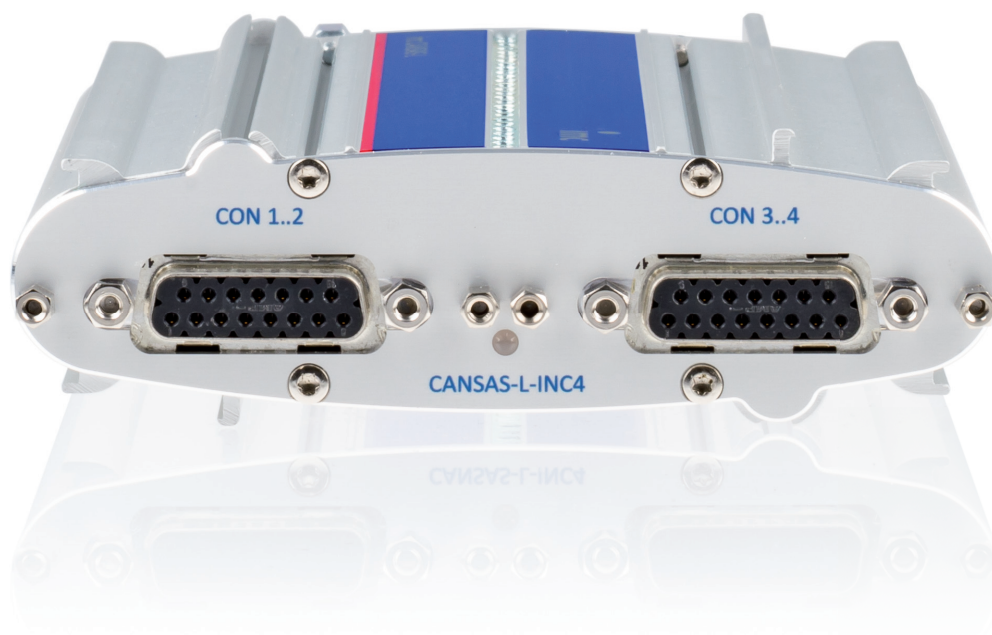


imc CANSAS

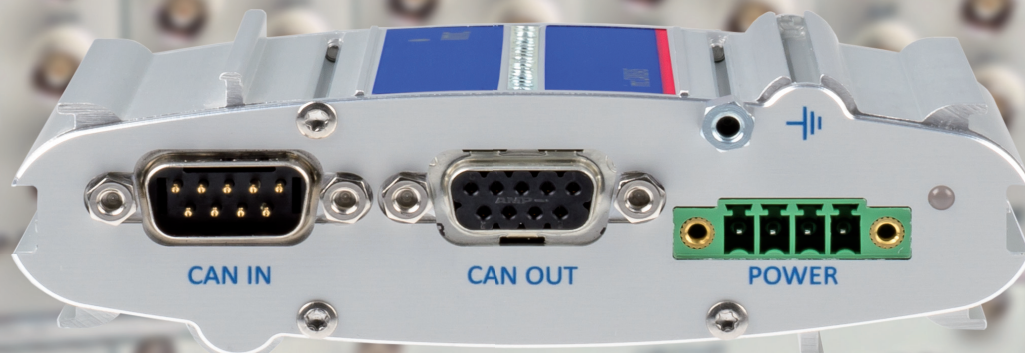
configurable • distributable • universal



Intelligent measurement modules for test stands and mobile applications

imc CANSAS at a glance

- Universal measurement and I/O modules for all relevant sensors and signals
- Easily integrates in every CAN-based testing thanks to a standard CAN interface
- Distributed or centralized operation
- Time-synchronized measurements across module borders
- Intelligent testing by calculating results and data reduction directly within the module
- Five different housing types suitable for any testing environment
- Connections according to customer: DSUB, LEMO, ITT Veam, BNC, thermocouple, ...
- Suitable for extreme environmental conditions
- Configuration software included: allows you to export the module configuration in the standard DBC format



imc CANSAS

CAN modules for mobile, industrial or test stand applications

Whether test stand, on-board vehicle application or industrial environment - any place a time-synchronous, dynamic or decentralized acquisition of large channel counts is required - imc CANSAS modules are ideal.

Equipped with the most up-to-date, high-precision measurement amplifiers, imc CANSAS modules allow for direct connection to all typical sensors and signals in the mechatronic environment. The digitized measurement signals exit as CAN messages and can be read and recorded by any measurement, automation or control system with a CAN interface. Additionally, imc CANSAS modules can operate in extended temperature ranges and endure strong vibrations and shocks.

Intelligent functioning makes the difference

Precise synchronization of data acquisition is always guaranteed for all channels, including over module boundaries: using CAN-based clock-synchronization, imc CANSAS succeeds without additional signal lines - just the standard CAN bus cable.

Thanks to integrated sensor recognition (TEDS), a secure sensor connection and flawless configuration are guaranteed.

With the heartbeat function, the bus master can constantly monitor modules, such as control or automation systems. You will know whether the module is still connected, is working with the correct configuration and whether the modules with automatic sensor recognition are connected with the right sensor.

Central or distributed operation

In test stands or in a power station, a centralized design of the measurement system is often desired. The imc CANSAS modules can be inserted into a rack configuration or module holder.

For widely distributed measurement points, the ability to capture and digitize signals near the sensor is quite advantageous. imc CANSAS measurement modules can be placed directly next to the sensor and connected to a network with standard CAN cable - up to 1000m away. This eliminates the laying of expensive test leads. At the same time, the quality is increased by a noise-free digital transmission.



Voltage & high voltage



Current



Temperature



Strain Gauge



Pressure



Frequency speed/angle



Digital input/output



PWM-output



Analog output

Productive testing with imc CANSAS

Universal signal connections

- Direct connection of all typical signals and sensors in electromechanical testing
- Integrated signal conditioning, anti-aliasing filter and optional sensor supply
- Supports automatic sensor recognition (TEDS)
- Precise digitization and locally occurring evaluations and preprocessing

The appropriate housing for every application

- Five different designs for every application: From measurements in the engine compartment at 120°C to permanent installations on test stands
- Wide temperature range of -40/-30°C (type permitting) to + 85°C with allowed condensation; versions available for even the most extreme temperatures of -40C to +120C
- Compact module design allows for near-sensor placement and reduces potential electrical interference

Simple configuration

- Configurable via imc STUDIO, imc CANSAS or CANOpen

- Direct access to all relevant CAN parameters (baud rate, ID type, message ID, etc.)
- Configuration of real-time calculations in the module and output as virtual channels
- Configuration is saved onboard and loaded when the module is switched on

Simple integration

- Fully supports CAN specification (ISO 11898)
- Extensive configuration options for user-specific CAN settings
- Extensive heartbeat function for unattended operation in CAN networks
- Import and export of module configurations using the industry standard DBC

Always synchronously measured

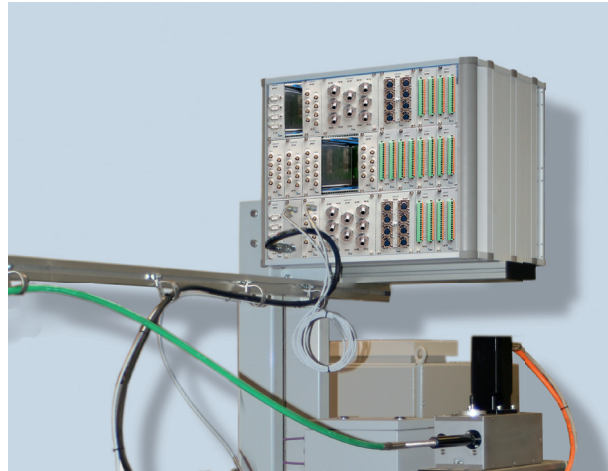
- CAN-based synchronization for sample-exact measurements across module boundaries
- Synchronization requires no additional cables



In Practice

Compatible test stand expansion

On test stands, adaptable and easy to integrate measurement hardware is required. The flexible, modular concept of imc CANSAS is the ideal solution. From universal modules that can measure voltage, current, temperature or strain, up to special modules for pressures, high voltage or high isolation - the choice is yours. Depending on the task, the correct measurement module can be easily slipped into the rack. This automatically powers the module and connects it to the CAN bus. During operation, modules can be added or replaced.



Robust in mobile applications

Even under harsh environmental conditions in mobile applications, imc CANSAS precisely measures throughout a wide temperature range of -40°C or -30°C to $+85^{\circ}\text{C}$ and can tolerate condensation passing through dew point. In the SL-version, the modules are built according to IP65 and MIL-STD-810F and are impervious to dirt, splashing water, vibrations and shocks. For operations in the engine compartment with temperature ranges between -40°C to $+120^{\circ}\text{C}$, the very lightweight imc μ -CANSAS modules are ideal. Once configured, imc CANSAS systems automatically provide data when power is applied.



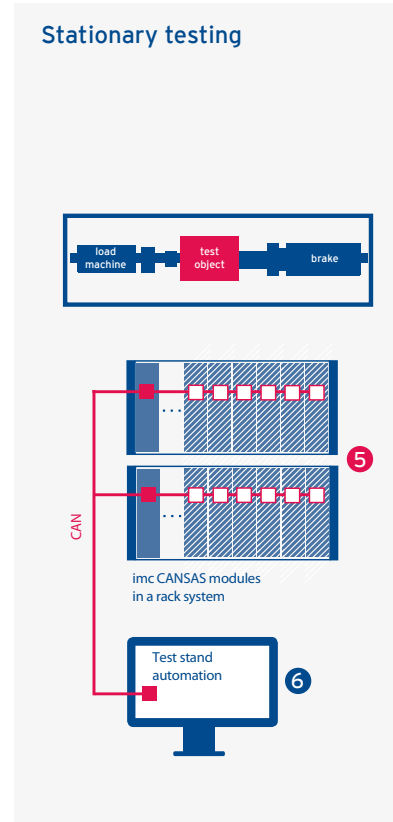
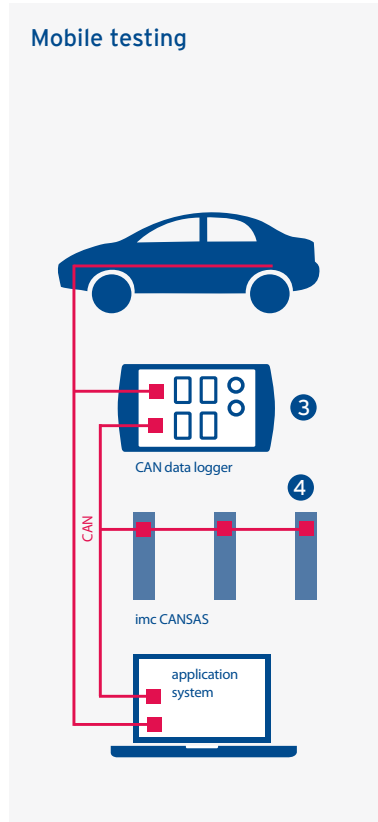
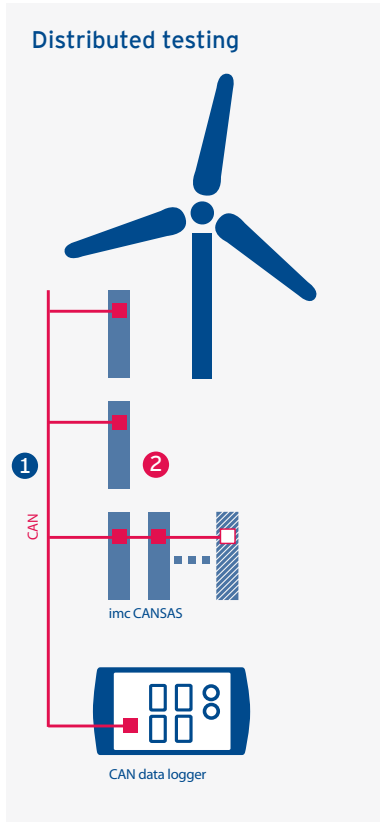
Distributed tests and measurements

For widely distributed measuring points, such as on trains, ships, aircraft, cranes, wind turbines or construction sites, the cost of sensor wiring is high. In addition, long, multi-core test leads are expensive and prone to interference and signal noise.

Here, imc CANSAS shows its advantages. Thanks to the compact housing and autarkic operation and supply designs, each measurement module can be placed close to the sensor. The detected signals are transmitted digitally and galvanically-isolated via CAN (up to 1000m) and are synchronously recorded with, e.g., an imc data acquisition system.



Ideal for centralized and distributed measurements in mobile or stationary testing



1 CAN network up to 1000m

2 Spatially-distributed measurement modules

3 CAN data logger (e.g., imc BUSDAQ) for autarkic data acquisition without a PC

4 Individual modules can be powered via CAN

5 imc CANSAS 19"rack with integrated CAN-backplane for power supply and data communication

6 Connects to all data acquisition systems or automation systems with CAN interface

The imc CANSAS housing designs



Standard version



Standard version (long)



Cassette version



SL version



µ-CANSAS version

System Design

The imc CANSAS module family

imc CANSAS is designed for test and measurement tasks on test stands, power stations, vehicles and construction sites. A variety of input and output modules cover the full range of electromechanical testing requirements:

Universal input module for testing:

- Voltage
- Current
- Strain gauge/bridges
- Temperature

Special measurement modules for testing:

- High-voltages up to 800V
- Temperatures and low voltages at high potentials (personnel-safety from high-isolation testing)
- Pressure testing (relative/absolute)

Digital measurement modules

- Digital inputs (TTL or 24V)
- Frequency/counter inputs (incremental encoder)

Output modules

- Digital outputs (TTL and 24V power driver or relay contacts)
- Analog outputs ($\pm 10V$ and $0 \dots 20mA$)
- PWM outputs

EtherCAT/EtherNET over CAN

- RS232 over CAN
- SENT over CAN



The imc CANSAS housing designs

Whether stationary or mobile, whether in the laboratory or a rock quarry - with five different fanless housing types, the imc CANSAS can be optimally adapted to any respective testing environment.

Standard version

The standard version is ideal for universal use. The fanless aluminum housing serves as a heat sink and as a mounting platform. Multiple modules can be combined tool-free with the tongue and groove design to form a unit or block with an optional mounting plate on the rail.

Standard version (long)

The long standard version has the same features as the shorter version and can also be inserted into an imc CANSAS rack.

Cassette version

On the test bench or in power stations - anywhere that multiple imc CANSAS modules are designed to be permanently mounted - the cassette version is recommended. In conjunction with the imc cassette sub-rack, this version offers a convenient plug-in module with automatic power supply and connection to the CAN bus.

SL version

For measurements that are made in extreme conditions such as dust, dirt, moisture or strong vibrations, the imc CANSAS-SL modules are ideally suited. They have IP65 protection and are shockproof according to MIL-STD-810. With waterproof DSUB or LEMO connectors, a secure signal connection is ensured, even under adverse conditions.

imc μ -CANSAS version

imc μ -CANSAS modules are suitable for extreme environments, such as testing in the engine compartment at up to 120°C. They have IP65 protection and are very small and lightweight.

imc CANSAS product family

A suitable module for every task

Universal

Measurement module for universal testing

- Voltage and current
- Thermocouples
- PT100
- Strain gauges/measurement bridges
- Resistance



Strain gauges & measurement bridges

Precise strain testing

- Quarter-, half-, and full-bridge
- 120 Ω or 350 Ω supplemental resistance
- Integrated sensor supply



Temperature (HV)

High-isolated temperature measurements

- Thermocouples up to 800V levels
- eMobility and hybrid applications
- Individual HV-appropriate connectors



Pressure

Integrated pressure sensors

- 8 pressure inputs of different types
- Absolute and relative pressure measurements
- Gases and liquids



High isolation

Testing with high potentials

- Isolation: 800 V CAT I, 300 V CAT II
- Measure low voltages and temperatures under high common-mode levels
- High-voltage measurements up to 800V



Digital inputs & outputs

Detect and set conditions

- 16 galvanically-isolated inputs and outputs
- Inputs configurable for 24 V and 5 V (TTL/CMOS)
- Outputs can be configured as open-drain or totem-pole
- Output current max. 0.7A
- Alternative: relay contacts

Outputs

Open- and closed-loop control

- Analog outputs $\pm 10V$, 0 ... 20mA
- Integrated function generator for, e.g., squaring, sawtooth, etc.
- PWM outputs with TTL and open-drain output stage

Counter inputs

Incremental encoder measurements for determining:

- Frequency
- RPM
- Velocity
- Position and angle

Gateways

Digital interfaces in CAN

- RS232 gateway for conversion to CAN
- SENT Gateway with 8 inputs to connect SENT sensors and output to CAN



Rack

imc CANSAS modules fit perfectly in a rack
- e.g. for test stand applications



imc CANSAS Details

imc CANSAS general specs and functions

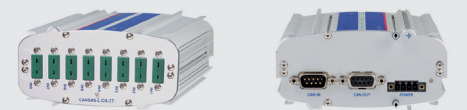
| | |
|--|---|
| CAN | |
| CAN bus (CiA® Draft Standard 102 Version 2.0) | ● |
| Software selectable baud rate (max. 1 Mbit/s) | ● |
| Galvanically isolated CAN interface | ● |
| Stand-alone capabilities | |
| Onboard data processing and reduction (virtual channels) | ● |
| Heartbeat messaging | ● |
| Autostart with stored configuration | ● |
| Synchronization & clock | |
| Master-slave via CAN messages | ● |
| Via decidedly SYNC signal | ● |
| Power supply | |
| DC input 10V to 50V | ● |
| AC/DC adaptor (110 to 230VAC) | ○ |
| Alternative power input via CAN connector | ● |
| Isolated power supply input | ● |
| Configuration software | |
| imc CANSAS software included | ● |
| CANopen supported (CiA® DS 301 V4.0.2 / DS 404V1.2) | ● |
| imc Plug and Measure (TEDS, IEEE 1451.4) | ● |
| Configuration via PC CAN interface (USB, PCI etc.) | ● |
| Configuration via an imc device CAN interface (imc STUDIO) | ● |
| Configuration via module readout | ● |
| Preconfigurable by order | ○ |
| Operation and measurement software | |
| imc CANSASpro (via CAN-USB interface) | ○ |
| imc STUDIO (via imc BUSDAQ, imc CRONOS etc.) | ○ |
| Operation with 3rd party CAN logger | ○ |

imc CANSAS housing types

| | CANSAS [-L] | CANSAS-K | CANSAS-SL |
|--|-------------------|---------------|---------------|
| General | | | |
| Housing type | alu profile | cassette | sealed |
| Size (W x H x D, mm) | W x 111 x 90[145] | W x 128 x 145 | W x 113 x 152 |
| Weight (typ.: UNI8) | 800g | 450 g | 900 g |
| Stackable | ● | | ● |
| 19" Subrack mounting | (●) | ● | |
| Subrack slot recognition | (●) | ● | |
| DIN-rail mounting kit | ● | | |
| Versatile mounting kit | ● | | ● |
| Operating conditions | | | |
| Extended temp. range, incl. condensation | ● | ● | ● |
| Shock vibration rating | 50g pk (5 ms) | 50g pk (5 ms) | MIL STD810F |
| IP rating | IP40 | IP20 | IP65 |
| Connectivity | | | |
| CAN connector (in / out) | 2 x DSUB-9 | 2 x DSUB-9 | 2 x DSUB-9 |
| Power input connector | PHOENIX | PHOENIX | LEMO.1B |
| Control LED (front) | ● | ● | ● |



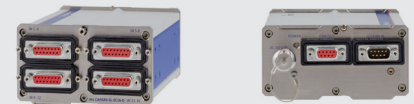
Standard aluminium profile housing (short) with DSUB-15 connectors shown



Standard aluminium profile housing (short) with thermocouple (type K)



Cassette module for 19" subrack mounting variant with PHOENIX terminal blocks shown



Sealed waterproof (IP65) SL-housing



Example of connector variants: High voltage HVC18 module with push-in (spring cage) terminals for direct thermocouple connection and banana jacks for voltage measurements

Example of connector variants: universal UNI8 module with individual LEMO.1B connectors



19" subrack for mounting of cassette type imc CANSAS modules: Backplane mainframe for user-configurable plug-in of modules with automatic slot recognition

TEDS Support (Transducer Electronic Data Sheet)
 imc CANSAS devices support direct read/write of TEDS sensors, including imc's TEDS Clip. TEDS interfaces require either the ACC/DSUB-TEDS-x variants of our connectors (2-wire TEDS), or per-channel connectors such as Lemo or ITT-VEAM.

Key: ● Default, ○ Optional, (●) Restricted

Analog measurement modules

| module name CANSAS-(L/K/SL)-xxx | size | | connector | housing variants | | | | speed | | voltage mode | | | | current | | temp | supply | bridge mode | | | | | | | |
|---|----------|------------------|-------------------|------------------|----------------|---------------|----------|-----------|----------------------------------|-------------------------|-----------------------|-------------------------|-------------------|----------------------|--------------------|---------------------|-----------------|-------------------|-------------|---------------|-------------|-------------|------------------------|------------------------|---|
| | channels | width (1 = 8 HP) | connector variant | TEDS | standard short | standard long | cassette | SL-Series | max. sampling rate (per channel) | signal bandwidth (-3dB) | isolated voltage mode | min. voltage range (mV) | voltage up to 10V | voltage up to 50/60V | voltage up to 800V | 20mA internal shunt | 20mA shunt plug | thermocouple (°C) | RTD (PT100) | sensor supply | full bridge | half bridge | quarter bridge 120 Ohm | quarter bridge 350 Ohm | |
| Voltage & temperature measurement | | | | | | | | | | | | | | | | | | | | | | | | | |
| C8 | 8 | 1 | DSUB-15 | ● | ● | ● | ● | 100 Hz | 20 Hz | | 2,5 | ● | ● | | | ● | ● | ○ | | | | | | | |
| C8-2T | 8 | 1 | Thermo | | | ● | ● | 100 Hz | 20 Hz | | | | | | | | ● | ● | ○ | | | | | | |
| C8-BNC | 8 | 1 | BNC | | | ● | ● | 100 Hz | 20 Hz | | 2,5 | | ● | | | | | | | | | | | | |
| C8-L | 8 | 1 | LEMO.1B | ● | | | | 100 Hz | 20 Hz | | 2,5 | ● | ● | | | (●) | | ● | ○ | | | | | | |
| CI8 | 8 | 1 | DSUB-15 | ● | | ● | ● | 1000 Hz | 440 Hz | ● | 20 | ● | ● | | | ● | ● | ○ | | | | | | | |
| CI8-2T | 8 | 1 | Thermo | | | ● | ● | 1000 Hz | 440 Hz | ● | | | | | | | ● | ● | ○ | | | | | | |
| CI8-L | 8 | 1 | LEMO.1B | ● | | | | 1000 Hz | 440 Hz | ● | 20 | ● | ● | | | (●) | | ● | ○ | | | | | | |
| CI8-BNC | 8 | 1 | BNC | | | ● | ● | 1000 Hz | 440 Hz | ● | 20 | ● | ● | | | | | | | | | | | | |
| SC16 | 16 | 2 | DSUB-15 | ● | ● | ● | ● | 500 Hz | 28 Hz | | 100 | ● | (●) | | | ● | ● | ○ | | | | | | | |
| SC16-2T | 16 | 2 | Thermo | | | ● | ● | 1 Hz | 0.5 Hz | | | | | | | | ● | ● | ○ | | | | | | |
| SC16-L | 16 | 2 | LEMO.1B | ● | | | | 500 Hz | 28 Hz | | 100 | ● | | | | (●) | | ● | ○ | | | | | | |
| SCI8 | 8 | 1 | DSUB-15 | ● | ● | ● | ● | 1000 Hz | 42 Hz | ● | 100 | ● | ● | | | ● | ● | ○ | | | | | | | |
| SCI16 | 16 | 2 | DSUB-15 | ● | ● | ● | ● | 500 Hz | 23 Hz | ● | 100 | ● | ● | | | ● | ● | ○ | | | | | | | |
| SCI8-2T | 8 | 1 | Thermo | | | ● | ● | 2 Hz | 1 Hz | ● | | | | | | | ● | ● | ○ | | | | | | |
| SCI16-2T | 16 | 2 | Thermo | | | ● | ● | 1 Hz | 0.5 Hz | ● | | | | | | | ● | ● | ○ | | | | | | |
| SCI8-L | 8 | 1 | LEMO.1B | ● | | | | 1000 Hz | 42 Hz | ● | 100 | ● | ● | | | (●) | | ● | ○ | | | | | | |
| SCI16-L | 16 | 2 | LEMO.1B | ● | | | | 500 Hz | 23 Hz | ● | 100 | ● | ● | | | (●) | | ● | ○ | | | | | | |
| SCI8-BNC | 8 | 1 | BNC | | | ● | ● | 1000 Hz | 42 Hz | ● | 100 | ● | ● | | | | | | | | | | | | |
| SCI16-BNC | 16 | 2 | BNC | | | ● | ● | 500 Hz | 23 Hz | ● | 100 | ● | ● | | | | | | | | | | | | |
| High isolating 800V CAT I, 300V CAT II | | | | | | | | | | | | | | | | | | | | | | | | | |
| HC18 | 8 | 2 | Push-in | | | ● | ● | 1000 Hz | 440 Hz | ● | 20 | ● | ● | | | ● | ● | ○ | | | | | | | |
| HC18-T-L | 8 | 2 | LEMO (HV) | | | ● | ● | 1000 Hz | 440 Hz | ● | | | | | | | ● | ● | ○ | | | | | | |
| HVC18 | 4 | 2 | Push-in Banana | | | ● | ● | 1000 Hz | 440 Hz | ● | 20 | ● | ● | ● | | ● | ● | ○ | | | | | | | |
| Bridge & strain gauge measurements | | | | | | | | | | | | | | | | | | | | | | | | | |
| DCB8 | 8 | 2 | DSUB-15 | ● | | ● | ● | 1000 Hz | 200 Hz | | 5 | ● | ● | | | (●) | ● | ○ | | | ● | ● | ● | ● | ○ |
| DCB8-L | 8 | 2 | LEMO.1B | ● | | | | 1000 Hz | 200 Hz | | 5 | ● | ● | | | (●) | (●) | ○ | | | ● | ● | ● | ● | ○ |
| BRIDGE2 | 2 | 1 | DSUB-15 | | ● | | ● | 5000 Hz | 1000 Hz | | | | | | | | | ● | ○ | | ● | ● | ● | ● | ○ |
| For universal use | | | | | | | | | | | | | | | | | | | | | | | | | |
| UNI8 | 8 | 2 | DSUB-15 | ● | | ● | ● | 1000 Hz | 200 Hz | | 5 | ● | ● | | | (●) | ● | ○ | | | ● | ● | ● | ● | ○ |
| UNI8-V | 8 | 2 | ITT-VEAM | ● | | ● | ● | 1000 Hz | 200 Hz | | 5 | ● | ● | | | (●) | (●) | ○ | | | ● | ● | ● | ● | ○ |
| UNI8-L | 8 | 2 | LEMO.1B | ● | | | | 1000 Hz | 200 Hz | | 5 | ● | ● | | | (●) | (●) | ○ | | | ● | ● | ● | ● | ○ |

Process control and specialties

| module name CANSAS-(L/K/SL)-xxx | size | | connector | housing variants | | | | speed | | features and operation mode | | | | | | | | | | | | | | | |
|---|----------|------------------|-------------------|------------------|----------------|---------------|----------|-----------|----------------------------------|-----------------------------|-----------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | channels | width (1 = 8 HP) | connector variant | TEDS | standard short | standard long | cassette | SL-series | max. sampling rate (per channel) | signal bandwidth (-3dB) | isolation | | | | | | | | | | | | | | |
| Pulse counter | | | | | | | | | | | | | | | | | | | | | | | | | |
| INC4 | 4 | 1 | DSUB-15 | | ● | ● | ● | ● | 1000 Hz | 500 kHz | | Modes: displacement, angle, events, time, frequency, velocity, RPM | | | | | | | | | | | | | |
| INC4-L | 4 | 1 | LEMO.1B | | | | | ● | 1000 Hz | 500 kHz | | x/y tracks + index = 9 tracks, 32 Mhz / 33 ns counter, optional supply | | | | | | | | | | | | | |
| Digital I/O | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI16 | 16 | 1 | DSUB-15 | | ● | ● | ● | ● | 10 kHz | | ● | Digital input: 2 galvanically isolated groups of 8 Bit | | | | | | | | | | | | | |
| DI16-PH | 16 | 1 | Terminal blocks | | | ● | ● | | 10 kHz | | ● | max. 500 µA input current | | | | | | | | | | | | | |
| DO16 | 16 | 1 | DSUB-15 | | ● | | | | 10 kHz | | ● | Digital output: 2 galvanically isolated groups of 8 Bit | | | | | | | | | | | | | |
| DO16-PH | 16 | 1 | Terminal blocks | | | ● | | | 10 kHz | | ● | configurable to open drain / totem pole mode, max. 0.7 A sink current | | | | | | | | | | | | | |
| DO8R | 8 | 1 | DSUB-15 | | ● | | | | 10 kHz | | ● | Relais output: Single-Pole-Double-Throw switches (SPDT) | | | | | | | | | | | | | |
| DO16R | 16 | 2 | DSUB-15 | | ● | | | | 10 kHz | | ● | | | | | | | | | | | | | | |
| Analog out, PWM | | | | | | | | | | | | | | | | | | | | | | | | | |
| DAC8 | 8 | 1 | DSUB-15 | | ● | ● | ● | ● | 5 kHz | 5 kHz | | Analog output: voltage/current (10V/20mA) individually configurable | | | | | | | | | | | | | |
| DAC8-BNC | 8 | 1 | BNC | | | | ● | | 5 kHz | 5 kHz | | and/or onboard calculations | | | | | | | | | | | | | |
| PWM8 | 8 | 1 | DSUB-15 | | ● | ● | ● | | 10 kHz | | ● | PWM output: 2 galvanically isolated groups of 4 channels | | | | | | | | | | | | | |
| SENT digital sensors, direct pressure, GPS | | | | | | | | | | | | | | | | | | | | | | | | | |
| SENT | 8 | 1 | DSUB-15 | | ● | | | | | | ● | SENT-CAN Gateway: (SAE J2716), individually isolated channels | | | | | | | | | | | | | |
| P8 | 8 | 1 | Tube | | | ● | ● | | | | | Integrated pressure transducers: absolute/relative, gas/liquid | | | | | | | | | | | | | |
| GPS | 1 | 1 | DSUB-9 | | ● | | | | | | | GPS 1 1 DSUB-9 GPS Receiver - CAN converter: for RS232 GPS mouse | | | | | | | | | | | | | |



imc Meßsysteme GmbH
Voltastraße 5
13355 Berlin
Germany

Tel.: +49 (0)30 - 46 70 90 26
Fax: +49 (0)30 - 463 15 76
hotline@imc-berlin.de
www.imc-berlin.com