threshold values for evaluating the inputs' logic level can accordingly be software-selected for either 5 V or 24 V signals.

Features

- Selectable signal level: TTL or 24 V logic
- Galvanically isolated groups of 2 bits each
- Optocoupler with max. 0.8 mA input current
- Data captured either as an entire port or individual bits
- Logic operations and signal analysis by means of "virtual channels" already performed directly in the module



CANFX/L-DI16-Ph

General imc CANSASflex functions and specifications

As a CAN-bus-based measurement engineering tool, the imc CANSASflex series offers a wide selection of measurement modules which process and digitize sensor signals and output these as CAN-messages.

The modules of the imc CANSASflex series (CANFX) can be joined together mechanically and electrically by means of a latching ("click") mechanism, without the use of any tools nor the need for any extra cables, and also allows the CAN-logger imc BUSDAQflex (BUSFX) to dock on directly. Depending on the module type, they are available in either long (L-), short, or both housing versions.

Besides fixed installations or operation on a laboratory bench, the modules are also designed to fit in a special 19" subrack to provide a convenient solution in test station settings.

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 manufacturers

Properties and capabilities

Operating conditions:

- Operating temperature: -40°C to +85°C, condensation allowed
- Shock resistance: 50 g (pk over 5 ms)
- Ingress Protection: IP40 (only with optional protective cover on top of the locking slider, otherwise IP20)

CAN-Bus:

- Configurable Baud rate (max. 1 Mbit/s)
- Default configuration ex-factory: Baud rate=125 kbit/s and IDs: Master=2, Slave=3
- Galvanically isolated
- Built-in terminator resistance, manually switchable

Sampling rates and synchronization:

- Configurable CAN data rate
- Simultaneous sampling of all module's channels, as well as across multiple modules
- Synchronization of multiple modules as well as to a global CAN-logger: based on CAN messages (no Sync-signal required)

Power supply:

- Galvanically isolated power supply input
- DC 10 V to 50 V
- LEMO.0B connector (2-pin); alternative power supply via CAN connector (DSUB-9)

On-board signal processing:

- "Virtual channels": integrated signal processor (DSP) for online processing. Data reduction, filtering, scaling, calculations, threshold monitoring, etc.
- Programmable multi-functional status-LED, supporting linkage to virtual channels

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 messages)

flex-Series: flexible granulation, topology and block assemblies

Click-mechanism:

- Modules joinable to module-blocks: mechanically and electrically connected (CAN and power supply)
- No tools or additional cabling required
- With guide grooves, magnetic catches and locking slider
- Both short and long housing versions joinable:
with electrical connection: align on rear side; mechanically only: align on front side
- Direct connection of compatible CAN-logger: imc BUSDAQflex

19" rack solution (subrack):

- Modules designed for insertion into special 19" frames ("boom-box") for installation in test stations
- Rack backplane accommodates the power supply, CAN and slot information (automatically read out configuration information for use in automation software)

Mounting:

- Mountable by means of recessed threaded holes (M3), either individually or jointly as a block
- Rubber bumper rails providing secure placement in laboratory settings
- Various brackets and handles, and DIN top-hat rail mounting kit available as accessories



imc CANSASflex modules connected (Click-mechanism) in a block with imc BUSDAQflex Logger (left)



rear view of this block:
CAN, Power supply, Terminator, Locking slider

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";
4 TPDOs (Transmit Process Data Objects) in INT16, INT32 and FLOAT.
See "CANSAS CANopen®" for a detailed description of the supported features and settings.

Measurement operation:

- Data logger operation:

Software: imc STUDIO

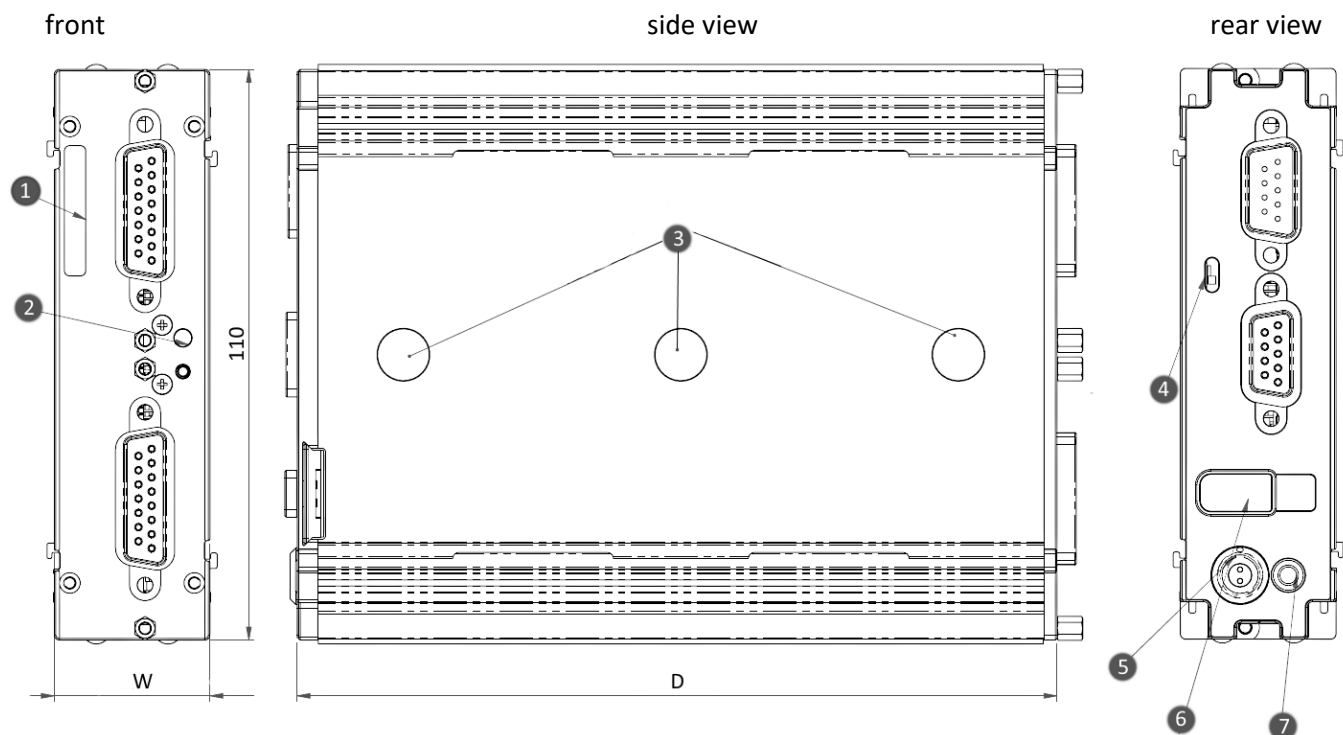
Hardware: imc measurement system with CAN-Interface, e.g. imc BUSDAQ, imc C-SERIES, imc SPARTAN and imc CRONOS device family (CRFX, CRXT, CRC, CRSL)

- With any desired CAN-interfaces and CAN-loggers from 3rd-party manufacturers

Overview of available variants for imc CANSASflex-DI16

Order Code	signal connection	option/extra	housing	article number
CANFX/DI16	DSUB-15		L0	12500034
CANFX/L-DI16	DSUB-15		L0	12500017
CANFX/L-DI16-Ph	Phoenix		S0	12500125

Dimensions



Shown in standard operating orientation: housing type L0; width (W) = 30 mm.

Housing type	S0	S1	S2	L0	L1	L2
W: Width	30 mm	50.3 mm	70.6 mm	30 mm	50.3 mm	70.6 mm
D: Depth	93 mm, with two magnets			146.5 mm, with three magnets		

Legend:

1: Serial number label
2: Status LED (blue / red)

3: magnet
(depending on model)
4: adjustable CAN terminator

5: supply socket (LEMO)
6: locking slider CAN/supply
7: ground connection M3

Included accessories

Documents	
Getting started with imc CANSAS (one copy per delivery)	
Device certificate	
Miscellaneous	
Grounding set consisting of: a spring washer S3 (stainless steel), a flat washer (A3.2 DIN 433 A2) and a pan-head screw M3x8 (mounted on the rear panel).	

Optional accessories

AC/DC power adaptor 110-230V AC (with appropriate LEMO plug)		
ACC/AC-ADAP-24-60-0B	24 V DC, 60 W, LEMO.0B.302	13500246
Power plug		
ACC/POWER-PLUG3	Power connector for DC supply LEMO FGG.0B.302, solder contact, max. 0.34 mm ²	13500033
ACC/CABLE-LEMO-0B-BAN-2 M5	Power supply cable LEMO/banana 2.5 m	13500276
DSUB-9 plug (CAN)		
CAN/RESET	Reset-plug (DSUB-9 female)	10500025
CAN/KABEL-TYP2	CAN-Bus connection cable 2x DSUB-9 1:1, 2 m length	10500027
DSUB-15 plug		
ACC/DSUBM-DI2-8	DSUB-15 plug for digital inputs	13500172
Handle		
CANFX/HANDLE-L	CANFX handle kit (left and right) - long (L)	12500028
Mounting brackets for fixed installations		
CANFX/BRACKET-CON-L	CANFX connection bracket long	12500020
CANFX/RACK	19" Rack	12500094
CANFX/RACK-BLOCK	19" Rack frame for entire block CANFX/BUSFX	12500103
Mounting brackets for DIN Rail		
CANFX/BRACKET-DIN-L0	CANFX DIN Rail mounting bracket - Type L0	12500024
Miscellaneous		
CANFX/RUBBER-1M	silicone strip blue 1 m	12500029
CANFX/COVER-IP40	protective cover on top of the locking slider in compliance with IP40 ingress protection class	12500069
CANFX/USB-P	USB-CAN interface (CAN: DSUB-9, USB 2.0); AC/DC power adaptor, 24 V DC, 60 W, with LEMO.0B plug; CAN cable, DSUB-9 (F, terminated) - DSUB-9 (M, terminated); CAN reset plug; imc CANSAS configuration software (download)	12500043

Technical Specs - CANFX/DI16

Parameter	Value	Remarks
Inputs	16 digital inputs	Common reference ground for each 2-channel-group. Each 2-channel-group isolated to other groups as well as to power supply and CAN-Bus.
Input voltage range	TTL or 24 V	software-configurable
Sampling rate	max. 10 kHz	
Input configuration	differential	isolated to power supply and channel-to-channel
Input current	< 0.8 mA	current source drive (min. current 0.1 mA)
Switching threshold		
5 V operation (TTL)	$V_{Lmax} = 0.8 \text{ V}; V_{Hmin} = 2.0 \text{ V}$	typ. 1.7 V \pm 200 mV
24 V operation	$V_{Lmax} = 5.0 \text{ V}; V_{Hmin} = 8.0 \text{ V}$	typ. 6.7 V \pm 300 mV

General		
Parameter	Value	Remarks
Isolation:		to case (CHASSIS)
CAN-Bus	$\pm 60 \text{ V}$	nominal; testing: 300 V (10 s)
power supply input	$\pm 60 \text{ V}$	nominal; testing: 300 V (10 s)
digital inputs	$\pm 60 \text{ V}$	nominal; testing: 300 V (10 s)
Overvoltage protection	$\pm 60 \text{ V}$	differential input voltage
CAN-Bus	defined as per ISO 11898	
CANopen [®] mode	"CiA [®] DS 301 V4.0.2" and "CiA [®] DS 404V1.2"	supports 4 PDOs in INT16, INT32, and FLOAT

Terminal connections		
Parameter	Value	Remarks
Supply input	type: LEMO.0B (2-pin)	compatible with LEMO.EGE.0B.302 multicoded 2 notches for optional individually power supply compatible with connectors FGG.0B.302 (Standard) or FGE.0B.302 (E-coded, 48 V) pin configuration: (1)+SUPPLY, (2)-SUPPLY
Module connector	via locking slider	for power supply and networking (CAN) of directly connected modules (Click-mechanism) without further cables
CAN bus	2x DSUB-9	CAN and power supply CAN_IN (male) bzw. CAN_OUT (female) all signals on both DSUB-9 directly 1:1 connected

Operating conditions		
Parameter	Value	Remarks
Ingress protection class	IP40	only with optional protective cover (CANFX/COVER-IP40) on top of the locking slider, otherwise IP20
Operating temperature range	-40°C to 85°C	internal condensation temporarily allowed

Power supply			
Parameter	Value typ.	min. / max.	Remarks
Input supply voltage	10 V to 50 V DC		
Power consumption	4 W		
Module power supply options	power socket (LEMO) CAN socket (DSUB-9) adjacent module		direct connection imc CANSASflex or imc BUSDAQflex

Pass through power limits for directly connected modules (Click-mechanism)		
Parameter	Value	Remarks
Max. current	8 A	at 25°C current rating of the click connector
	$-50 \text{ mA/K} \cdot \Delta T_a$	Derating with higher operating temperatures T_a , $\Delta T_a = T_a - 25^\circ\text{C}$
Max. power	96 W at 12 V DC	Equivalent pass through power at 25°C typ. DC vehicle voltage
	192 W at 24V DC	AC/DC power adaptor or cabinets
	60 W at 12 V DC 120 W at 24V DC	at +85°C

Available power for supply of additional modules via CAN-cable (DSUB-9, "down stream")		
Parameter	Value	Remarks
Max. current	6 A	at 25°C current rating of DSUB-9 connection (CAN-IN, CAN-OUT); assuming adequate wire cross section!
	$-30 \text{ mA/K} \cdot \Delta T_a$	Derating with higher operating temperatures T_a , $\Delta T_a = T_a - 25^\circ\text{C}$
Max. power	72 W at 12 V DC	Equivalent pass through power at 25°C typ. DC vehicle voltage
	144 W at 24 V DC	AC/DC power adaptor or cabinets
	50 W at 12 V DC 100 W at 24 V DC	at +85°C