Intelligent measurement modules for test stands and mobile applications
**imc CANSAS**

**CAN modules for test stand, vehicle and industrial applications**

Whether test stand, on-board vehicle application or industrial environment – when time synchronous, dynamic or decentralized acquisition of large channel counts is required: imc CANSAS modules are ideal. Equipped with 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 are output as CAN messages and can be read and recorded by any measurement, automation or control system with a CAN interface. imc BUSDAQ flexible is the perfect choice for CAN data logging: it can directly be connected with a simple click.

**Central or distributed installation**

In test stands or industrial environments, a centralized installation of the measurement system is often desired. imc CANSAS flexible modules are designed to fit into a special 19” subrack solution.

For widely distributed sensor assessment, the ability to capture and digitize signals near the sensor is quite advantageous. imc CANSAS modules can be placed directly next to the sensor and connected to a network with standard CAN cable – up to 1000m away. Important for mobile applications: imc CANSAS modules operate reliably in extended temperature ranges and withstand severe shock and vibration. imc CANSAS fit is particularly suited for harsh environments. With an IP65 rating, they are resistant to dirt, dust and splashing water.

**Intelligent functions make the difference**

All imc CAN modules are equipped with integrated signal processors that enable local real-time calculations of results, yielding data reduction and reduced bus load for highly productive testing. imc CANSASflex guarantees precise synchronization for all channels even across multiple modules: using CAN-based clock synchronization, imc CANSAS accomplishes sync 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, such as a control or automation system, can constantly monitor all involved modules. 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.
In Practice

Flexible in test stand applications
On test stands, adaptable and easy to integrate measurement hardware is required. The flexible, modular design of imc CANSAS is the ideal solution. From universal modules that can measure voltage, current, temperature or strain, up to special modules for pressure, high voltage or high isolation - the choice is yours. Depending on the task, the chosen measurement module can easily be plugged into the rack. This automatically powers the module and connects it to the CAN bus. Hot-Plugging allows modules to be added or replaced, even during operation.

Robust in mobile applications
Even under harsh environmental conditions in mobile applications, imc CANSAS modules measure precisely throughout a wide temperature range and can tolerate condensation from passing through the dew point. For operations in the engine compartment, the particularly compact and robust imc CANSAS/flex modules are well-suited and can work from -40°C to +125°C. These modules are built according to IP65 and MIL-STD-810F and tolerate dirt, splashing water, vibrations and shocks. Once configured, imc CANSAS systems automatically provide data when power is applied.

Distributed tests and measurements
For widely distributed measurement equipment, 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 cables 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 design, each measurement module can be placed close to the sensor. The acquired 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

**System design**

**The imc CANSAS product family**

imc CANSAS is designed for test and measurement tasks on test stands, industrial installations, vehicles and buildings. A variety of input and output modules cover the full range of electromechanical testing requirements. With three different module series and numerous specialty modules available, there is a suitable imc CANSAS product for every application and environment.

**The versatile imc CANSASflex series**
The imc CANSASflex series offers a wide selection of measurement modules, which cover all typical sensors and signals from heavy machinery, installations and vehicles. The modules can be installed in both a spatially-distributed arrangement or as a central unit. Combining modules couldn’t be easier: with the innovative imc click mechanism, the modules are electrically and mechanically connected to each other – without the need for tools or cabling. On test stands, in factories or plants, wherever multiple modules are permanently installed as one central unit for long-term testing, the use of a 19" rack is often recommended. This allows modules to be conveniently inserted with automatic supply and connection to the CAN bus.

**The compact imc CANSASfit series**
The imc CANSASfit series is distinguished by its particularly compact design and robust housing which provides reliable protection against splashes, dust and vibration. The module’s wide temperature range from -40°C to +125°C, allows for outdoor operation, as well as testing performed in climate chambers. Due to its small form factor, imc CANSASfit is ideal for testing in confined spaces, such as in the engine compartment or under a vehicle’s interior trim. The modules acquire typical analog signals such as temperature and voltage, but also rpm, displacement or velocity, as well as digital status information.

**The classic imc CANSAS series**
The classic series offers a wide range of modules for use with all typical measurement and control signals on the test bench, in vehicles and in industrial settings. With different housing designs, imc CANSAS can be optimally adapted to various testing environments: whether using a standard variant in a vehicle or a cassette module on a test stand or stationary structure.
Suitable modules for every task

**Universal**
Measurement modules for universal testing
* Voltage and current
* Thermocouples
* PT100
* Strain gauge / bridges
* Resistance

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

**Strain gauges & measurement bridges**
Precision strain testing
* Quarter-, half- and full-bridge
* 120 Ohm or 350 Ohm quarter bridge completion
* Integrated sensor supply

**Outputs**
Open- and closed-loop control
* Analog outputs +/- 10 V, 0 ... 20 mA
* Integrated function generator for, e.g., square wave, sawtooth, etc.
* PWM outputs with TTL and open-drain output stage

**Counter inputs**
Incremental encoder measurements for determining:
* Frequency
* RPM
* Velocity
* Position and angle
* Time

**Gateways**
Digital interfaces over CAN
* RS232 gateway for conversion to CAN
* SENT gateway with 8 inputs to connect SENT sensors and output their data to CAN

**Specialty modules**

**Temperature (HV)**
Highly-isolated temperature measuring
* Thermocouples on high common-mode voltage levels of up to 800 V
* E-mobility and hybrid applications
* Individual HV-suited sockets

**Pressure**
Integrated pressure sensors
* 8 pressure inputs of different types
* Absolute and relative pressure measurements
* Gases and liquids

**Quiecent & operating currents**
Auto-Range measurement from 50 nA to 50 A
* Two independent, isolated channels for current measurement with automatic range switching
* Wide measuring range up to 50 A
* High resolution down to 50 nA and 30 Bit effective range dynamics

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**Miniature measurement modules**
imc µ-CANSAS
* 1 channel modules for measuring voltage, temperature or strain
* Wide temperature range up to 120 °C
* Particularly light-weight and robust
* Also for DIN rail

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imc CANSAS family

General specifications and functions

<table>
<thead>
<tr>
<th>Function</th>
<th>flex / classic</th>
<th>fit</th>
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<tbody>
<tr>
<td>main features</td>
<td>full flexibility</td>
<td>universal, special</td>
<td>vehicle tests, under-floor*</td>
</tr>
<tr>
<td>Application</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mobile testing</td>
<td>★★★</td>
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<tr>
<td>test stand</td>
<td>★★★</td>
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<tr>
<td>laboratory</td>
<td>★★★</td>
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<tr>
<td>mobile machinery</td>
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<td>System</td>
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<tr>
<td>clickable</td>
<td>★</td>
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<tr>
<td>mechanically compatible logger</td>
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<tr>
<td>19&quot; rack</td>
<td>with slot detection</td>
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<tr>
<td>DIN-rail mounting kit</td>
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<tr>
<td>CAN terminator</td>
<td>internal, switchable</td>
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<tr>
<td>desktop compatible</td>
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<tr>
<td>rubber buffer</td>
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Signal processing

ADC, processing 24 Bit ★★★★★
CAN messages 16 Bit integer ★★★★★
32 Bit float ★★★★★

virtual channels min/max/mean, linearization math, filters, logic ★★★★★

sync heartbeats ★★★★★
CANopen ★★★★★
Flexible ★★★★★
configuration read-back freely programmable ★★★★★

user status LED freely programmable ★★★★★

Operating conditions

High temperature 85°C ★★★★★ 125°C ★★★★★
sealed IP40 ★★★★★ IP65 ★★★★★
Shock & vibration resistant MIL Standard ★★★★★
DC supply automotive ★★★★★
isolated ★★★★★

Connectors

I/O connectors DSUB-15 ★★★★★ LEMO.1B ★★★★★
custom (BNC, ITT-Veam...) ★★★★★
CAN + supply combi socket DSUB-9 ★★★★★ LEMO.0B ★★★★★
supply separate ★★★★★ LEMO.0B.302 ★★★★★

Portability

module types diversity ★★★★★ module types ★★★★★
iso isolation ★★★★★ isolated I/O ★★★★★
HV modules ★★★★★

TEDS plug & measure ★★★★★

Temperature temperature ★★★★★
current, 20 mA ★★★★★
pulse counter ★★★★★
DI ★★★★★
DO ★★★★★
analog out (DAC, PWM) ★★★★★
IEPE / ICP ★★★★★
pressure ★★★★★

Facts & Features

Legend:
- standard, ★ optional, (★) limited
- ideally suited, ★★★ well suited, ★★★★ suited

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