# imc BUSDAQ*flex*

compact • mobile • expandable



## Intelligent multi-bus data logger for field and vehicle buses

imc – productive testing

# imc BUSDAQ*flex*

## Efficient vehicle and measurement data acquisition

The imc BUSDAQ*flex* series is used to acquire measurement information from vehicle, railway and aviation buses. In the basic configuration, the system has two CAN nodes. Depending on the selected housing size, these can be extended up to twelve nodes for different field and vehicle buses. In addition to CAN, interfaces to LIN, FlexRay, ARINC, MVB, XCPoE and CAN FD are available. Furthermore, it is possible to connect additional protocols and buses via a programmable APPMOD interface with Ethernet or RS232 interface.

In addition to recording raw data streams and protocol channels, imc BUSDAQ*flex* also supports live decoding of individual channels as well as complex protocols such as CCP, KWP2000, XCP, OBD2, UDS, DiagOnCan, TP2.0 and GMLAN.

With versatile triggering possibilities as well as the internal real-time data processing, these compact systems prove to be much more than simple loggers. In addition to its low power consumption

and fast measurement readiness (in the millisecond range), this compact device also excels in robustness. With condensation protection and an extended temperature range, the imc BUSDAQ*flex* series can operate easily in extreme environments. Specifically, this means that operation is assured with interior module temperatures ranging from -40 °C up to +85 °C and up to 50g shock resistance when used in off-road testing.

The new data logger is perfectly complemented by the imc CANSAS*flex* series measurement modules. Thanks to the click mechanism, the modules can be directly attached to the logger without tools and cables. In a very short time, a complete measurement system that can synchronously record and store all data can be made from a pure field bus logger.

### imc BUSDAQ*flex* – at a glance

- Provides 2 to 12 CAN nodes depending on selected housing size
- Expandable to include interfaces for all common vehicle, railway and aviation buses such as CAN FD, LIN, J1939, FlexRay, ARINC, MVB, XCPoE, ...
- Handles a variety of protocols such as CCP, XCP, KWP2000, OBD-2, UDS, DiagOnCAN, ...
- Autonomous operation with self-start capability (wake-up on CAN)
- Trigger, real-time data processing, internal data storage
- Wide operating temperature range from -40 °C to +85 °C
- GPS position detection


Thanks to its lightweight, compact design, the imc BUSDAQ*flex* is ideal for vehicle testing.


In conjunction with imc CANSAS*flex*, distributed measurements can be carried out quickly and safely.

## imc BUSDAQ*flex* – ideal for mobile applications

## Your benefit – our goal

### Increase productivity
- Acquisition of machine and vehicle data from various bus systems such as CAN, CAN FD, FlexRay, LIN, ARINC, MVB, XCPoE, ...
- Compressed recording of raw data streams (dumps)
- Acquire individual channels via live decoding of bus information
- Supports ECU protocols such as CCP, KWP200, XCP, OBD2, UDS, DiagOnCan, TP2.0, GMLAN
- GPS connection for synchronous acquisition of position and speed data

### Easy set-up
- Support for common formats such as DBC and A2L
- User-friendly assistance in setting up bus parameters, as well as device configuration
- Redundant data storage within the device itself

### Data analysis in real time
- Real-time analysis in the device – results already during the measurement
- Wide selection of statistical and mathematical analysis functions
- Limit monitoring with user notification for measurement channels and real-time results

### Robust and compact
- Compact design for use in small spaces
- Operating temperature from -40 °C to +85 °C
- Device condensation in cold temperatures allowed
- EN 50155 and MIL-STD 810-F – shock and vibration resistant
- No loss of measurement data during power outage

### Autonomous and mobile
- PC-independent operation, as well as "black box" functionality for long-term use
- Built-in UPS buffering for follow up (data backup during shutdown)
- Decentralized network and synchronization capability with all imc measurement systems
- WLAN-, GPRS- / UMTS-capable: ideal for remote or inaccessible areas

# In Practice

### Fleet and vehicle testing

With fleet testing and in-vehicle testing, the fleets are always at different locations. Measurement data are recorded via CAN, LIN, FlexRay or CAN FD with the imc BUSDAQ*flex* multi-bus data logger. If the vehicle is switched off, the imc BUSDAQ*flex* unit goes into sleep mode. Starting of the measurement is triggered by opening the door, for example (wake-up on CAN). Within 200 ms, this CAN message starts a pre-configured measurement. At the same time, the imc BUSDAQ*flex* automatically connects to the Internet via UMTS/LTE. It is then possible to access any measurement device in the fleet from a PC. Any threshold violations are automatically reported, and a complete series of measurements can be quickly transferred to the cloud. Last but not least, remote parameterization of measurement devices is possible without any difficulty.
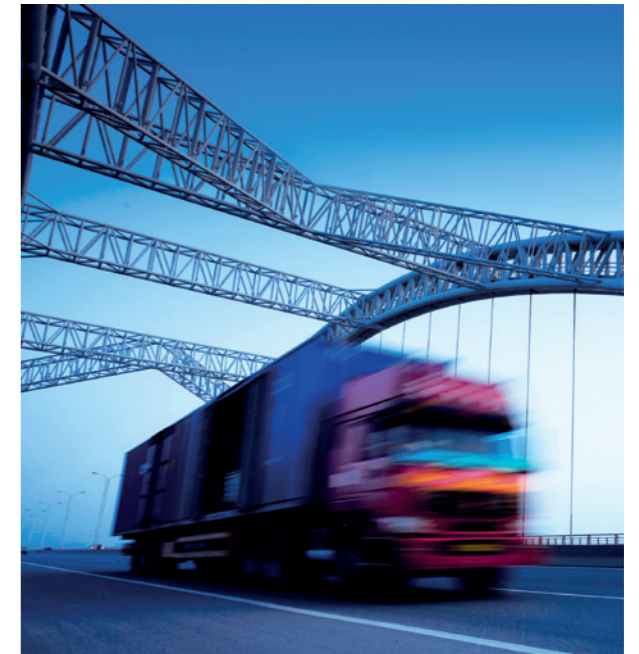
### Distributed testing on machinery and in facilities

Within large facilities or machinery, such as wind turbines, the individual measuring points are often far apart. A spatially-distributed measurement system has the distinct advantage that it can be placed close to the sensor. This reduces the amount of wiring and minimizes interference. With the imc BUSDAQ*flex* and imc CANSAS*flex*, you can create multi-channel measurement networks, even over long distances.
The modules are placed close to the measurement point and digitize the analog information into CAN signals direct on site. A wide range of modules covers all typical signals and sensors – from the universal measurement amplifier to special measurement modules for complex tasks such as highly-isolated measurements on hybrid and electric vehicles. imc BUSDAQ*flex* captures CAN data from the individual modules in a time-synchronous manner and stores them on an internal CF card or transmits them directly to your PC via Ethernet, WLAN or UMTS.
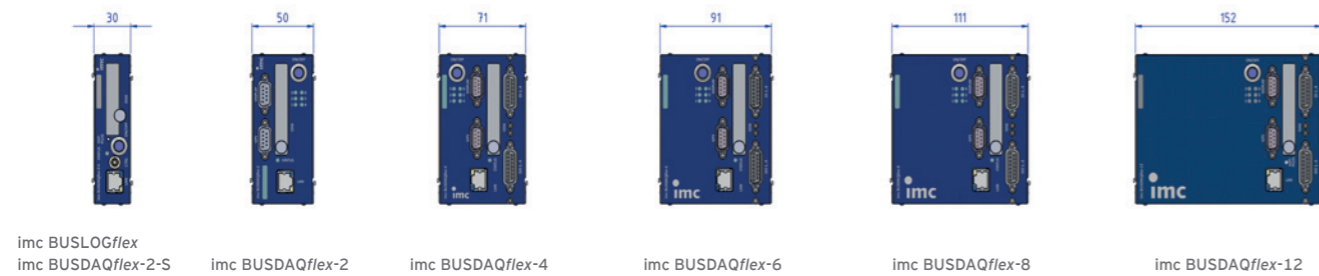
# Technical Data

## General facts & features

Key: ● default, ○ optional

| | imc BUSLOGflex & imc BUSDAQflex-2S | imc BUSDAQflex-2 | imc BUSDAQflex-4,-6,-8,-12 |
|---|---|---|---|
| **Operating conditions** | | | |
| Operating temperature | -40 to +85 °C | -40 to +85 °C | -40 to +85 °C |
| Shock vibration rating (pk over 5 ms) | 50 g | 50 g | 50 g |
| Protection rating (with opt. protective cover) | IP40 | IP40 | IP40 |
| **Data storage** | | | |
| Ring buffer memory | ● | ● | ● |
| Hard disk (internal) | | | ○ |
| CF card slot (Compact Flash) | ● | ● | ● |
| **Stand-alone capabilities** | | | |
| Autarkic PC-less operation, self-start | ● | ● | ● |
| Sleep/Standby, Wake-up-on-CAN | ● | ● | ● *1 |
| Remote-controllable main switch | ● | ● | ● |
| Programmable status display (LEDs) | | ● | ● |
| **Synchronization & clock** | | | |
| Master-slave between different imc systems | ● | ● | ● |
| Via external DCF-77 signal, IRIG-B signal | ● | ● | ● |
| Via external NTP signal | ● | ● | ● |
| Via external GPS | | ● | ● |
| **Power supply** | | | |
| DC input | 10 - 50 V DC | 10 - 50 V DC | 10 - 50 V DC |
| AC/DC adaptor (110 - 230V AC) | ● | ● | ● |
| Data integrity upon power failure | ● | ● | ● |
| UPS (Supercaps) | ● | ● | ● |
| Power consumption in sleep-mode | 200 mW | 200 mW | 200 mW |
| **Connectivity** | | | |
| Ethernet (100 MBit) | ● | ● | ● |
| WiFi adapter internal | | | ○ |
| Wireless UMTS, 3G, 4G (external) | ○ | ○ | ○ |

*1: only with pure CAN/LIN equipment

imc BUSLOGflex
imc BUSDAQflex-2-S | imc BUSDAQflex-2 | imc BUSDAQflex-4 | imc BUSDAQflex-6 | imc BUSDAQflex-8 | imc BUSDAQflex-12

## Inputs and outputs

| | imc BUSLOGflex & imc BUSDAQflex-2S | imc BUSDAQflex-2 | imc BUSDAQflex-4,-6,-8,-12 |
|---|---|---|---|
| **Bus interfaces** | | | |
| CAN nodes | 2 | 2 | 2 (max. 12) |
| Expandable | no | no | yes |
| **Supported expansion modules** | | | |
| CAN | | | ○ |
| CAN FD | | | ○ |
| LIN | | | ○ |
| FlexRay | | | ○ |
| J1587 | | | ○ |
| ARINC | | | ○ |
| XCPoE (Master, Slave) | | | ○ |
| MVB | | | ○ |
| Kistler RoaDyn | | | ○ |
| APPMOD (Ethernet/RS232/RS485) | | | ○ |
| **Inputs and outputs** | | | |
| Digital inputs | | | 4 |
| Digital outputs | | | 4 |
| Analog / digital in and outputs (via imc CANSASflex) | ○ | ○ | ○ |
| **Additional connections** | | | |
| GPS connection | | ● | ● |
| Display connection | | ● | ● |

## Software options

| Software product | Functionality | License-model | Included |
|---|---|---|---|
| **Operating software** | | | |
| imc STUDIO Standard | Operating software, integrated test &measurement suite | PC | ○ |
| imc STUDIO Professional / Developer | Customized operation, scripting, application development | PC | ○ |
| **Real-time data analysis** | | | |
| imc Online FAMOS *2 | Real-time calculations, immediate results | device | ○ |
| imc Online FAMOS Professional | Real-time control functions, PID controller, etc. | device | ○ |
| imc Online FAMOS Kits | Class counting (durability analysis), order tracking | device | ○ |
| **Post Processing** | | | |
| imc FAMOS Reader | Data visualization | PC | ● |
| imc FAMOS Standard / Professional / Enterprise | Data visualization, analysis, reporting, scripting | PC | ○ |
| **Remote Access** | | | |
| imc LINK | Remote device access, automatic data transfer | PC | ○ |
| imc REMOTE | Web Server, secure https device access | device | |
| **CAN** | | | ○ |
| Vector database | Vector database interface | device | ○ |
| ECU protocols | ECU Protocol support for CAN interface (KWP 2000, CCP, XCP, OBD-2, UDS, GMLAN, TP 2.0, DiagOnCAN) | device | ○ |
| **Applications development** | | | |
| LabVIEW™ VI's | LabVIEW VI-components | | ● |
| imc COM | ActiveX programming interface (API) | PC | ○ |
| imc API | .NET Programmierschnittstelle (API) | PC | ○ |

*2: not available for imc BUSLOGflex

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